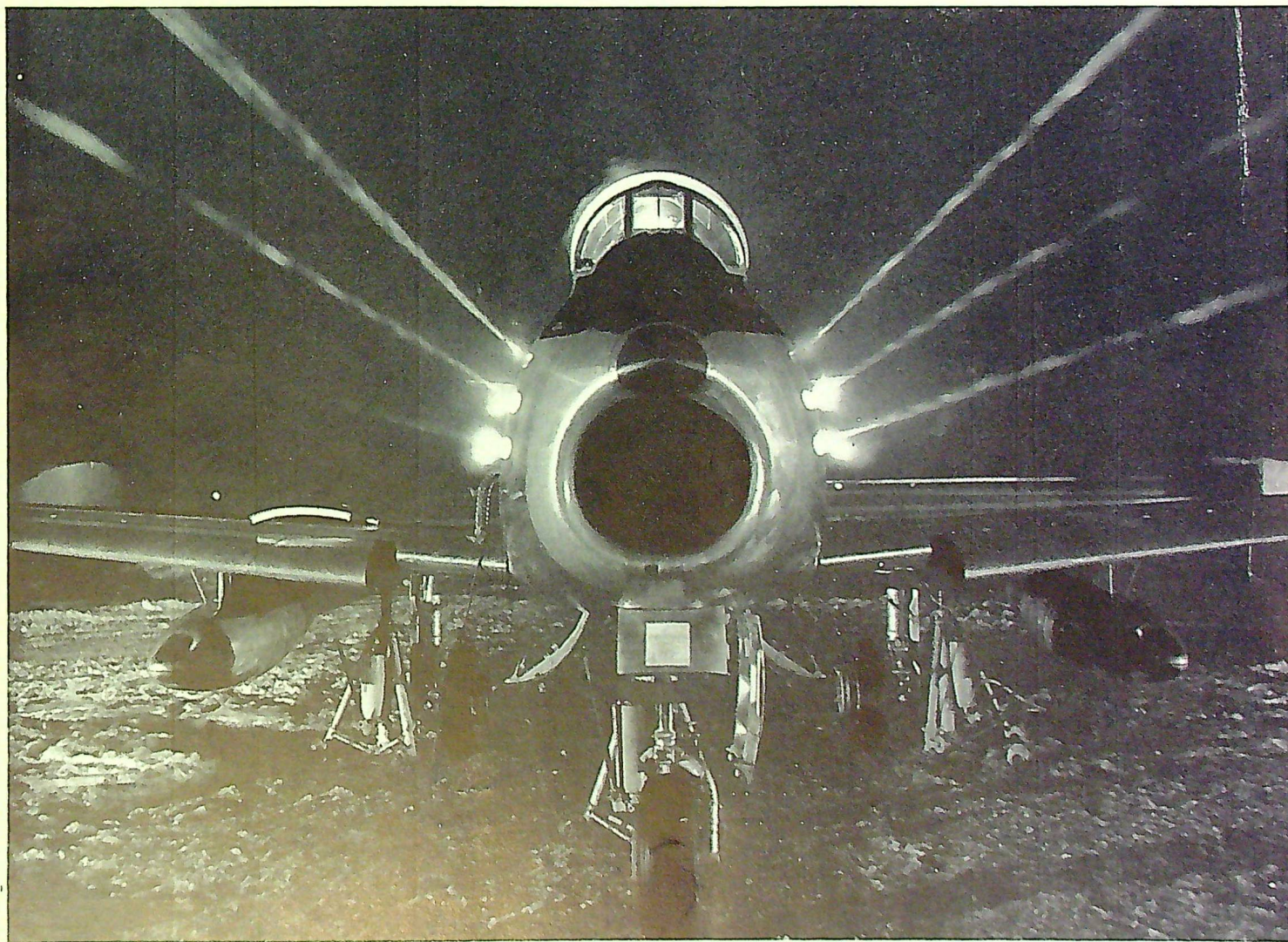


The **CROWNDDEL**

Vol. 5, No. 3
MARCH 1953



ROYAL CANADIAN AIR FORCE



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Royal Canadian Air Force

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This Month's Cover



A night-firing F-86 of the R.C.A.F. Central Experimental and Proving Establishment stares open-mouthed at a camera stationed just inside the twin paths of its tracers.

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

SGT. SHATTERPROOF HAS NO FEARS

Sir:

Once again the Nootka Nightingale has burst into song. I refer, of course, to my old friend Corporal Clam, whose immortal "Out of the Night Came Shatterproof" appeared in "The Roundel" more than three years ago. Much water has flowed through Pilchard Pass since then, but the flame of Clam's genius still burns like a beacon on that fog-enshrouded coast.

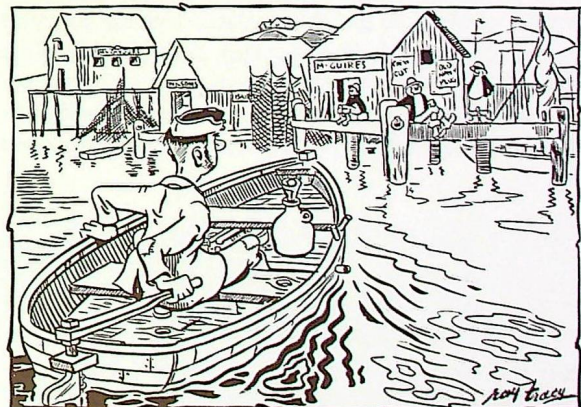
As I told you in the letter that accompanied the poem, Clam returned to B.C. after the war in order to take up his former profession of fishing. Not wishing to lose touch with the Air Force in which he had served with such distinction, he enrolled in the R.C.A.F. Association as a member-at-large. But his soaring spirit was not satisfied. In Clam, the instinct of the crusader was no less compelling than the divine afflatus of the poet. He must do more than just put on an Association hat and expose himself to "The Roundel" once a month. He determined that, as soon as he could get his engine going long enough to enable him to reach the mainland and discuss the project with B.C. Group Headquarters, he would form a Wing.

We shall never know, Sir, what agonies of frustration he endured during the two and a half years that followed. Try as he would, he was unable to keep his engine running for more than a few minutes at a time. Our only evidence of the bitterness he must have felt lies in the fact that those two and a half years mark the most barren period in his creative life. During them, the man who enriched Canadian literature with such masterpieces as "Spawning-Time at McGuire's Cannery" and "Hand Me My Rubber Trousers, Pal," produced only one poem of any consequence. A work of pure symbolism, it is perhaps the most haunting boat-song ever sung to the beat of oars

by a discouraged salmon-troller en route for Port Alberni's flesh-pots. It begins:

*Passed are the days of your childhood's dream—
Go, little Cohoe, go!
Wallow in silt till your bright scales gleam—
Show, little Cohoe, show!
Deaf to the sound of the tempest's scream,
Blind to the sun's infrequent beam,
Think of the prize that awaits upstream—
Roe, little Cohoe, roe!*

But Clam was not a man to give way to despair for very long. Last November he sent me a note (which I received a few days ago), advising me that he had made the supreme sacrifice and bought a new spark-plug. That was all; but from the enclosure that accompanied his terse announcement, we can deduce much. It consists of a single paragraph followed by a poem. Both are evidently intended for inclusion in the Association's section of "The Roundel," so I am forwarding them to you herewith. Together they constitute a saga of achievement seldom heard in this soft age.



Unprecedented in Association annals was the recent presentation of the R.C.A.F.A. Charter to Corporal Clam, President of B.C.'s new Sockeye Wing. Since the only approach to Wing Headquarters, which are at present located in the President's gutting-shack, lies through the perilous waters of Pilchard Pass, the Charter was wrapped in oilskin, introduced into a half-full keg of rum (ordered previously by the Chairman of the Entertainment Committee during his organizational visit to Group Headquarters), and dropped into the sea by a passing fish-packer. Thence it was picked up by the Chairman of the Ways and Means Committee (whose ignition-troubles now seem to have been permanently overcome) when the equinoctial gales had somewhat abated. It is regretted that the lack of a camera with a delayed-action shutter made it impossible to obtain any photographs of the executive body at the subsequent inaugural banquet, but it was unanimously agreed that the evening was a roaring success. The proceedings were brought to a close with a reading by the Guest Speaker of the following sonnet, composed by him in honour of the occasion.

CHARTER NIGHT IN PILCHARD PASS

Out in the mid-Pacific's lonely deep,
Where duodecapod and lamprey reign,
The mighty Sockeye, with convulsive leap,
Shoots to the surface, then turns home again.

What vision urges him? What dream persuades?
Falters that ardent spirit? Seeks he food?
Doth he recall some stream where fishy maids
Their countless ova tenderly extrude?

Not so! His phosphorescent trail he blazes
Until familiar cliffs about him rise;
Then on to his tail he rears and upward gazes
With throbbing gills and proud protruding eyes—

For there on the heights doth Corporal Clam display
The Charter of the R.C.A.F.A.

With men like Clam at the helm, Sir, I think we need have no fears for the Association's future.

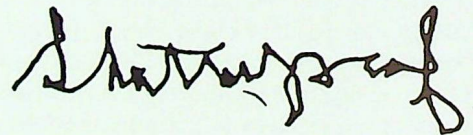
I would like to end this letter on the foregoing note of hope. But it may not be. Error, whether born of ignorance or committed by design, must not be allowed to go unchastised. Let me ask you to turn to page 5 of January's "Roundel." With what a soul-chilling statement are we there confronted! LAC Cumbersome, whose martyrdom to duty is said to have occurred some twenty years

ago, held in his hands a book entitled "*Queen's Regulations and Orders for the Royal Canadian Air Force*"! Are our souls so dead to loyalty, Sir, that we do not even know the genealogy of the British Crown? Or can it be that we have here yet further evidence of how little time means to those to whom the fate of our country has been entrusted?

But even though we might be willing to give them the benefit of the doubt on the above score, we cannot overlook the affront offered on page 47 to the Editor of Britain's "Air Mail." We make Mr. Blunt tell our readers that King George VI approved an Air Force Badge in 1923! If the prime purpose of "The Roundel," Sir, is the creation of international incidents, our magazine shows great promise of succeeding in its aim.

Let us pray that Mr. Churchill does not notice the third insult hurled at his country in the same shocking issue. In the sixth paragraph of page 14 it is asserted that Britain's War Cabinet "rather surprisingly" accepted an Admiralty proposal. What can such a remark imply except that the War Cabinet habitually obstructed the efforts of its Chiefs of Staff? When Britain's fleet comes sailing up the St. Lawrence, its million guns blazing retribution, it will be too late to explain to Mr. Churchill that what the Air Historian actually wrote was "the War Cabinet . . . accepted the (rather surprising) Admiralty proposal."

One can only suspect what dark motives underlie such seemingly innocent mistakes; but, Sir, whatever they be, let us have a care!



PROGRESS

When the electric power went off during a storm in Watertown, Wis., a farmer discovered that nobody on the place knew how to milk a cow by hand.

(*"New York Times"*)



ORGANIZATIONAL TRENDS IN AIR POWER

(The present article is a condensation and paraphrase of an address given by Air Commodore C. L. Annis, O.B.E., to the Canadian Club of Calgary during a lecture-tour made by him last October. Although it does not outline and clarify any specific course of action adopted by the R.C.A.F., nevertheless it belongs very definitely in "The Party Line" series. Indeed, in a limited sense, it may be regarded as the key to them all; for it is based upon the evolving concept of air power which sets the pattern to be followed, to a greater or lesser degree, by the makers of all Air Force policy. The author, who is now on course at the Imperial Defence College in England, has had an interesting Service career since he joined it as a pilot officer in 1936. From the outbreak of the Second World War until March 1944, when he was transferred to command one of No. 6 Group's stations in England, he was employed in anti-submarine operations off Canada's east coast, finishing this period as C.O. of Gander, Newfoundland. In the spring of 1945 he was posted to the R.A.F. Staff College, to return to Canada in the autumn as Chief Instructor at the R.C.A.F. Staff College, Toronto. In 1947 he was appointed Director of Operations at A.F.H.Q., a position which he left to become Director of the Joint Staffs. For the last few months prior to his present posting he served as Special Assistant to the C.A.S.—EDITOR.)

IN THE DAYS when the protagonist of air power was fighting for recognition in terms of air forces that would function as entities separate from armies and navies, the soldier and sailor put up arguments against him in the form of a conundrum which he found it difficult to answer for quite a long time — and, as a result, we airmen find that even today a surprisingly large number of people are not clear on just what is the fundamental *raison d'être* of air forces.

The soldier's conundrum went like this: "When I fire my artillery, I launch into the air projectiles

which arch over no man's land and cause destruction in or behind the enemy's lines. You airmen launch into the air aeroplanes which fly across the enemy's lines and fulfil the same purpose. It is true that your aeroplanes have much longer range than my artillery, but the principle of the thing is exactly the same. You do not question that artillery should be under the control of the surface forces. How then can you maintain that air forces should not also be under their control?" To this argument, the sailor merely added an extra barb. He said that by putting an aeroplane aboard a

carrier at, say, San Francisco and launching it for its attack close to the shores of Japan, he had, in effect, increased the aircraft's range by some four thousand odd miles.

I venture to suggest that, if it were put to some of us to find the flaws in this argument, we would be hard pressed to do so quickly. The argument is unbeatable, as long as it is expressed in terms of just one aeroplane. Unfortunately, as the airman soon found out by experience which the soldier and sailor did not immediately share, there were other aeroplanes in the sky — enemy aeroplanes. So eventually he evolved an answer to the conundrum. Said he to the soldier and the sailor:

“True, you launch your artillery projectiles into the air towards *the enemy's* territory, and if your projectiles should happen to meet an enemy projectile en route to *your* territory, no recognition occurs. It is just as though your troops and tanks and ships and the enemy's troops and tanks and ships decided to advance simultaneously and passed through each other's lines without recognizing each other as enemies, so that they just went blithely on to wreak their destruction with impunity. Now, when I launch my aeroplane into the air against targets behind the enemy's lines, an enemy aircraft is launched to meet it. Unlike projectiles, they do not meet and pass unheeding in the air. They turn inwards toward each other and a war of survival is fought *in the air*. One of the two aircraft is destroyed; and only the victor passes onwards to spread its destruction in or behind the enemy's lines. As a partial truth — and only as a partial truth — aeroplanes *are* like long-range artillery. But they are *not* like long-range artillery until a war has been fought in the air and victory has been won in the air — and, as far as all our experience to date has taught us and as far as we can see ahead into the future, *only air power can defeat air power*. Away out of reach of the soldier and the sailor, we must fight in the air for mastery of the air.”

(That this mastery is significant is perhaps best summed up in the words of Mr. Churchill. “For good or ill, air mastery is today the supreme expression of military power; fleets and armies, however vital and important, must accept a subordinate rank.”)

To the sailor, the airman merely adds: “I have broken your and the soldier's main argument. It is a partial truth that you have added perhaps 4,000 miles range to my aircraft; but you have also added to my aircraft 4,000 miles of risk from other ships and submarines (species to which I am normally immune) as well as from land- and ship-based enemies of my own kind. Only for very limited purposes can you justify the addition of these major risks for the gain of one advantage which today is not nearly so important to me. I have longer built-in range now; and, besides, I have had time to increase that range by the same organizational method that you used to gain much of yours. I have built a network of major bases around the world.”

Now, I hope that from this illustration of conundrum and answer the rôle of air power stands out more clearly. The first and basic rôle of air power is to destroy enemy air power and then to turn as quickly as possible, alone and with the other armed forces, to exploit the resultant situation.

I would like to add for the record that today no airman in his senses claims that the rôles of the land forces or of the navies are anything less than vital. That they perform their rôles successfully is, in most circumstances, vital to air power itself. But the winning of mastery in the air is a peculiarly important “first” and “must.” In the words of Marshal of the Royal Air Force, Lord Tedder, “In war, nothing on the surface of land or sea can operate effectively unless and until the situation in the air is under firm control, that is, until the air battle has been won.” As I said above, only the airman can do it, and that is why today we have an ever-growing number of nations which have given their air forces coequal status with their armies and their navies.

* * *

Oddly enough, the above trend can be very definitely classed under the heading of recent developments.

The United Kingdom was the first — and the only — nation during the First World War to give

her air force coequal status. That was in 1917. Italy was next, in 1925; then Sweden in 1926, Greece in 1931, and France in 1933. Germany followed in 1935, then Spain — in 1936, I believe. Canada and Australia, in 1938, were the last nations to follow suit before the outbreak of the Second World War. That brought the total to nine. Turkey, who was not a belligerent, converted her organization in 1944 — the only nation to do so during the 1939-1945 period. Then in 1946, Belgium, Norway, and the Netherlands, each established its air force as a coequal Service. The United States followed suit in 1947, thirty years after the United Kingdom. In 1950, Denmark became the sixteenth convert to the “new” idea, and in the present year Portugal did likewise. Six of these seventeen nations — and one of them the United States — have read the writing on the wall only in the last six years. Thus perhaps we can say with some considerable accuracy that the most striking organizational trend in the exploitation of air power has been the changes which have been made in national military organizations to accommodate the growth in air power status.

The air forces of many nations are still, comparatively speaking, quite young. Therefore many of the problems of youth — notably those of finding new clothes and homes when they have grown out of their old ones, and of seeking education on a general as well as on a purely professional basis — must occupy a greater measure of their time and effort than they do of the older Services'. Most air forces have never yet had a chance really to get their breath.

The process of bringing a completely new air force (such as the Royal Air Force at the time of its birth) to the maturity of a fully organized and integrated whole which is efficient at all levels, is a surprisingly lengthy process, extending perhaps over one entire military generation of twenty-five years. It is worth noting that the longer an air force has existed as a *fully integrated* organization, the better able it becomes to provide from *within itself* a quota of leaders properly groomed for the highest commands in all their wider aspects. It could be classed as one of the recent developments of air power that worthy candidates

for these extremely responsible posts have only begun to emerge in any quantity from air forces during the last few years. I would venture to suggest that this stage has been reached none too soon, in view of the extent to which air power dominates the military scene in this age — an age in which, be it remembered, our civilization and our way of life are gravely threatened.

Although those nations which have been laggard in establishing their own air forces as separate Services are able to profit from the experience and help of the older air forces, their growth into “early maturity” takes at least from ten to fifteen years. Meanwhile, the older air forces are having to carry a heavy extra burden.

* * *

An interesting and pertinent side issue on this question occurs in connection with the military organization of Russia and her satellites. It is a comfort, at least to us Western airmen, that the allocation and control of the air power of Russia and its satellites is still, in the main, divided up between their land and naval forces. The airman recognizes that under these conditions the Soviet cannot hope to reach its full potential; and our own experience has taught us how inescapably long a time Russian reorganization would take to become fully effective. It is not at all improbable that, because of the extent of the present East-West tension, Russia would not dare to make the change now, even if she wished to, because of the attendant dislocations, strains, and jealousies which would occur in her supreme commands. In fact, this very reluctance by Russia to change to a military organization which has proven so effective in the West may be a significant indication of how severely the cold war, and especially the threat of Western air power, is affecting her. In the United States the desirability of establishing her air force as a separate armed service became well and widely recognized early in the Second World War. But the United States could not risk the reorganization at that time. Instead, make-shift adjustments were improvised; and although this helped materially, the light of history shows that U.S. air



power could have proven far more effective if it had been in the same position of freedom and stage of organization as was the Royal Air Force in, say, 1936, or even in 1939.

* * *

It is often said by airmen that a typical air force conversation consists largely of unsupported statements followed by flat denials and, finally, by personal abuse! Whether or not this is true — and I must admit that it is not entirely untrue — I note that I have just made an unsupported statement when I said that we airmen realize that Russia cannot achieve her full air power potential as long as her air power is allocated between and controlled by her armies and her navies. I must therefore be more explicit.

The great danger to air forces, the danger that destroys air forces with greatest certainty, speed, and finality, is enemy fighters higher up in the air at any time. The airman does not turn his back on them very often or for very long, or they will murder him.

Now, flying in direct support of armies (or, for that matter, of navies) makes it necessary for the airman to do that very thing. It forces him to turn his attention away from an enemy who can quickly prove decisive. In coming down for thousands of precious feet in order to engage a brand new enemy on the surface (and, be it added, an enemy who can take a significant toll with automatic anti-aircraft fire), the airman is in precisely the same position as a sailor who is required to sail his ships between an undefeated enemy fleet and the shore in order to engage dangerous shore batteries. The airman might, in fact, just as reasonably ask the soldier to turn his back on his main enemy and deliberately engage in a two-front war. In either case it would be the quickest way of writing off a navy or an army — and most people would understand this immediately. What they might not — and, indeed, seldom do — understand quite so readily, is that the airman, in *his* element, obeys no less inviolable laws of position.

Yet surely it must be apparent that the segment of air power which descends to make a ground

attack not only lessens the number of those which can stay up top, but adds further to their burden by forcing them to divide their attention while performing the rôle of top cover. If the aircraft which go down to make the ground attack are specialized for this task, they can never rise to the height where the decisive air battles take place and where only the cream of air fighting-vehicles live to return another day. Despite the airmen's sincerest pleadings, the soldier and the sailor, in a general sort of way, have always had trouble remembering this truth in their hour of stress. As a result, today we see the Russian air forces heavily emphasizing types of aircraft suitable for ground attack. Fifteen years ago the German Wehrmacht forced such a course, but the Stukas disappeared very abruptly from the skies once they came into contact with real fighters, and the German High Command worked frantically and belatedly to produce fighters to replace them.

* * *

In looking back over the last fifteen years, I draw the personal conclusion that probably the greatest organizational phenomenon in air power has been the innovation and fashioning of air defence into a system which may be labelled as a "true entity." An air defence system, in its simplest terms, is merely an organized means of ensuring that the aeroplane projectile, in the analogy used earlier in this article, is not allowed to complete its flight into or behind our lines without having won that privilege in terms of victory in an air battle. The means of creating an *offensive* air system — or, as we now call it, a "strategic air offensive" — was born and brought into being in the First World War; but the means of creating an effective strategic air *defence* system was hardly possible until radar had been perfected at least to an employable extent — around 1935. Thereupon the marriage of air power to electronics was hastily performed at a sort of shotgun wedding, with the German Air Force standing ominously outside the church; and, soon after, the birth of an air defence system as an entity took place. The child grew fast during the

Second World War, and, together with its older brother, the strategic air offensive, has been growing very steadily ever since. Thus we now see, in the strategic air offensive and the strategic air defensive system, the two major divisions of air power; and the major organizational structure of air power is built along those lines. In addition, there exist other, and very important, ancillary aspects of air power, each organized as identifiable entities or functions. These are three in number: tactical, which is the military name for direct support of ground forces; maritime, which is the name for direct land-based support for naval forces; and air transport, whose name adequately describes its function.

One of the easiest ways to look at the general organizational trends of air power is to take a quick glance at its deployment.

The land masses of the world are divided politically into two "halves," with the line of abutment running right around the northern hemisphere across the Arctic, following the coastline of Asia, and biting a right-angled segment out of north-eastern Europe. Therefore strategic defensive air power is aiming strongly at the building of "base systems" all along this line — in depth, and on both sides of it wherever the paths of inbound strategic air offensive forces seem likely to cross it. Meanwhile, the strategic offensive base system has pushed up, all around the world, as close to this line as is practicable or possible, in order to be within striking-distance of critical strategical targets and at the same time to find some measure of protection for the strategic offensive bases themselves.

In the heartland of each of these two huge areas lies an inner area of air defence systems surrounding the industrial centres as well as the huge manufacturing, outfitting, and overhauling centres of the strategic offensive forces.

Along critical sections on the fringes of the two half-worlds lie the deployed ground forces, facing

each other and not too far apart. Near the ground forces are spread out the tactical air forces, partially augmenting but largely lying under the cover of the strategic air defence forces. In between — for our Western forces only, of course — our navies and our air forces have the task of keeping our lines of communication open so that sea and air transport may safeguard both the fringes and the heartlands from starvation.

I would like to add one more thing to the foregoing rough sketch of the deployment and general organization of air power. Because of complexities, weights, specializations, and so on, of air power's equipments and personnel complements, the base system itself has become very immobilized. Air forces are themselves more mobile than ever — *but only between prepared bases*. The base system has become indispensable to air forces in very much the same way as it became indispensable to navies in years gone by. Now the bases themselves are taking on the character of vested national and international interests; and because of their importance to air power — and even more because of the vital importance of air power itself — are themselves competing as areas and zones deserving strategic defence by all forces.

* * *

The deployment and organization of air power, as they stand today, represent the latest and (from a military viewpoint) probably the most effective steps that mankind has taken during this century towards military security. They do not, admittedly, represent progress in the direction of the only real and permanent security that can exist for mankind — a world-wide willingness to settle our international disagreements without armed conflict. That, of course, is the goal towards which we must all unceasingly strive; but until moral advancement begins to catch up with material advancement, we men of the military must continue to be as efficient as we know how.



Dactyloscopy

The Science of Finger-printing

By Squadron Leader B. L. Bower,
Directorate of Air Force Security.

(The author of this article, who is the officer in charge of the Canadian Armed Forces Identification Bureau, joined the R.C.A.F. in 1942, after several years as a finger-print expert with the R.C.M.P. Originally in charge of the R.C.A.F. Personal Identification Bureau, he assumed his present position upon the formation of the C.A.F.I.B. in April 1947. During the past eleven years there have passed beneath his unrelenting eyes the impressions of over 1¼ million Service and civilian personnel. — EDITOR.)

AN INTRODUCTION TO FINGER-PRINTING

THE Canadian Armed Forces Identification Bureau, located at N.D.H.Q., Ottawa, is a Joint Service organization staffed by an establishment of fifty Navy, Army, Air Force, and civilian personnel. It is responsible mainly for the security identification requirements of the Department of National Defence. In addition, it provides, by special arrangement, identification services for numerous other Government Departments, such as the Department of Labour (Great Lakes Seamen), Department of Defence Production, Canadian Arsenals, National Research Council, Atomic Energy of Canada Ltd., Department of National Health and Welfare, and the National Film Board.

The Bureau has undertaken considerable security research work and has developed special photographic and dactyloscopic procedures (to suit the needs of National Defence) for which patent applications have been filed. In particular, a new method of dactyloscopic classification for plain arch patterns has been developed for this department. It has constituted possibly the major

advance in finger-print classification since the first system was evolved some fifty years ago.

Usually referred to by the layman as "finger-printing," dactyloscopy is a subject which attracts considerable curiosity yet is very little understood by most people. For those who are interested, an effort will be made in the following article, in language the layman can understand, to throw some light on this interesting subject.

Dactyloscopy is the process of human identification through a study of the characteristics of the friction ridges of the palms and fingers of the hands and the soles and the toes of the feet. Its purpose is to fix the human personality, to give to each being a definite individuality — durable, unchangeable, always recognizable, and easily demonstrable. Dactyloscopy is often involved in juridical problems that emanate from proof of personality or human identity. It prevents the deeds or misdeeds of one man from being attributed to another. It is a guarantee to each individual of the enjoyment of that which belongs to him — though not of what belongs to another. In short, it safeguards social, financial, and legal rights, plus individual liberty.

Personal identification is the most frequent and fundamental act of social life, for individualization and recognition are the basis of our social organization. When two men are introduced to each other, which is the most common social act, each states his name as an individualizing attribute, as a means of distinguishing his person. From the earliest annals of history it would appear that personal identification of some character has been in vogue. Members of one savage tribe were distinguished from those of another by distinctive attire or even bodily decorations, such as scars, resulting from self-inflicted cuts or burns. In earlier civilizations, differences in dress of various social classes were clearly defined, sometimes by law, but more often by the sanction of custom. The branding of criminals and slaves was also practised at a time when no other method of identification was known. Various forms of tattooing were used by the Romans to identify mercenary soldiers and thereby to discourage desertion. In our present civilization some tradesmen or craftsmen still wear distinctive attire, while the armed forces of various nations are readily identified by uniforms. These are all forms of personal identification, and are so commonplace that their significance may remain unobserved unless called to our attention.

Examine the inside surfaces of your hands and fingers and you will observe friction ridges. The reason for these friction ridges is not altogether clear, but it is believed that they perform definite functions. For instance, they reinforce the surface of the skin, thereby making it more resistant to wear and tear. Corrugated cardboard, corrugated iron sheets, and automobile tires perform the same functions. Furthermore, better friction is secured by increasing the area in contact with an object, and the person's grip is thereby improved. This principle is used in non-skid tires. Finally, the perspiration ducts, being raised, are able to function more freely, and thus provide better lubrication.

The durability, unchangeability, and variability of friction ridges had to be demonstrated before their identification value could be established. All these factors have been unequivocally proven.

Friction ridges are discernible about three months before birth, and remain apparent until putrefaction sets in after death. However, friction ridges were still identifiable on the bodies of North American Indians, which, after being buried for several hundred years, were recently unearthed at Warren, Charlestown, and Rhode Island. The same can be said about the bodies of prehistoric Indians which have been exhumed in the caves of Southern Utah. This remarkable state of preservation was probably due to sun-drying, the high elevation of the graves, the dry climate, and the fact that the bodies were liberally smeared with red paint.

It has been established by Dr. Henry Faulds and Sir Francis Galton that friction ridges do not change during the life of an individual. The size of the ridges becomes larger as the child grows, but the ridge characteristics remain unaltered. No successful or practical method of altering finger friction ridges by surgery or grafting has been developed.



Friction ridges can be damaged, altered, or destroyed, if the injury is deep and extensive enough to destroy the sweat glands, but usually sufficient characteristics remain to effect an identification. Also, although numerous attempts have been made, no successful method of forging finger-prints has been developed to date.

The question of whether there was a sufficient variety of ridge characteristics to ensure that no two finger-prints could ever be identical has produced some interesting observations. Nature never produces objects that are identical. No two wings of a mosquito, leaves of a tree, or blades of grass appear the same under a magnifying glass. Even a pair of man-made articles, though they may appear to the naked eye to be identical, under microscopic examination are usually found to be different.

Similarly, two identical finger-prints from different fingers have yet to be discovered. While such a contingency is possible, it is not probable. Galton once calculated that the chances of two finger-prints being exactly alike were one in 64 billion, which was the earliest and lowest estimate. Later, Balthazard and Semour conservatively estimated a number composed of several figures followed by 64 ciphers and numerals. However, a poroscopic examination of the impressions with a microscope would indicate additional sweat pore characteristics that would multiply even these figures by a fantastic amount. So, for practical purposes, the chances of two prints from different fingers being exactly the same may be said to be mathematically incalculable.

In passing, it should be mentioned that most animals, including anthropoids and birds, possess friction ridges, and can be individually identified.

Eugenic and racial characteristics are apparently not indicated to any great extent by friction ridges, so far as incomplete research to date can determine. An anthropoid's finger-print cannot be distinguished from a human finger-print, which fact in itself may constitute a genetic link. However, some interesting genetic research work in dermatoglyphics is proceeding at the present time. The Chinese people, as a race, appear to possess a greater proportion of whorl patterns than the

Caucasian races. Also, certain types of people possess a larger percentage of arches.

Similar finger-print patterns are sometimes handed down from parents to their children. Identical twins, especially, often possess, through heredity, finger-print patterns so similar that, to an uninitiated layman who has no magnifying glass, their prints may appear to be exactly alike. Such, however, is not the case; their prints are not identical.

Consider, for example, the cases of three sets of R.C.A.F. twins, who, when they were simultaneously posted to Trenton in 1947, created a triple-threat conundrum for the personnel of the station. They were Flt. Lts. A. A. Sherlock, D.F.C., and E. T. Sherlock, D.F.C.; Flt. Lts. D. Warren, D.F.C., and B. Warren, D.F.C.; and Flt. Lt. C. C. Lee and Flying Officer M. D. Lee. To the layman, their corresponding finger-prints appear, in many instances, to be as identical as their faces, even on close examination. However, to an expert "dactyloctopus," this is not so; their finger-print classifications are all different.

The Sherlock twins.



Name: **SHERLOCK Eric Thomas** Classification: **M 1 U 001 12**
 No. **1011** Sex: **MALE** Reference: **S 1 U 011 8**

| | | | | |
|------------|-----------------|------------------|----------------|-------------------|
| RIGHT HAND | | | | |
| 1. Thumb | 2. Index Finger | 3. Middle Finger | 4. Ring Finger | 5. Little Finger |
| 16 | 10 | 14 | 13 | 12 |
| LEFT HAND | | | | |
| 6. Thumb | 7. Index Finger | 8. Middle Finger | 9. Ring Finger | 10. Little Finger |
| 11 | 10 | 9 | 13 | 8 |

Imprints taken by: *Richard G. Lee* Date: **MAY 27, 1942** Non-identification: *E. J. Sherlock, Ph.*

COMPLETED **211400**

Name: **SHERLOCK Allan Arthur** Classification: **M 9 Uc 000 17**
 No. **1011** Sex: **MALE** Reference: **M 1 U 011 11**

| | | | | |
|------------|-----------------|------------------|----------------|-------------------|
| RIGHT HAND | | | | |
| 1. Thumb | 2. Index Finger | 3. Middle Finger | 4. Ring Finger | 5. Little Finger |
| 16 | 12 | 11 | 0 | 17 |
| LEFT HAND | | | | |
| 6. Thumb | 7. Index Finger | 8. Middle Finger | 9. Ring Finger | 10. Little Finger |
| 13 | 12 | 10 | 11 | 11 |

Imprints taken by: *Richard G. Lee* Date: **MAY 27, 1942** Non-identification: *E. J. Sherlock, Ph.*



The Warren twins.

Name: **REGAN, Douglas** Classification: **S 1 R 010 8**
 No. **1017** Sex: **Male** Reference: **S 1 R 010 8**

| | | | | |
|------------|-----------------|------------------|----------------|-------------------|
| RIGHT HAND | | | | |
| 1. Thumb | 2. Index Finger | 3. Middle Finger | 4. Ring Finger | 5. Little Finger |
| 14 | 12 | 10 | 15 | 8 |
| LEFT HAND | | | | |
| 6. Thumb | 7. Index Finger | 8. Middle Finger | 9. Ring Finger | 10. Little Finger |
| 18 | 6 | 11 | 12 | 9 |

Imprints taken by: *Douglas Regan* Date: **June 27, 1941** Non-identification: *Douglas Regan*

REGULAR **89550** **9J**

Name: **REGAN, Bruce** Classification: **M 9 Rc 110 9**
 No. **1017** Sex: **Male** Reference: **M 9 Rc 110 9**

| | | | | |
|------------|-----------------|------------------|----------------|-------------------|
| RIGHT HAND | | | | |
| 1. Thumb | 2. Index Finger | 3. Middle Finger | 4. Ring Finger | 5. Little Finger |
| 14 | 5 | 10 | 0 | 9 |
| LEFT HAND | | | | |
| 6. Thumb | 7. Index Finger | 8. Middle Finger | 9. Ring Finger | 10. Little Finger |
| 13 | 5 | 8 | 14 | 11 |

Imprints taken by: *E. J. Sherlock* Date: **June 27, 1942** Non-identification: *Bruce Warren*

First, let us examine the Sherlock prints. It will be noted that there is a certain degree of similarity between all their finger-prints except numbers 4, which are quite different. On the other hand, observe the marked similarity between prints number 9.

The Warren prints show most interesting similarities, especially in their border-line types and cores. Prints 1, 4, 5, 7, 8, 9, and 10, are surprisingly similar, but a big difference in the ridge slopes of the middle fingers is readily apparent.

Although the Lees have different finger-print classifications, their pattern types with respect to fingers 1, 2, 4, 5, 6, and 9, are the same, and there is a definite similarity in general pattern configuration and ridge characteristics. The ridge counts and whorl tracings are the same or nearly the



The Lee twins.

same. There is, however, no similarity between fingers 3, 8, and 10.

ANCIENT HISTORY OF DACTYLOSCOPY

The oldest recorded finger-prints were found carved in subterranean caverns and passage ways on the small island of Gavriani, off the northern coast of France. They date from the Neolithic Age, which authorities place anywhere from 30,000 to 100,000 years ago.

The prehistoric cave-men of Nova Scotia also left finger-prints carved on cave walls. Notable among such relics is a hand carved on a rock in Nova Scotia near Kyemovic Lake. This example shows palm and finger patterns.

The caves of the Spanish Pyrenees are noted for frescoes made by Neanderthal man, and these paintings are full of representations of the human hand and foot.

Australia and other continents, including Mexico and Central America, can show similar digital specimens dating back to prehistoric ages, proving that man has long been aware of the peculiar markings of friction ridges.

Coming to more modern times, the British Museum, in 1925, sent an expedition into Chaldea, which discovered, among other things, a well of clay brick. Many of the bricks in this well were marked with the original artisans' finger impressions in such a way as to leave little doubt that the prints were intentional. These may be the oldest

| | | | | | |
|----------------------------|---------------------|-----------------------|--------------------|-----------------------|------------------------------------|
| Name: LEE CALVIN GUSTAFSON | | | | | Classification: S 28 W 1c |
| No.: | | | | | Reference: S 2 U |
| Sex: MALE | | | | | Reference: |
| RIGHT HAND | | | | | Little Finger: J |
| 1. Thumb: 10 | 2. Index Finger: 1 | 3. Middle Finger: 11 | 4. Ring Finger: 0 | 5. Little Finger: 13 | |
| LEFT HAND | | | | | Little Finger: J |
| 6. Thumb: 10 | 7. Index Finger: 9 | 8. Middle Finger: 1 | 9. Ring Finger: 1 | 10. Little Finger: 1 | |
| Date: 1927-10-15 | | | | | Signature of subject: [Signature] |
| Date: 1927-10-15 | | | | | Signature of examiner: [Signature] |
| 15U | | | | | |
| Name: LEE EDWIN DORRY | | | | | Classification: M 25 W 17 |
| No.: | | | | | Reference: S 12 L |
| Sex: MALE | | | | | Reference: |
| RIGHT HAND | | | | | Little Finger: J |
| 11. Thumb: 15 | 12. Index Finger: 1 | 13. Middle Finger: 1 | 14. Ring Finger: 0 | 15. Little Finger: 15 | |
| LEFT HAND | | | | | Little Finger: J |
| 16. Thumb: 11 | 17. Index Finger: 0 | 18. Middle Finger: 12 | 19. Ring Finger: 1 | 20. Little Finger: 17 | |
| Date: 1927-10-15 | | | | | Signature of subject: [Signature] |
| Date: 1927-10-15 | | | | | Signature of examiner: [Signature] |
| LEFT HAND | | | | | |
| RIGHT HAND | | | | | |

known voluntarily-recorded finger-prints made for identification, as the well was built in 2,800 B.C.

Sometimes the ancient Egyptians required tax-collectors to place their own finger-prints and those of the persons making payment on an official clay tablet receipt form. Similar clay tablets have been found in the ruins of the ancient Nineveh. Also, government officials, when making arrests, were required to produce for the inspection of a higher official the finger-prints of the persons arrested, in order to show that they had arrested the right person.

Eight miles from Jerusalem, pottery containing the finger-prints of the same manufacturer was found in three different ruins, one above the other, indicating that the same pottery had survived the destruction of three different cities.



There is evidence that the Chinese have used finger-prints since earliest recorded history, as seals, signatures, and means of identification. One of the earliest instances of their use for sealing purposes concerned Emperor Te'In Shi, who, from 246 to 210 B.C., used a finger-print seal carved out of white jade. As a convenient method of making signatures, the Chinese often placed finger-prints on official documents such as divorce contracts, loan contracts, and deeds of sale. Chinese mothers, not to be outdone, were familiar with the finger-prints of their children as a means of recognition. This practically constituted finger-printing on a nation-wide scale. Again, children in foundling asylums were finger-printed for identification purposes. Finally, there is reference to the use by Chinese of plastic finger-prints in the identification of criminals with the scene of the crime.

Just how much the ancients really knew about the identification value of finger-prints is questionable. The whole business was mixed up with religion and the mystic laying-on of hands. Although it did seem that Egyptians and Chinese understood and used the science of identification by finger-printing, there is no evidence that they developed a method of classifying them. It was not until recent times that the full identification value of finger-prints was realized and a classification system was devised.

MODERN DEVELOPERS OF DACTYLOSCOPY

Professor Marcello Malpighi, while lecturing in anatomy at the University of Bologna, Italy, in 1686, alluded to the characteristics of friction ridges.

J. E. Purkinje, a German professor, devised a system of delineating finger-print patterns in 1823.

Sir William Herschel, Chief Administrative Officer in the Hooghly district of Bengal, India, utilized finger-prints from 1860-1880 to identify government employees, pensioners, and prisoners, and to prevent impersonation and repudiation. He used them chiefly to avoid fraudulent payment of monies to persons not in his employ and to prevent any one employee from being paid more than once in each pay period.

Dr. Henry Faulds, an English physician at Tyskye Hospital, Tokyo, in 1880 established as facts both the great diversity of finger-print patterns and their unchanging nature during life. He also devised the system of taking finger-prints with printer's ink, the method which is used today.

Sir Francis Galton, in 1892, established the fact that apparently no two finger-prints of different persons could be found that were identical. Thereupon he set out to devise a system of classifying and filing.

Sir E. R. Henry, in 1900, using Galton's system as a basis, worked out and perfected the Henry system of classifying and

filing finger-prints. The following year he installed the system at Scotland Yard. His method is still the basis of all systems used in English-speaking countries today.

THE DEVELOPMENT OF FINGER-PRINTING IN NORTH AMERICA

1882 — Gilbert Thompson, of the United States Geological Survey, used a surcharged signature over his thumb impression to prevent the forgery of commissary orders.

1903 — The Prison System of New York State and the Department of Correction at Albany instituted finger-print identification, followed, in 1904, by the St. Louis, Missouri, Police Department and the Leavenworth Penitentiary.

1911 — The R.C.M.P., Ottawa, adopted a system of finger-printing forms in criminal investigation.

1924 — The Federal Bureau of Investigation, Washington, D.C., was inaugurated.

16 January 1941 — The R.C.A.F. Identification Bureau was formed. It is believed that by its formation an historical precedent was set, in that the R.C.A.F. was the first armed service in the British Empire to institute identification by finger-prints.

27 May 1941 — The Canadian Naval Service Identification Bureau was initiated.

2 September 1941 — The Canadian Army Identification Bureau was formed.

1 August 1944 — The Navy and Army Bureaus were amalgamated.

17 April 1947 — The Canadian Armed Forces Identification Bureau was inaugurated upon the amalgamation of the Navy-Army and R.C.A.F. Bureaus.

CANADIAN ARMED FORCES IDENTIFICATION BUREAU

As previously stated, the main function of the C.A.F.I.B. is to provide security identification for the Department of National Defence. In providing these services, a Central Bureau is maintained at N.D.H.Q. which houses 1,280,616 finger-print files of past and present Service and civilian members of the armed forces, and 1,497,776 photo files. Between 31 March, 1951 and 1 April 1952, the C.A.F.I.B. photographed 90,636 subjects, finger-printed 45,438 persons, issued 75,714 new-type identification cards and 14,922 miscellaneous identification cards, and produced about 366,000 photo enlargements for documentary files, etc. In addition, special identification cards and passes were produced for the Royal Tour and the N.A.T.O. Conference in Ottawa. A total of forty-eight field identification units are now maintained in Canada and Europe, a number which is being increased this year. Numerous other important functions have been performed that are not within the scope of this article to describe.

First Atlantic Crossing

By Eric Nicol

(Reprinted by courtesy of the "Vancouver Daily Province")

IF you have never flown the Atlantic you may be a bit nervous about it. But I can assure you that the only dangerous part of the trip is the taxi ride from Montreal to Dorval airport. Montreal cab-drivers are a thrifty lot who try to save rubber by travelling on two wheels. But if you reach the airport you're home free. The Atlantic is a piece of cake.

The first leg of my flight was from London to Montreal (every flight has several legs, the most interesting of which belong to the stewardess). When I showed up at the TCA terminal on Buckingham Palace road I was, I admit, a little on edge. I was half an hour early, and soon the men's washroom and I were old friends. In fact I was down there busy shivering when the loudspeaker called my flight. But for the quick thinking of the washroom attendant, who managed to pry my fingers off the water pipe, I would have missed the bus to the airport.

At London Airport I had a chance to study my fellow passengers in the TCA waiting room. Two of them were nuns, chattering gaily. They could afford to. I tried to find somebody with a less blameless life that I could share my jitters with. Every one looked calm and ready, including two small English boys, brothers, of about six and nine. I was to be cabined with a flock of innocents. I could picture the rest of the passengers rising, after the crash, in a shimmering squadron to Heaven, while I alone handed my transfer to the conductor of the Hades Express.

The last few minutes in the waiting room I spent pondering the flight insurance, torn between paying \$1 for \$5000 coverage, or \$2 for \$10,000. I felt I was worth \$10,000, but on the other hand if we didn't crash I would have wasted \$2. I finally decided it was worth an extra dollar to make it across safely. I have always felt the money was well spent.

Aboard the North Star I promptly fell in love with the stewardess. She didn't have to go to

Heaven. She was obviously an angel already. Her wings were on her little grey cap, but she couldn't fool me. At the first sign of a crash I would jump into her arms and hope to get into The Club as a guest.

She handed me a booklet called "Ditching Procedure." This explained how to act if we were forced to land in the ocean. Before we had taxied to the end of the runway I could recite the booklet from memory, including the name of the printer. Even now I remember one of the instructions: "When stepping from the aircraft into the rubber dinghy please avoid getting wet unnecessarily." If my throat hadn't been so dry I would have laughed at that bit.

When we were airborne and I'd opened my eyes, the steward told us how to put on our Mae Wests, the inflatable life preservers. He looked impressive in his Mae West but I still preferred the stewardess. When she put a pillow on my lap I held out my arms for her, but she put a tray of food on it.

In the meantime we had landed at Prestwick, Scotland. By no means the least exciting part of your round flight to London is that you get to visit two, maybe three countries besides England. I had an hour in Scotland and two hours in Iceland, where the plane stopped to refuel and I learned the Icelandic word for men's washroom. On the return trip we landed at Goose Bay, Labrador, and just missed Shannon, Ireland. Best of all, we didn't land in the ocean once.

And when I stepped from the plane in Montreal, very conscious of the waiting crowd fringing the tarmac, my eyes had that steely look of the man accustomed to daring the wide blue yonder, to playing tag with the clouds. I was a veteran of the great adventure, tried, triumphant.

It wasn't until I got to my hotel room that I found I had forgotten to give the nun back her Bible.

It's in the Wind

8. It's Colder At My Place

By R. A. Hornstein, Meteorological Division, Dept. of Transport.

*To talk of the weather is nothing but folly;
When it rains on the hill the sun shines in the
valley.*

SCOTTISH RHYME

MANY OF US are proud of the fine thermometers we own and which we have carefully set up in the perpetual shade of the north side of our homes. Some of us are disappointed when our thermometers provide readings which are markedly different from the "official" one — a situation which often occurs on the calm, cold mornings of mid-winter. Still, we need not be, because temperatures are not absolutely uniform over a province, or a county, or a township, or a town, or even a city block or a country farm.

When considering temperature differences it is necessary, of course, to rule out the possibility of inaccurate thermometers. If two ordinary run-of-the-mill thermometers are hung side by side, their readings probably will not be the same. Cheap thermometers are often inaccurate; the tube containing the liquid may not be the same size along its entire length or it may be insecurely fastened to the board on which the degree marks are printed. Should the second fault exist, when the thermometer is jarred the tube may slide up or down and the reading will be wrong by several degrees. A good thermometer always has the scale etched right on the glass.

Sometimes, too, the liquid in the thermometer separates, leaving a small portion in the upper part of the tube; this makes the thermometer read too low.

Having ruled out inaccuracies in the thermometers themselves, the next important question is: where is the thermometer located? It must be kept in mind that the air is warmed very little by direct sunlight; it receives most of its heat from the earth's surface, which in turn is heated by the sun. Some parts of the earth's surface absorb heat readily and become much hotter than others. An asphalt pavement or a brick wall or a tile roof will become much hotter under the direct rays of the sun than will a grassy lawn or a patch of shrubbery,



If a thermometer is near one of these heaters of the air, especially in a place where there is no breeze, it will not provide a correct measure of the average air temperature. This is just as true as the fact that the right value of the general temperature of a room cannot be determined from a thermometer hung directly over a radiator or a stove.

Furthermore, if the thermometer is in direct sunlight it will absorb more heat from the sun's rays than the air does and it will become hotter than the air. Consequently, to obtain the correct temperature of the air outdoors it is necessary that the thermometer be protected from both direct and reflected sunlight and also, of course, from rain and snow. At the same time it must be exposed to free and easy circulation of the air.

In the Weather Service this is done by placing the thermometers in a specially built shelter made of wooden slats; in addition, a steady circulation is maintained by drawing air through the shelter with an electric fan. Finally, the shelter itself should be located in a flat grassy plot of land and on supports which are of such length that the thermometer is about four and a half feet above the ground.

The Weather Bureaus are learning it is more and more difficult to find ideal locations for their thermometers. As cities continue to grow, grassy plots are not easy to come by, and some of our locations are far from satisfactory. For example, in some cities, although the Weather Office thermometer is in a properly ventilated shelter it is on the roof of an office building, perhaps 100 feet instead of about $4\frac{1}{2}$ feet above the ground.

Suppose, though, that everyone has accurate thermometers, and, furthermore, that they are all properly installed some $4\frac{1}{2}$ feet above a grassy plot in a standard shelter. They still will not always read the same!

First of all there is the matter of the distance of the thermometer from large bodies of water. Regions, and particularly islands and promontories, immediately bordering the coast of the Atlantic or the Pacific or any large unfrozen body of water, have milder temperatures than are commonly experienced farther inland. This is because of the warming effect of the extensive, relatively

warm, water surfaces. Because of its great depth and the enormous amount of its stored heat, the sea does not cool off rapidly. Consequently, when temperatures inland plunge downward the sea pours out heat just like a radiator and keeps the coastal strip somewhat warmer. As a result places near the shore do not get their first frost as early in the autumn as do communities farther inland, nor do the coastal locations become as cold on frosty mid-winter days and nights.

Still, even two places close together, whether they be along the coast or well inland, will not have the same temperatures. The greatest factor in creating differences between neighbouring thermometers on a clear, cold morning is their relative altitude. Small elevations and changes in the slope of the ground create differences that are surprisingly large on calm nights. The cold air slides downhill and a hundred feet difference of altitude on a hillside may mean 10 degrees difference of air temperature. A depression in the ground will contain a puddle of air much colder than anything around it.

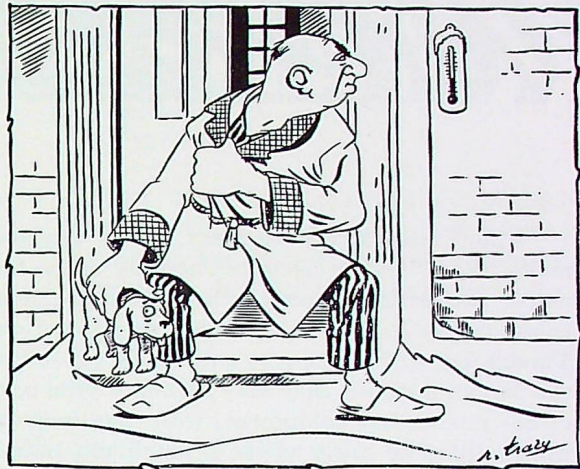
Two officials of the Headquarters staff of the Canadian Meteorological Division in Toronto once experimented with this feature. On February 22nd, 1936, using specially built thermometers they cruised along Yonge Street, one of the main streets in the city of Toronto. They started at six minutes past midnight 8 miles up Yonge St., and drove down to the lake front, reaching it at 12:48 a.m. Then they returned and at 1:18 a.m. they again reached their starting point. During their trip they recorded temperatures continuously and they found that they ranged all the way from 16 degrees *above zero* to 17 degrees *below*. As they drove down into one valley at the north end of Yonge St. there was a drop of 27 degrees in just a few blocks. This was an extreme case, but similar situations occur regularly on clear, calm nights. During such nights the earth's surface cools rapidly by radiation, and the temperature of the the air layer next to the ground drops quickly. The cold air is heavy and it flows downhill along the slope and collects at the valley bottom.

Another example taken on a clear windless morning in cold weather showed plainly the

temperature variations along the slope of a hill. At Worcester, Mass., the temperature on the top of a 250-foot hill was found to be 10 degrees warmer than at the bottom. Whereas it was 16 degrees below zero at the bottom, it was 6 below at the higher levels. Furthermore, there were differences of as much as 8 degrees at points just 30 feet different in height.

In a recent winter at Moncton, N.B., the official reading at the airport was 24 degrees below zero one morning, while at the city pumping station, a few miles distant, it was 36 degrees below zero. In this case also the cold air drained into the lower ground, the pumping station being about 200 feet lower than the airport.

On clear, calm nights, then, locations close together may have quite different temperatures. There will be occasions when all the thermometers agree very well but these will normally be nights which are very windy. On a windy night the air is well mixed and pools of very cold air cannot



collect in the hollows. Instead, over large areas and at all heights within a reasonable distance of the ground, accurate properly exposed thermometers will read much the same.

“WHAT’S THE SCORE?”

“What’s the Score?” has been a regular feature of “The Roundel” ever since the magazine started, but it has yet to find favour with Sgt. Shatterproof. We are therefore seeking help from the field.

Questions are solicited from all our readers. Whether you have one question or a hundred questions — please send them in, indicating which of the answers is the correct one. Choice of subject is left entirely to you, but questions should be such as the average reader of “The Roundel” has at least a sporting chance of being able to answer. Despite the Editorial Committee’s abysmal score on the questionnaire in this issue, the fact remains that all of us have at some time or other, whether at school or during our miscellaneous reading, read the correct answers to at least sixteen of the questions asked.

Acknowledgment will be made to all readers who submit questions that are published. Unused material cannot be returned.

★ What's the Score?

"What," asks a correspondent, "does 'Orenda' really mean?" While we were checking up on the matter, we ran into several rather interesting facts connected with Canada's indigenous population. Though not at present very intimately related to the Service purpose, they may become a vital part of our intellectual equipment, from Sagamore of the Air Staff to brave in the field, should Indian nomenclature become generally adopted by the R.C.A.F. Neither ethnology nor folk-lore, we regret to say, appears to be the long suit of the Editorial Committee. Its members' average score was 6. Correct answers appear on page 48.

1. "Orenda":

- (a) Is the name of the Algonquian sun-god.
- (b) Is a Mohawk word meaning "thunder."
- (c) Denotes, not a specific spirit, but the underlying motive force of the Red Man's cosmos.
- (d) Was a Huron war-cry.

2. The word "shaman," commonly applied to Indian or Eskimo medicine-men, is derived from the:

- (a) Sanscrit.
- (b) Iroquois.
- (c) Latin.
- (d) Micmac.

3. The name of our country comes from:

- (a) An early Spanish explorer's exclamation: "Acà nada!" ("Nothing over there").
- (b) The Huron "kanàda" ("a village").
- (c) "Adanac", the name of an extinct Beothukan tribe.
- (d) An Indian word meaning "bloated beaver."

4. All Indian and Eskimo languages are of a type called by philologists:

- (a) Synthetic.
- (b) Agglutinative.
- (c) Analytic.
- (d) Chromatic.

5. The name "Iroquois":

- (a) Means "slow death."
- (b) Comes from an Algonquian word meaning "real adds," and was given to the Five Nations by the French.
- (c) Comes from a Montagnais word meaning "bad teeth," and was given to the Six Nations by the British.
- (d) Means "Great Sky Spirit."

6. Kickapoo is:

- (a) Cree for "joy juice."
- (b) An Indian word for "moose."
- (c) The name of an Algonquian tribe.
- (d) A form of torture formerly used to hurry missionaries to the stake.



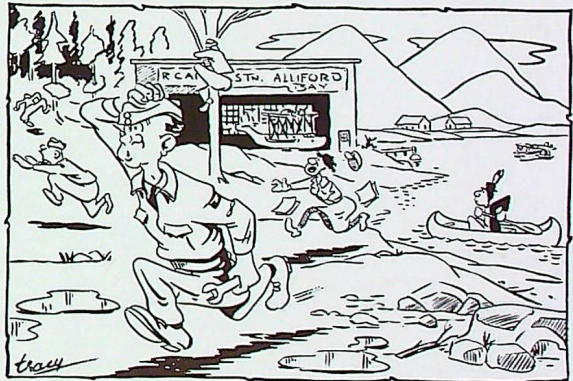
7. "Sachem" is:

- (a) The name of an Indian saxophonist.
- (b) A kind of shaman specializing in the poisoning of wives.
- (c) An Indian title meaning "chief".
- (d) A form of pincers designed for eradicating missionaries' toe-nails.

8. Canada's total Indian and Eskimo population at the time of the white man's arrival is estimated to have been about:

- (a) 2,000,000
- (b) 1,000,000
- (c) 752,000
- (d) 220,000

9. The total Indian and Eskimo population of Canada is, according to the most recent census:
- 863,560
 - 400,860
 - 1,000,000
 - 153,720
10. Wampum was the name given to:
- A decorative material made from porcupine quills.
 - A glue used to reattach scalps to reprieved captives' heads.
 - Strung beads made from shells and used as money.
 - Deer-sinew used for bow-strings.
11. There are today ten language stocks among the Indians and Eskimos of Canada. Six of them are found in B.C. The remaining four are:
- Cree, Ojibway, Eskimo, Algonquian.
 - Eskimo, Sioux, Algonquian, Iroquois.
 - Huron, Montagnais, Algonquian, Eskimo.
 - Iroquois, Algonquian, Eskimo, Cree.
12. Tuscarora:
- Was the name of a tribe from N. Carolina who joined the Five Nations in 1715.
 - Was a wild boar (fortunately now extinct) honoured by the early Haidas in their annual fertility rites.
 - Is the Mohawk word for "waterspout."
 - Was a fermented drink commonly tipped by the participants at a torture-party.
13. Most noted among all Indian peoples for their strength and unshakable courage were:
- The Sioux.
 - The Montagnais.
 - The Mohegans.
 - The Mohawks.
14. Only two means of transportation were known to the Indians of Lower Canada at the time of the white man's arrival. They were:
- The canoe and the *travois*.
 - The horse and the sleigh.
 - The ox-cart and the canoe.
 - The sleigh and the canoe.
15. The reputed founder of the Five Nations (in about 1555) was:
- Gitchee Manitou.
 - Hiawatha.
 - Sitting Bull.
 - Tippencanoe.
16. Bitter foes of the British at the time of the Anglo-French struggle for Canada were:
- The Iroquois.
 - The Mohawks.
 - The Sioux.
 - The Algonquins.
17. "What a peak!" exclaimed (according to legend) one of Cartier's men — in French, of course. It has been erroneously claimed that his remark gave rise to the name of:
- Kenogami.
 - Quebec.
 - Lévis.
 - Montreal.
18. The name of Hiawatha's wife (Minnehaha) means:
- Peaceful Lake.
 - Babbling Brook.
 - Roaring Cataract.
 - Laughing Water.
19. The warlike Haidas inhabit:
- The shores of Great Slave Lake.
 - The Okanagan Valley, B.C.
 - The Queen Charlotte Islands.
 - Cape Breton Island.



20. The haze that hangs on the landscape during an "Indian summer" was reputed by the Indians to be:
- The first breath of the new-born Spirit of Winter.
 - The last breath of the dying Spirit of Summer.
 - The smoke from the peace-pipe of the Great Spirit.
 - The spray from the paddle of the Spirit of Autumn making his get-away.

Personnel Movements ★ ★ ★

OFFICERS: JULY

S/L G. H. Currie — R.C.A.F. Stn. Gimli to 2 F.T.S., Gimli.

OFFICERS: DECEMBER

S/L R. M. Beer — C.J.S. Washington to 2 A.D.C.C., Chatham.

S/L M. J. H. M. Belleau — R.C.A.F. Stn. Macdonald to 1 (F.) O.T.U., Chatham.

S/L A. W. Bishop — C.J.S. Washington to 12 A.C. & W. Sqn., Mont Apica.

W/C W. W. Gilmour, A.F.C. — 3 F.T.S., Claresholm, to Staff Coll., Toronto.

W/C W. C. Kent — 32 A.C. & W. Sqn., Foymount, to A.M.C.H.Q., Ottawa.

A/V/M J. G. Kerr, C.B.E., A.F.C. — T.A.G.H.Q., Edmonton, to T.C.H.Q., Trenton.

S/L A. R. MacKenzie, D.F.C. — R.C.A.F. Spec. Force, Korea, to A.D.C.H.Q., St. Hubert.

S/L E. G. Smith, D.F.C. — R.C.A.F. Spec. Force, Korea, to A.D.C.H.Q., St. Hubert.

OFFICERS: JANUARY

W/C R. A. Ashman — A.D.C.H.Q., St. Hubert, to Air Div., France.

S/L W. J. Buzza — 434 (F.) Sqn., Uplands, to 422 (F.) Sqn., St. Hubert.

S/L D. O. Coons — R.C.A.F. Stn. St. Johns to 1 (F.) Wing H.Q., U.K.

W/C H. F. Darragh, A.F.C. — A.F.H.Q. to 1 F.I.S., Trenton.

S/L S. O. Decker — 1 Req. Unit, U.S.A., to A.M.C.H.Q., Ottawa.

S/L K. C. M. Dobbin — 435 (T.) Sqn., Edmonton, to Sewart A.F.B., U.S.A.

S/L W. H. Durnin, A.F.C. — T.A.G.H.Q., Edmonton, to T.C.H.Q., Trenton.

S/L J. W. C. Galvin — 1 F.T.S., Centralia, to C.J.S. Washington.

W/C W. L. Gillespie — R.C.A.F. Stn. Winnipeg to A.F.H.Q.

S/L C. J. Girard — R.C.A.F. Stn. Edmonton to T.A.G.H.Q., Edmonton.

S/L W. A. Goodall — 1 S.D., Trenton, to C.E. & P.E., Rockcliffe.

W/C A. C. Hull, D.F.C. — A.F.H.Q. to 2 (F.) Wing, France.

W/C R. B. Ingalls, D.S.O., D.F.C. — Staff Coll., Toronto, to R.C.A.F. Stn. Winnipeg.

S/L H. D. Irwin — R.C.A.F. Stn. Lachine to R.C.A.F. Stn. Clinton.

W/C A. M. Jardine, A.F.C. — T.C.H.Q., Trenton, to A.F.H.Q.

S/L J. A. King, D.F.C. — C.J.S. Washington to 33 A.C. & W. Sqn., Falconbridge.

W/C F. F. Lambert, D.S.O., D.F.C. — 21 A.C. & W. Sqn., Chatham, to Pepperell A.F.B., Nfld.

S/L J. C. Lovelace, D.F.C. — C.J.S. Washington to T.C.H.Q., Trenton.

S/L R. B. Murray — 2 F.T.S., Gimli, to T.C.H.Q., Trenton.

S/L J. N. Nalty — T.C.H.Q., Trenton, to A.F.H.Q.

G/C L. H. Randall, D.F.C. — R.C.A.F. Stn. Winnipeg to N.A.T.O. Defence Coll., France.

S/L R. J. Richardson — R.C.A.F. Stn. Toronto to A.M.C.H.Q., Ottawa.

S/L B. L. Robinson — A.M.C.H.Q., Ottawa, to Air Div., France.

W/C J. A. Sifton — A.T.C.H.Q., Lachine, to R.C.A.F. Stn. Rockcliffe.

W/C P. S. Turner, D.S.O., D.F.C. — R.C.A.F. Stn. Chatham to A.F.H.Q.

OFFICERS: FEBRUARY

S/L O. G. Nelson, A.F.C. — 2 (M.) O.T.U., Greenwood, to 404 (M.R.) Sqn., Greenwood.

WARRANT OFFICERS: DECEMBER

WO2 C. W. Baine — 1 P.R.C., Lachine, to 412 (T.) Sqn., Rockcliffe.

WO1 P. J. S. MacKenzie — 1 R. & C.S., Clinton, to A.D.C.H.Q., St. Hubert.

WO2 T. N. Norton — R.C.A.F. Stn. Rockcliffe to 412 (T.) Sqn., Rockcliffe.

WO2 D. S. T. Stirling — 2 P.S.U., London, to 1 O.S., London.

WARRANT OFFICERS: JANUARY

WO2 B. A. Andrews — R.C.A.F. Stn. Saskatoon to 2 (F.) Wing H.Q., France.

WO1 E. G. Armstrong — A.M.C.H.Q., Ottawa, to 5 S.D., Moncton.

WO2 J. P. Baril — R.U., Montreal, to 2 M.D., St. Johns.

WO2 J. R. Bélanger — 2 M.D., St. Johns, to R.C.A.F. Stn. Camp Borden.

WO1 A. G. Brooks — 1 Req. Unit, Dayton, to C.E. & P.E., Rockcliffe.

WO2 W. J. Brown — R.C.A.F. Stn. Centralia to A.M.C.H.Q., Ottawa.

WO1 A. E. Dallaire — R.C.A.F. Stn. Lachine to R.C.A.F. Stn. Uplands.

WO2 L. A. Darbey — 2 S.D., Vancouver, to 1 S.D., Weston.

WO1 L. C. Ellison — C.E. & P.E., Rockcliffe, to A.M.C.H.Q., Ottawa.

WO2 W. O. Hamilton — 1 S.D., Weston, to A.T.C.H.Q., Lachine.

KEY TO ABBREVIATIONS

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|-------------|---|
| A.A.S. | — Air Armament School. |
| A.C. & W. | — Aircraft Control and Warning. |
| A.D.C.C. | — Air Defence Control Centre. |
| A.D.C.H.Q. | — Air Defence Command Headquarters. |
| A.F.B. | — Air Force Base. |
| A.M.B. | — Air Materiel Base. |
| A.M.C.H.Q. | — Air Materiel Command Headquarters. |
| A.T.C.H.Q. | — Air Transport Command Headquarters. |
| C.E. & P.E. | — Central Experimental and Proving Establishment. |
| C.J.S. | — Canadian Joint Staff. |
| C.M.U. | — Construction and Maintenance Unit. |
| (F.) | — Fighter. |
| F.I.S. | — Flying Instructors' School. |
| F.T.S. | — Flying Training School. |
| (M.) | — Maritime. |
| M.D. | — Manning Depot. |
| (M.R.) | — Maritime Reconnaissance. |
| N.A.T.O. | — North Atlantic Treaty Organization. |
| O.S. | — Officers' School. |
| O.T.U. | — Operational Training Unit. |
| P.R.C. | — Personnel Reception Centre. |
| P.S.U. | — Personnel Selection Unit. |
| R. & C.S. | — Radar and Communications School. |
| R.D. | — Repair Depot. |
| Req. Unit | — Requirements Unit. |
| R.U. | — Recruiting Unit. |
| S.D. | — Supply Depot. |
| (T.) | — Transport. |
| T.A.G.H.Q. | — Tactical Air Group Headquarters. |
| T.C.H.Q. | — Training Command Headquarters. |

WO1 R. B. Hampton — A.T.C.H.Q., Lachine, to 1 S.D.,
Weston.
WO2 A. F. Henderson — 2 C.M.U., Calgary, to A.M.C.H.Q.,
Ottawa.
WO2 F. J. Hill — 426 (T.) Sqn., Dorval, to R.C.A.F. Stn.
Lachine.
WO2 F. A. Kenning — 2 C.M.U., Calgary, to 6 R.D.,
Trenton.
WO1 E. A. Mitchell — 407 (M.R.) Sqn., Comox, to R.C.A.F.
Stn. Sea Island.
WO2 G. J. Norgaard — 25 A.M.B., Calgary, to C.E. & P.E.,
Rockcliffe.
WO2 P. Palylyk — R.C.A.F. Stn. Sea Island to A.D.C.H.Q.,
St. Hubert.

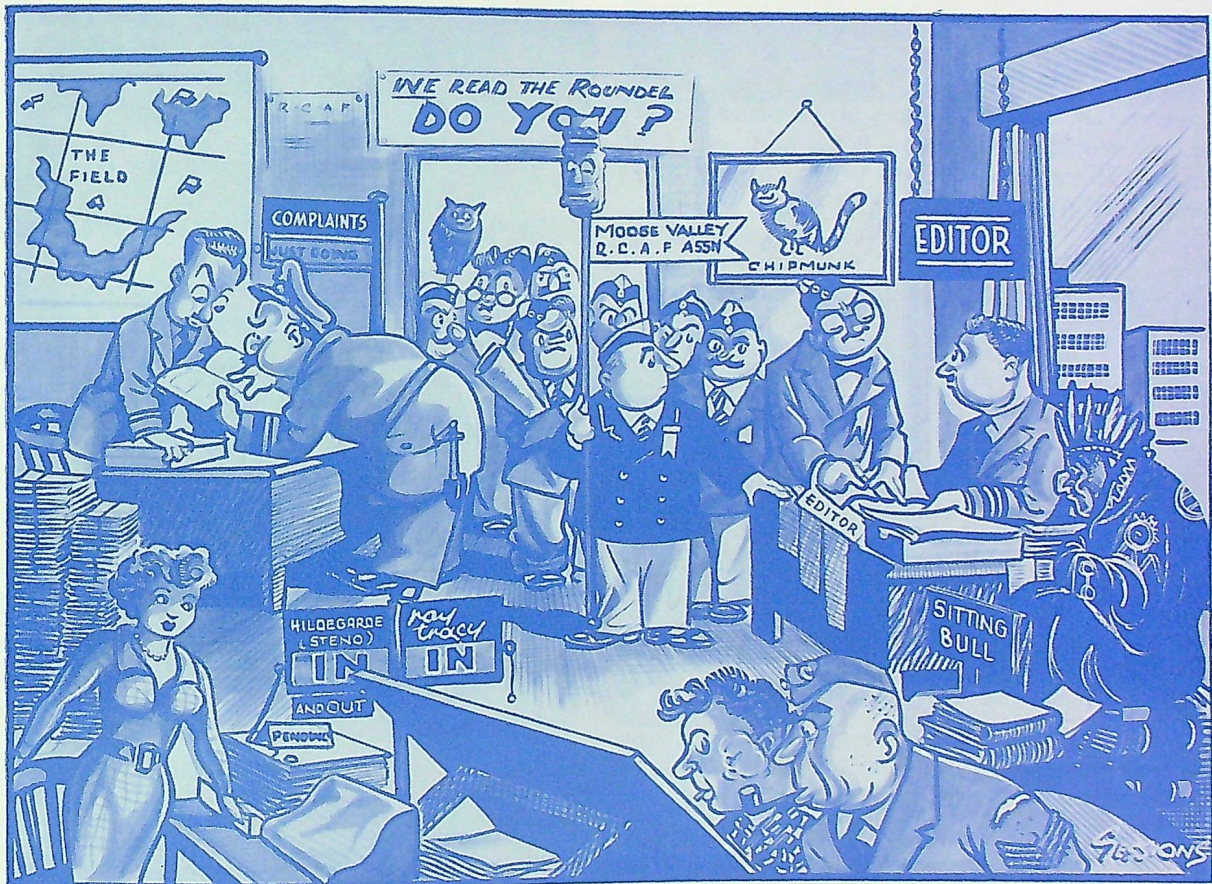
WO2 E. J. Robbins — A.F.H.Q., to C.J.S. London.
WO2 J. W. Wilkes — R.C.A.F. Stn. Greenwood to 422 (F.)
Sqn., St. Hubert.
WO2 G. K. Wright — 441 (F.) Sqn., U.K., to 1 P.R.C.,
Lachine.

WARRANT OFFICERS: FEBRUARY

WO2 W. V. J. Carroll — R.C.A.F. Stn. Trenton to A.A.S.
Trenton.
WO2 L. T. Seguin — 412 (T.) Sqn., Rockcliffe, to 2 (F.)
Wing H.Q., France.

AS OTHERS SEE US

Mr. H. W. Sessions, whose humour has delighted the R.A.F. for some years past, recently sent to W.O.1 R. A. Tracy his impression of the office of "The Roundel" — which he has never seen except with the eye of a cartoonist's imagination.



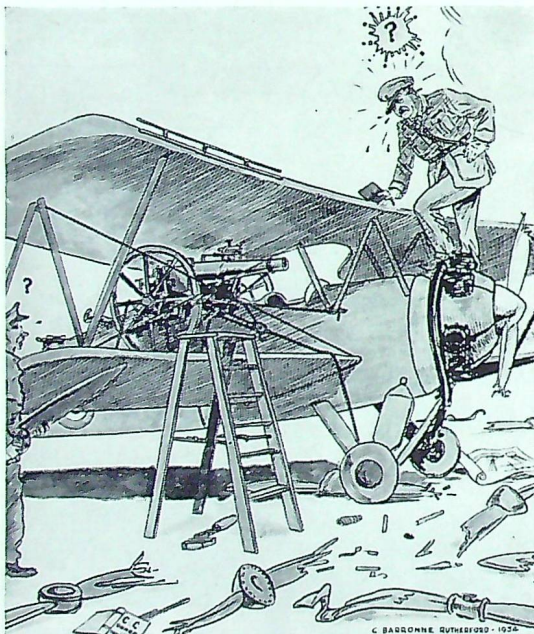
A Deputation from the wide open spaces visits the "Roundel" office.

Pin-Points in the Past

Camp Borden is the target for this month's exploring pin.

The two floats formed part of the parade on Sports Day in 1929. Standing beside Ye Old Swimming Hole is Sgt. George Howard, while within it is LAC René Roy, both of whom have since been released. The model for the 1929 airmen's summer dress is Cpl. F. X. Charbonneau ("Two-Bit Louis"), also released. All three photographs were kindly sent in by W.O.2 G. F. Bottrill, of No. 1 S.D., Weston.

The cartoon, which was lent to us by Flt. Lt. E. A. Kahala, of A.F.H.Q., shows Major J. C. Murchie (later Chief of the General Staff) pioneering aircraft armament. Major Murchie was then (1934) attached to the Air Force as an army co-operation instructor, and he prophesied that aircraft would carry cannon in the next war. The puzzled airman shown on the left was meant to be Cpl. (now Wing Cdr.) C. D. McLean.



The Suggestion Box

The Chief of the Air Staff has written to the Personnel whose photographs appear on this page, thanking them for suggestions which have been officially adopted by the R.C.A.F.

Sgt. J. W. Jamieson, of No. 123 Rescue Unit, devised a new let-down procedure to be followed by jumpers who find themselves "hung up" after jumping into heavily timbered terrain. The new procedure, which materially reduces the physical effort demanded of the jumper, involves the use of let-down belts designed by its originator.

Flt. Sgt. G. F. Trimm, of Air Defence Command H.Q., drew up a plan for a standard method of zoning and code-numbering fire-alarm boxes on R.C.A.F. stations. Among its advantages, his system will assist in the swift and accurate location of fires, permit the installation of as many additional alarm boxes as may be required, and eliminate the need for fire-fighters to become accustomed to new zoning systems whenever they are transferred to a different station.

LAC J. A. P. F. Tessier, of the Central Experimental and Proving Establishment, designed a cover for the roller assembly of the maintenance stands used in working on J-47 and Orrenda engines. Use of this cover prevents the possibility of injury to fingers or hands while the stands are being rotated.



Sgt. J. W. Jamieson.

LAC J. A. P. F. Tessier.

Flt. Sgt. G. F. Trimm.



Air Marshal C. R. Slemon, C.B., C.B.E.

A Brief Service Biography

Air Marshal Charles Roy Slemon, C.B., C.B.E., who on January 31st took over the position of Chief of the Air Staff from Air Marshal W. A. Curtis, C.B., C.B.E., D.S.C., is one of the five original members of the R.C.A.F.

His career began, thirty years ago, as a cadet in the Canadian Air Force. In 1923, while still an engineering student at the University of Manitoba, he became the first pilot to be trained and to fly solo in Canada after the First World War. With the exception of the year 1929, which he spent in England on a navigation course, the early period of Air Marshal Slemon's Service life was occupied entirely by mapping and exploratory operations in the Canadian North. It is of interest to note that, though he flew more than 100,000 miles while engaged in this work, he never even so much as bent an undercarriage or damaged a hull — a record which he retains unblemished until the present day.

From 1933 to 1935 he served as a navigation instructor at Camp Borden, with the rank of Flight Lieutenant. Promotion to Squadron Leader followed his transfer to A.F.H.Q. as Staff Officer Photographic Operations.

His tour of duty as a Staff Officer was terminated by a posting to the R.A.F. Staff College course at Andover, England, whence he returned to Canada in 1938 to be appointed Senior Air Staff Officer of the newly established Western Air Command. He remained in this position until June 1941, when, as a Group Captain, he became officer commanding the Command.





Air Marshal Curtis takes his last salute as C.A.S.



Air Marshal C. R. Slemon (left) and Air Marshal W. A. Curtis, at the handing-over parade on 31 January 1953.

His next job was that of Director of Air Operations at A.F.H.Q. (November 1941 to July 1942). He relinquished this in order to fly both Air Vice-Marshal G. E. Brookes, C.B., O.B.E., and himself overseas, where they assumed the duties, respectively, of A.O.C. the new No. 6 (R.C.A.F.) Bomber Group and of Senior Staff Officer. Promoted to Air Commodore in 1943, he was assigned to R.A.F. Bomber Command Headquarters as Deputy Chief of Operations in September 1944, to be selected some six months later as Deputy to the C.-in-C. of the R.C.A.F. overseas, with the rank of Air Vice-Marshal. It was while holding this latter position that he was named to head the R.C.A.F.'s Pacific Air Force; and he returned to Canada to begin its organization.

The surrender of Japan, however, removed the necessity for further work in this direction, and Air Vice-Marshal Slemon became Air Member for Supply and Organization. In March 1948 he left this post for that of Air Member for Operations and Training, whence he was transferred, in September 1949, to his last field command as A.O.C. Training Command, at Trenton.

Air Marshal Slemon's record of experience, leadership, and achievement, is one of which all those under his command may justly be proud.



The TURBO-JET, RAM-JET and ROCKET AIR FORCE OF THE FUTURE

By Captain Norman Macmillan, M.C., A.F.C.

(Reprinted by courtesy of "Aeronautics": U.K.)

Introduction

THE SCIENTISTS' activities are leading us into four distinct fields of air war. These take the form of swept-wing and delta-wing aircraft manned by aircrews, robot expendable bombers, robot ram-jet missiles, and long-range rocket missiles. All (except defence fighters) can be designed to carry atomic bombs or war-heads, chemical explosives, fire-bombs, gas, or bacterial contents.

The scientists' efforts are affecting both defensive and offensive warfare. Sooner or later they are likely to affect the organization of the air force itself, for the increasingly scientific mechanization must modify the conception (hitherto fundamental) that an air force is a military organization produced, trained and equipped to enable men to ascend into the air and use it as a medium for air-to-air combat, air-to-surface assault, reconnaissance, transportation, and as an auxiliary arm to surface forces.

Germany handed over the duties of anti-aircraft artillery to her air forces in the Hitler régime, but all other major states retained their anti-aircraft artillery as an arm of their army, even when it came under the operational command of an air force C-in-C. How, then, are robot missiles to be apportioned? Are those which operate at short range, and therefore may be likened to artillery, to become weapons of the army, while those directed against long-range targets, which may be regarded as the equivalent of bombers, are allotted to the air force? Are they to be considered as projectiles or as aerodynes? Ought they to be divided into categories at all? Would it not be better to organize the

manpower to suit the new weapons rather than endeavour to arrange the new weapons to fit the traditional division of military responsibilities? These are questions which must inevitably arise, and upon which Cabinet decisions must be made at some time, as was the case with naval aviation.

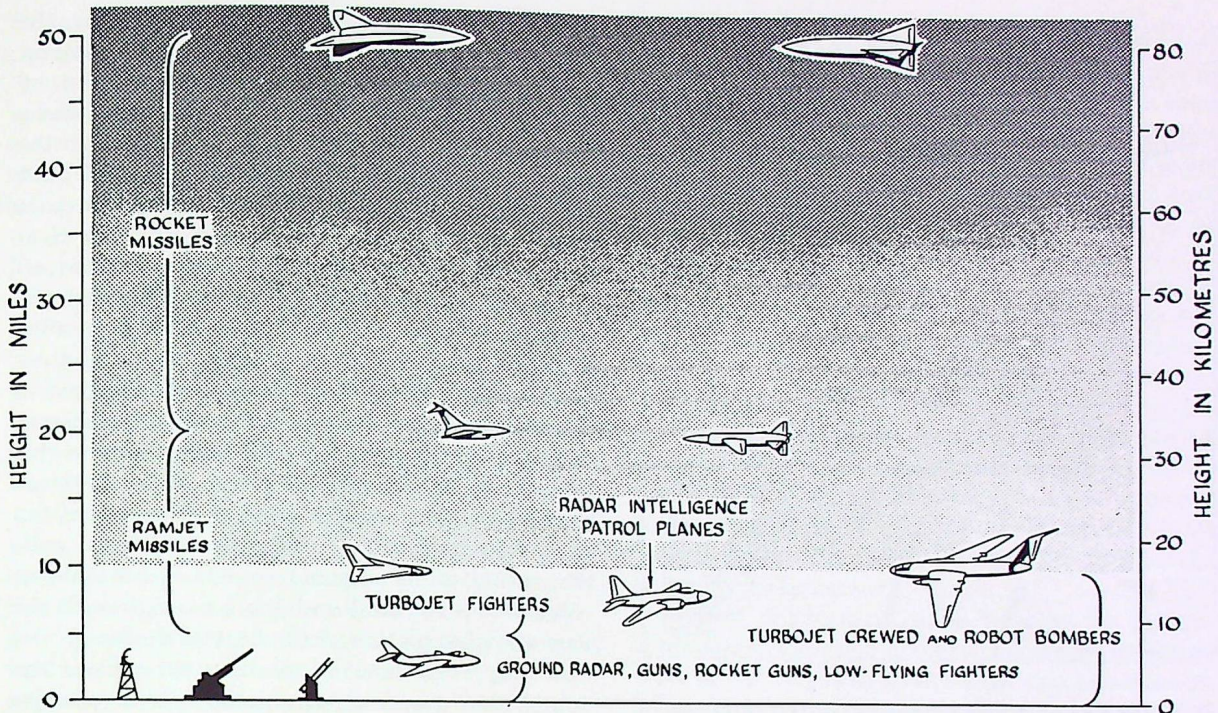
Before making any pronouncement on this problem, let us first consider the possible weapon developments of an air force, so far as they can be foreseen at present and (within the limits of security) stated.

Weapon development for defence

In defensive air warfare conventional guns are likely to be relegated for use at short range against low-altitude targets. The performance of even our present-day jet aircraft can carry them above the height to which the largest-calibre anti-aircraft gun can elevate its shells with speed and accuracy. Robot expendable bombers might or might not fly within their arc of fire, but ram-jet and rocket missiles will fly far above it.

New methods of defence are therefore required to meet the developing conditions of possible air attack. These new methods may emerge under two heads, one directed by aircrews, and the other entirely robot but directed by groundcrews during part of the airborne journey.

So long as conventional bombers (of whatever wing shape), flown by aircrews, are employed, it is a reasonable supposition that interceptor fighters flown by one or two men will be required. For, however cunningly the robot may be contrived, it cannot possess the power of judgment possessed by the skilled, trained human pilot. The intercepting robot must begin its journey from the



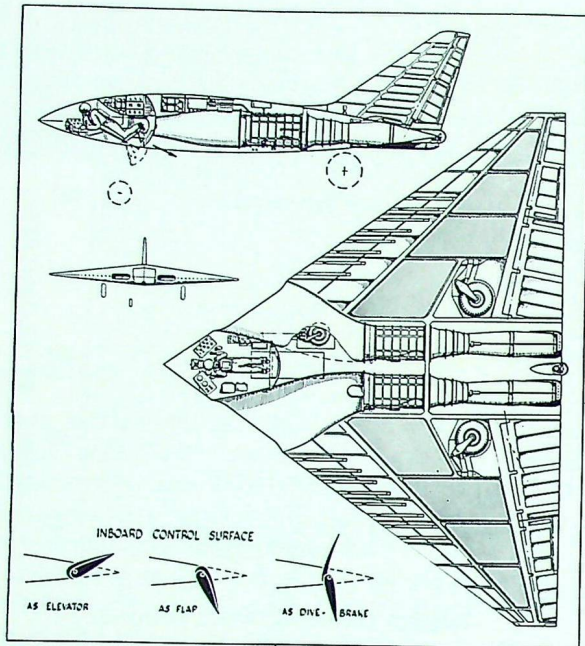
The defence may use ground artillery, manned fighters, ram-jet or rocket missiles according to the altitude of attack. The attack may use the manned bomber, at comparatively low altitude, the ram-jet or the rocket missiles. This diagram shows the respective height zones in which these various kinds of aircraft or missile can be expected to operate.

ground, and must start that journey in accordance with intelligence of a target received by its human-cum-robot groundcrew. The aircrew-manned interceptor, on the other hand, can be airborne in advance and in receipt of intelligence both from ground stations and from its own airborne radar or that of collaborating aircrewed aircraft. Indeed, it is possible to conceive of conditions which would demand the maintenance of an airborne detector system flown by aircrews in order that intelligence may be received a sufficient time in advance of an onslaught, either by aircrew bombers or robot missiles, to make it possible for defence of any kind to operate efficiently. Such a condition might arise if the United Kingdom were again to be isolated as it was in 1940.

Certainly aircrewed interceptor fighters will continue to be developed with ever-increasing jet-engine power until a single interceptor may have the equivalent of 50,000 horsepower built into it

in jet thrust without boost injection or reheat. These interceptors will be radar-equipped for long-range detection, carry electronic sights with automatic firing, and will discharge ultra-supersonic self-homing missiles whose proximity fuses will detonate charges of greater lethal radius than any hitherto used by interceptors. These they will discharge at long range. For closer engagement they will also carry small batteries of relatively large-calibre guns. They can thus be likened to naval ships, which have long carried both primary and secondary armament.

The aircrews flying these interceptors will be enclosed in pressure cabins, will breathe oxygen, wear pressure suits to ensure oxygenation at great heights and ensure their safety if their pressure cabins should be punctured in combat. They may have to wear special breathing sweat-suits next their skin to provide a proper balance of body temperature, and they will certainly wear g-suits



This turbo-jet-driven delta-winged fighter is intended to represent the kind of manned fighter of long range which would have a maximum speed between Mach 1.0 and 1.5. The twin engines would give a maximum thrust at sea level of some 10,000 kilograms (22,000 lb) without after-burning or injection. The pilot occupies a prone position and may wear a g-suit as well. For escape his couch is ejected downward and rearward. The artist has assumed that improved radio technique will allow the use of very small paraboloid reflectors.

to enable them to withstand the enormous centrifugal loads of manoeuvring at supersonic speeds. They may have to accept a prone position instead of a sitting posture in the aircraft, partly to minimize the effects of manoeuvre loading, and partly to accommodate their bodies best to the newer designs of aircraft; and in this case the normal aircraft controls which have hitherto been seen in cockpits may have to be radically altered to suit the altered installation of the pilot.

Their cabins will be warmed with hot air tapped from the jet compressor when on or near the ground in cold weather, and cooled with refrigerated air when flying at high speed, when skin friction of the air can raise the temperature of the metal to 100 degrees centigrade, and when at

great heights the cosmic radiation raises the temperature still higher. They will sit in ejector seats, or lie on ejector stretchers, by which they can be shot out of the aircraft like a shell from a gun, with a special visor pulled down over the face or head to protect it from the frightful blast of air at the instant of ejection. They will pass through the space that was covered by the clear plastic bubble canopy before it was thrown off in the first drill movement for evacuating aircraft.

Amid the acrid fumes of the cartridge powder they will shoot into the thin air, carrying their own special emergency supply of oxygen; a parachute will open to slow down their momentum; the seat or stretcher will float away on this canopy; and the man will plunge down through the stratosphere breathing his emergency oxygen as he falls until, at a reasonable height, he pulls the ripcord of his personal parachute (or a stator valve does it for him) and floats to earth with the slow swinging motion of the braked descent.

It may even become necessary to enclose the man within a special cocoon-like plastic canopy of his own, within which he could be ejected in emergency with greater safety. Such a canopy might have small wings with suitable controls, so that if the aircraft were evacuated over the sea, the cocoon could be used as a glider to steer towards land before the parachute descent began. From great heights a considerable distance might be gained in this way, with a resulting saving in life or reduction in the number of pilots who were exposed to the unfriendly waters in small single-seat rubber dinghies whose packs form part of their personal safety equipment.

It seems almost incredible that men can be asked to operate under such conditions of artificiality. But today we are on the verge of them, and some of the conditions described are already operative. The others will be accepted by young men as part of the normal duties of military aviation, with themselves the spawning plasma of the scientist who makes their bizarre career a reality.

We are indeed near the possibility that the aluminium of the leading edges of aircraft wings might become so hot with the combination of air

friction and cosmic radiation as almost to reach melting point, so that either the leading edges of the wings must be cooled at great heights and speeds, or some different metal with a higher melting-point — such as titanium — be used for that part of the wing. While lower down, when passing through the damp atmosphere, the leading edges must be warmed by thermal airflow tapped from the jet engine in order to prevent ice forming and distorting the wing shape.

Throughout the flight the humidity conditions for the aircrew must be controlled with reasonable limits, say, between 30 and 75 per cent relative humidity, in order to maintain fighting efficiency in the man who has become part and parcel — and the brains — of a man-carrying projectile.

All these different and often conflicting conditions can be overcome by ingenious means, and these interceptors, operating in conjunction with the ground control organization, will be valuable defence weapons against crewed aircraft (whether fighters, bombers, or reconnaissance types) and expendable bombers equipped with turbo-jet engines.

They may have to be flown at any height between 15,000 and 18,000 metres (50,000 to 60,000 ft.). That is the snag. For the jet-engine aircraft develops its efficiency according to the Newtonian law that action and reaction are equal and opposite. At 18,000 metres the atmosphere has but one-tenth the density found at 15 metres (50 ft.). The power required to push an aircraft through the dense lower air is far greater than that required to push it through the thin air of the stratosphere. In consequence, near the ground the engine burns three times the quantity of fuel, undergoes most heat and stress, yet the aircraft's speed is hardly any faster, and may, indeed, be slower. The aircraft's duration and range fall. Does this mean that there is a soft spot in the defence?

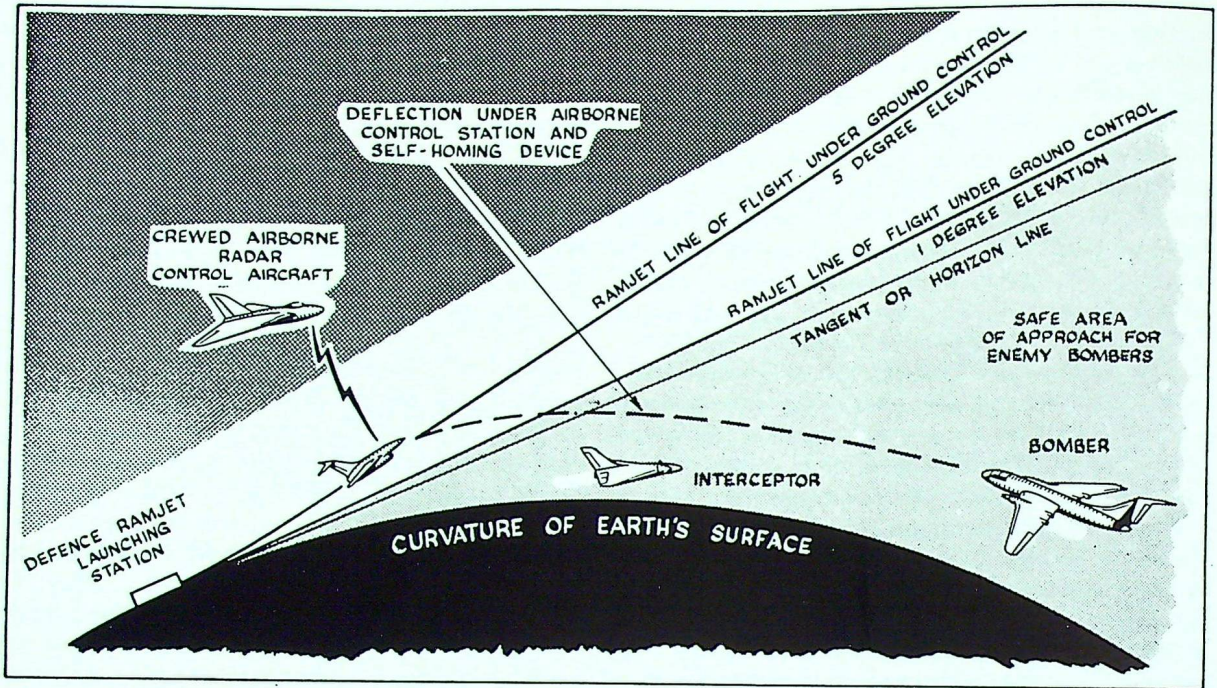
The ground anti-aircraft reporting and control organization depends largely on radar for advance intelligence. Long-range radar impulses and echoes travel in straight lines. They do not bend round the horizon; so they provide intelligence only of aircraft or missiles flying above the horizon of the radar transmitter. Aircraft or missiles approaching

at a continuous height above the curved surface of the earth do not follow a straight path in the vertical plane, and they enter the detection zone of a given radar station only when they emerge above that station's horizon. Hence the lowest-flying attacker avoids detection until the last possible moment. For that reason this form of attack is theoretically the most dangerous in the eyes of a defence commander. It gives him the least time and air-space in which to counter the attack. Against it he can deploy guns (including rockets guns) and interceptor fighters. But the attacker passes through the fore-and-aft firing arc of the gun-line in the shortest possible time, and, in consequence, the gun-belt must be multiplied in depth to increase its efficiency, with a resulting upsurge in industrial and military manpower (and high priority materials) allocated to this purely static defence effort.

Against this form of attack, how can the defence commander scramble his interceptors off when his time of warning is so short? How can he maintain a standing patrol when his fighters' duration at low altitude is so brief?

We must not delude ourselves by the report that on 17 March 1952 two U.S.A.F. Thunderjet fighters based in Germany flew 4,500 kilometers (2,800 miles) in 4 hours and 48 minutes of sustained flight, carrying additional fuel in extra tanks. For no doubt this flight was made at or near the best operation height. At ground level their duration would have been reduced to 1.5 to 2 hours and their top speed would have been no greater than the 940 km/hr (585 ml/hr) stated in the report; and, with the extra tanks' additional drag at low height, the speed might well have been less.

When we consider future interceptor jet fighters (of far greater power than Thunderjets) the problem of fuel becomes acute. Even single-engined turbo-jet interceptors may consume from 5,000 to 9,000 litres (1,000-2,000 imp. gal.) hourly when flying at low height, and the provision of fuel in quantities of this kind becomes a problem of bulk storage in an aircraft whose conception is anti-belly in outline, and whose wings must be thin to attain high speed.



If the ram-jet fighter is launched under the direction of ground-based radar the line-of-sight coverage available to control will leave an open approach to the low-flying bomber. One solution to this problem is to use available radar stations whose sets can 'see' over the horizon and direct the ram-jet fighter on to the approaching bomber while time still remains to make an interception.

Here it appears that the answer may be found in flight refuelling. By this means fighters can be kept airborne almost indefinitely. A Meteor has been kept aloft for 12 hours, refuelling in flight 10 times. I believe the jet fighter duration record is over 14 hours, using refuelling facilities in flight. A tanker has been built which can refuel three fighters simultaneously, and one such tanker is capable of maintaining a squadron of 12 fighters in continuous flight. This method of increasing fighter utilisation seems to provide the defence commander with the answer to his problem of ranging the interceptor against the bomber at all altitudes with the greatest prospect of achieving success. Certainly it introduces another link in the organization of fighter defence, but there appears to be no special difficulty in making it operative if the problems involved are properly tackled. The tankers can be flown by less highly-trained aircrews than the fighters, or by older men less physically fit to stand the strains of combat flying,

or by aircrews during respite from operational tours, or, even, if necessary, by women. By raising the utilization factor of the fighters, defence cover could be provided by a smaller first-line force, so meeting the two military requirements of concentration and conservation of fighting power.

If the defence could afford to provide an interceptor for low altitude interception only, the aircraft could be greatly simplified in equipment, for it would not need the combinations of protection for the pilot to immure him from all the conditions referred to earlier in this article. But it should be able to operate by day or night, and, to provide for the high factor of utilization, the crews should exceed the aircraft in number to the required proportion.

Defence against high-altitude attack will certainly demand the use of human-crewed interceptor fighters while crewed or uncrewed turbo-jet bombers are employed. But the defence against

high-altitude attack can be strengthened more effectively than that against low-altitude attack, and it may be that at the high levels the use of crewed interceptors will only continue during a transition period, which may last for the next 10 to 20 years. During this period high-altitude interceptors can also gain from flight refuelling, for both during climb and descent the high-flying fighter burns up fuel and so curtails its duration. Moreover, by refuelling in flight instead of on the ground, part of the complication of fighter control — their turnover to aerodrome flight control instead of combat control — can be avoided, for combat control should be made operationally responsible for airborne refuelling and for giving any required assistance from the ground to ensure interception between tanker aircraft and fighters.

Ram-jet missiles and rockets will certainly be developed and employed for high-altitude interception. Both can be likened to self-propelling shells. Both have to be discharged by some form of launching-device carrying booster units to give the missiles a high initial acceleration; the launching device will automatically be jettisoned when its usefulness has ceased. Presumably, when used for land defence, the launching-devices will have self-opening parachutes to break their fall, so that they will not cause unnecessary surface damage, and may be recovered intact for another launch.

Ram-jets burn ordinary fuel and rely on atmospheric oxygen for its combustion. They obtain oxygen from the ram effect of their own passage through the air. Two conditions limit the supply of oxygen and (hence) a ram-jet's performance, one being its own speed, and the other the density of the atmosphere. The greatest height at which they are likely to operate is about 90,000 to 100,000 ft., for above that height, in attenuated atmosphere, the molecules of air are spread so far apart that the ram-jet takes them in intermittently instead of in a continuous stream; its power then falls, its combustion temperature drops, and the flame may even die out. Up to that height the speed of ram-jets appears to be limited by their own peculiarities to about twice the speed of sound or perhaps a little more.

The rocket carries its own fuel and provides for its own combustion. The limit of height it can reach is dependent upon the punch built into it. In theory it can defeat the gravitational pull of the earth and pass out of the earth's orbit into outer space. But, for practical foreseeable purposes, we can say its velocity is about four times the speed of sound and its operational height perhaps 200,000 to 250,000 ft.

Interceptor fighters are therefore valueless against attacks by ram-jet and rocket, which may be from two to four times greater in speed than the fighter, and may fly much higher than the fighter can reach.

Defence against air attack thus falls into four vertical zones: (1) guns and small rockets fired from the ground from ground-level up to, say, 6,000 metres (20,000 ft.); (2) interceptor fighters from ground level up to 18,000 metres (60,000 ft.); (3) ram-jet missiles from about 6,000 to 27,500 metres (90,000 ft.); and large rockets from 15,000 to 75,000 metres (50,000 to 250,000 ft.).

An attacker flying at 6,000 metres is detectable at a sufficient distance to give time to deploy the defences, provided the fighters are airborne. Interceptor fighters could form the outermost defence ring against bombers coming in at such a height, for the fighters could fly much higher and be in continuous touch with ground combat control and be directed into combat the instant the incoming force was detected on the radar screen. Ram-jet-guided missiles could not be launched until the incoming force was detected and had continued its flight to a point where the electronic beam directing the ram-jet could be elevated sufficiently above the horizon to ensure freedom from ground interference.

Obviously any plan of enemy attack would take these factors into consideration. The enemy commander should be aware of the distance-gradient along which his aircraft could be detected by the defending radar screen, and at what point above it his aircraft would begin to come under ram-jet missile fire from the ground. He would, therefore, so arrange his flight plan that his attacking aircraft would be briefed to reduce height to keep just below the radar gradient, and so avoid until the

last possible moment the risk of guided missiles fired from the ground.

Every addition in attack height above the radar gradient must lengthen the range of possible detection, provided the attack force has not taken action to blind, confuse, or deceive the radar defences, as R.A.F. Bomber Command so successfully did towards the end of the last war. Unless flight planning of this nature, or radar blinding, are successfully used by the attack force, all its crewed and expendable bombers can be brought under the fire of at least two, and perhaps three, of the available forms of dynamic air defence.

If one assumes that the battle line will lie just below the radar gradient, it is apparent that the highest-altitude interceptors will be required to operate at the greatest distance from the defence ground combat control, and that the inner ring of defence will be forced to rely upon the strength and efficiency of the low-altitude interceptor force against any attack force coming in below the radar gradient; for the operation against them of guided missiles from the ground is impossible so long as the attackers remain below that gradient.

Quite clearly, a country with a mountain frontier is more happily placed in respect of modern air defence than one whose frontier is low-lying. Shakespeare wrote of the England of Richard the Second in these words:

*This precious stone set in the silver sea,
Which serves it in the office of a wall
Or as a moat defensive to a house,
Against the envy of less happier lands . . .*

But today the wall is slighted and the moat over-bridged by air. The silver sea serves the airborne enemy unless England has radar posts upon the waters, or on the Continent, or in the air above them, which will reduce the height of the radar gradient, and bring the lower-flying attackers within radar detection at greater range, so that guided missiles can be used against them from the sea, the air above it, or the Continent. Only so can it be assumed that all crewed and expendable bombers can be brought under the fire of at least two, and perhaps three, of the available forms of dynamic air defence. And it is apparent that the

human-crewed low-altitude interceptor, with its own self-contained intelligence and will, must continue to be a vital part of the defence, and that its chief requirement is increase of range without loss of performance, a factor which, as we have seen, is obtainable only by the properly integrated use of flight refuelling.

Ram-jet and rocket attacks fall into another category. During most of their flight they will travel high above the reach of ground guns and interceptor fighters. Owing to their height of flight, they can be detected at greater range. And they are far less likely to be shielded by radar jamming. But their faster speed shortens the time available to deploy defence against them. When flying high their only foes are rockets and ram-jets designed to home on them. Here is a fantastic picture of a war in the air where robot missiles converge along different parabolic flight paths until they meet somewhere between 25 to 35 km. (15 to 20 ml.) above the earth's surface, and shatter like colliding meteorites. If the attacking robot carries an atomic warhead, the illumination of its disintegrating end may flame into incandescence like the bursting of a nova in outer space.

Whether a future air war (if it ever comes) will take one form or another, or all forms simultaneously, no one can predict with any certainty. The only sure action to take is to prepare to meet and use all forms both for defence and offence. Then, perhaps, the age-old principle of the "fleet-in-being" may deter both antagonists from employing their most deadly and dangerously penetrative weapons. But it is a delusive thought to believe that the "fleet-in-being" can absolutely prevent war from beginning. History records such prevention only when the policies at issue have not been of sufficient importance to stake them on the arbitrament of war. When they *have* been so important, the instrument of war has been wielded as the weapon of policy all through the centuries. In reference to the American Civil War, President Lincoln said in his second inaugural address on 4 March 1965: "Both parties deprecated war; but one of them would make war rather than let the nation survive, and the other would accept war rather than let it perish. And the war came."

Push-button warfare

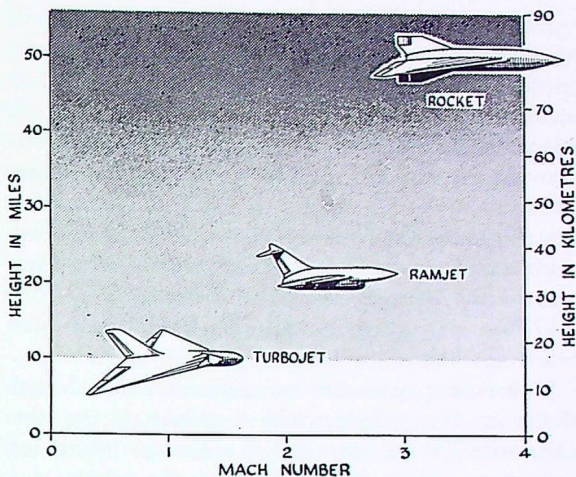
There are those who believe that ultra-scientific warfare is just around the corner. Those say that ere long all crewed bombers will be replaced by expendable bombers which will be cheaper to make, and that, as these expendable bombers will have only the outward journey to make (as did the V-1), their range can equal or exceed that of the equivalent crewed bomber which must carry fuel for the return journey also; but this does not apply if the crewed bomber is flight refuelled. It is suggested that expendable bombers will self-navigate with sufficient accuracy to take them to their targets at long range by orientation on the earth's magnetic field or relative to the heavenly bodies. When near their target areas, they may be designed to home towards some given special objective, and get near enough by means of the robot brain to do serious damage, especially if equipped with atomic warheads.

The unwinged ram-jet or rocket will have a shorter range than the turbo-jet expendable bomber, but a ram-jet or rocket fitted with wings might extend its range to equal or perhaps exceed the expendable bomber's range; so it is necessary to visualize the possibility of all three forms of weapon being used for bombardment at long range. But it is most unlikely that this stage of their development will be reached coincidentally.

I believe it is unpredictable at the present moment when it may become possible to use "push-button" war strategically with tactical accuracy, but there seems every likelihood that it will eventually be both possible and practicable if the peoples of the world are prepared to turn themselves into slaves to work to this end and give up many other far more desirable things which civilization can offer to a peaceful world.

At the present moment we are at the opening of the transitional stage in air-war weapon development. The V-1 and V-2 pointed the way, and marked the beginning of a new military epoch. The pulse-reactor power unit of the V-1 will be replaced by turbo-jets and ram-jets. The rocket motor of the V-2 will be developed to more powerful forms.

In consequence, it is held by some minds that



This diagram shows the regions, both of altitude and speed, in which the three new types of power plant may be exploited. Turbo-jet-driven fighters are already going into production for the R.A.F. and the development of ram-jet and rocket missiles is said to be advanced. Both kinds of missile lean heavily upon electronics for their control and guidance.

future aviation will fall into two broad classes, defined as military and transport. It is probable (as far as can be foreseen at the moment and without access to any secrets) that atomic power when applied to aircraft will be more likely to be used in what would be called the transport class. This type of aircraft, having great duration and carrying power, could act as a battleship of the air, equipped with guided missiles fitted with atomic warheads; it could cruise to any position on the earth's surface, and, if not destroyed or disabled, discharge its guided weapons against almost any target. It might basically be of flying-boat design, and indeed, most probably would use water dromes rather than still larger and more costly land dromes. Unless the world's political problems can be resolved by means other than war before these developments take actionable shape, we shall have arrived at the time when intercontinental air warfare will have become a reality; aircraft will cruise over both continents and oceans with ease and assurance hitherto known only in sea-going fleets, and will dominate the land masses as the oceans have been scenes of contest and domination in the past.

During the transitional period upon which we have already entered, many problems will have to be decided. With the continued military development away from human to robot-controlled air weapons, the question of allocation of responsibility for their operational employment must certainly arise. No doubt this is a subject which has already reached consideration, and must continue to receive further consideration with each progressive change.

Which part of the scientific warfare of the future will best be handled by the R.A.F.?

It seems reasonable to assume that United Kingdom air defence will continue to be the responsibility of the R.A.F., for problems of long-range radar are probably more highly developed by this Service than any other. Moreover, the strategic weapons to be countered would probably have features in common with those developed by British experts, and the Service which was charged with the development and operation of such weapons would be best fitted to organize the defence against those of an enemy.

Expendable bombers and long-range ram-jets involve aerodynamic problems in their design and construction, and would require an organization similar to the control and reporting section of the R.A.F. for their operation, so here again it appears that responsibility should be placed upon the Air Force.

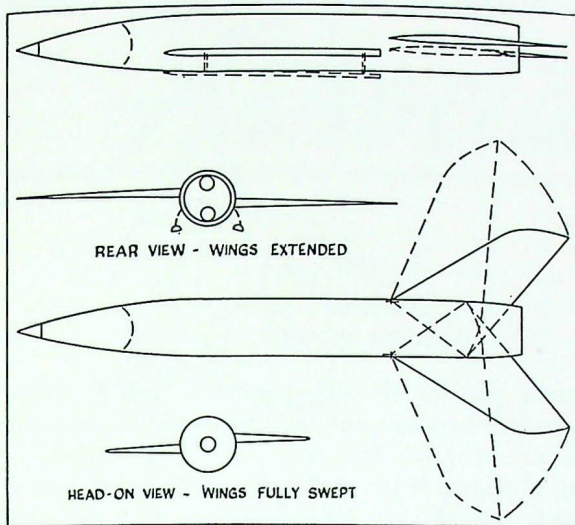
The Army would continue to possess its Anti-Aircraft Command, operating guns against the low-flying attackers, and using short-range guided weapons for the same purpose. As we have seen already postulated above, it is possible that these guided weapons in the Anti-Aircraft Command would be located at stations within the outer defence zone, and perhaps even within the inner defence zone itself. The guided weapons used against attackers at a greater distance may have to be an Air Force responsibility, because Air Force mobility alone might make it possible to deploy them. On the ground this might become a function of the R.A.F. Regiment; in the air (for air-to-air guided weapons) it would be a function of Fighter or Tactical Air Commands, according to conditions. Thus, as between Army and Air Force,

range of attack appears to be the guiding principle for demarcation of responsibility.

The Navy will certainly have the responsibility of operating guided weapons for offence and defence from ships, and, by making use of shipborne aircraft to guide the weapons, may be able to direct a formidable bombardment against an enemy coastal zone from a position where its own ships will be below the radar horizon and so out of radar view. These guided missiles could be discharged to change course in flight towards their targets, thus deceiving the defence as to the direction whence they came, and so providing strategic cover for the fleet concerned. The development of ram-jet and rocket guided and self-homing missiles will give fleets greater protection against air attack than they enjoyed during the last war, and it is therefore probable that their greatest enemy will be the submarine and not the aeroplane. There appears no reason why the submarine of the future should not be able to use torpedoes or mines carrying atomic explosives against both fleets and convoys, and this is likely to have a marked effect on the organization of sea-going stations in war.

Owing to the nature of the problem, it appears to be desirable to allocate all shore defence against air attack to one authority, and that all shore stations and ports should come under one operational command, which should most properly be the responsibility of the Air Force, with both the Army Anti-Aircraft Command and Naval anti-aircraft units operating under one supreme Commander-in-Chief.

So far as the British Isles are concerned, it has always been regarded as a disadvantage that we are so crowded, and all our industries and defence stations so concentrated within a relatively small area. But with the expanding power of defence, which at this moment appears to be overtaking the lead recently held by offence in the air, it may even prove that concentration is not such a disadvantage after all. The attacking weapons must come in over more readily plottable flight paths, and the total volume of defence organization required to deal with them can be concentrated in the relatively small area. Admittedly, if the defence is



An artist's idea of what the interceptor fighter of the future may look like is shown above. This is a rocket-driven fighter with an extremely high rate of climb and intended for direct, or ramp, take-off. The landing is made on the retractable skids. Such a machine would fly at Mach numbers of 2 or 3 and would make much use of body-lift. The wings are intended to have variable and differential sweep, and are mounted at different levels to allow one to overlap the other inside the fuselage when they are in the swept position. The rocket tail-pipes are installed above and below the wings.

penetrated, the concentration of population, industry, and installations is a weakness, but the ability to concentrate defence forces is a source of strength.

During the transitional period of development, fighters and guided weapons, bombers and expendable bombers (of all classes) will continue in use. Thus will continue for many years to come the need for a specialist air force, and, because of their own inherent specialist values, there is no likelihood of the three Services being telescoped into one. The air is now the premier Service in defence and offence; this position is likely to continue unchanged for many years to come. And, if the world does not change its ways, and eschew war altogether, it seems probable that the future air force will be an attack, defence and air-transport force, the future navy a sea-carrying force, and the future army an occupying force. If the weapons are produced which are possible of development,

the warfare of the future may become a long-range shooting war, with atomic guided weapons; and after a country were sufficiently shot to pieces, the army would move in as an occupational force transported by sea and air transport. A scientific return to the ancient methods of knocking down the castle!

Experience of what happened to Germany under air bombardment in the last war indicates that, with certain elements of industry struck out by long-range bombardment, no nation can maintain a war when fighting forces are dependent upon organized industrialization. Although in Germany's case her war effort was directed mainly towards her army, the same principle holds in relation to any fighting force, and no air force could long survive the absence in its industrial support of vital components. Victory in future war may, therefore, depend upon relative efficiency in combined air defence and attack, efficiency of intelligence of the enemy's industrialization (its weakest links and where they are sited), and a sufficient stockpiling of the essential elements of one's own industrialization in advance of war so that the assembly of the finished weapon could not be held up for lack of an essential key part. The indication is that every state must now be continuously prepared for war. There can be no return (in present conditions) to the former British policy of relying upon defence to provide time to build up after war begins. Moreover, it is apparent that the increasing scientific form of warfare will continue to add to its cost and to the burden which every state must bear to maintain itself in a condition of continuous readiness. This is an economic position which can hardly persist indefinitely, for if it does the whole world will be bankrupted in the process, and all mankind will be the poorer, even without war. Whether the Western Allies can attain sufficient political strength through the present policy of rearming to enable the great world states to arrive at some compromise which will prevent war, is not in their hands alone. The world is no more stable than was the United States at the time of which Abraham Lincoln spoke when he used the words —“And the war came”— which I have quoted above.

The Party Is Over

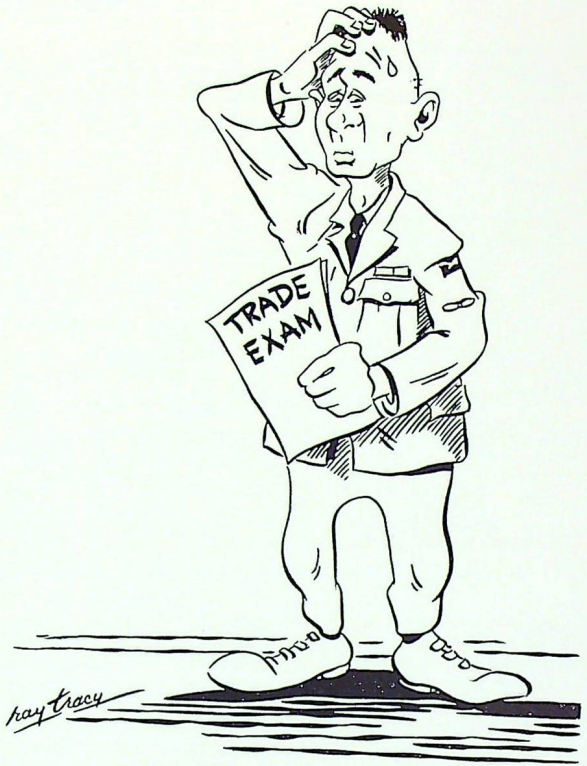
(Reprinted from "The Gimli Gazette": R.C.A.F.)

Yes, as those among you who wrote the September trade board examinations realize, the party is indeed over. For a while it was possible for an individual of average brain power totally to ignore any form of trade training on the unit, and still be able to scrape a 60% mark on the trade examinations, often as the result of generosity on the part of the marking board. The situation degenerated to the point where some tradesmen who failed the examinations were filled with wrath and indignation, believing that after so many months' valiant service in the field they should be automatically rewarded with an advancement in grouping.

Training Command Headquarters was not blind to the situation, and on 15 September they came up with a trade examination that surprised not a few of the candidates. Where were the sure-fire guaranteed questions, such as "What is the 'phone number of the fire hall?" Where were the all-time favourites like "Name four classes of R.C.A.F. equipment?", "What is the speed-limit on the station?" Where indeed?—In the garbage can, friends, where they rightly belong.

Quite a number of heads were reeling during the last examinations. Their owners, being filled with complacency, were unprepared for a test as comprehensive as this. The examination was completely fair, and there was no excuse for the string of complaints that were received. These complaints were merely a cover-up for lack of knowledge.

CAP 471, Trade Specifications, details exactly what must be known in order to advance in grouping. A glance at its contents would have materially helped many candidates. Lifting telephones and asking for "101" might also have helped. ("101," for the benefit of the uninitiated, is the 'phone number of the Trade Advancement Section.)



Where were most people caught? In basic knowledge. They had, to some extent, studied their particular trade specialty; but in most cases had not brought themselves up-to-date on the basic requirements of their trade. Certainly, some of the basic questions were tricky, but a little more study would most probably have meant the difference between a pass and a failure.

Group III offers the successful candidate \$180 a year pay increase, an increase which is not going to be given away for the asking. Take the trouble to learn all phases of your trade, and the next examination will not appear as difficult as the last. There is a ray of hope in the fact that, should you fail an examination, you are entitled to write it again in three months.

The resources of the Educational branch of the station are at the disposal of everybody. Use them freely, attend classes, take the night off for study — and the \$180 is yours!

ROYAL CANADIAN AIR FORCE

Association



NATIONAL PRESIDENT ATTENDS LONDON MEETING

The Third General Assembly of the World Veterans Federation was held in London during the early part of the winter and, on the invitation of that organization, the National President of the R.C.A.F.A., Air Vice-Marshal A. L. Morfee, C.B., C.B.E., attended as an observer.

The W.V.F. was founded in 1950 and claims to represent about 15,000,000 ex-Service men of the Western Nations. Among the member organizations are the Army, Navy and Air Force Veterans in Canada, War Pensioners of Canada, the Royal Air Forces Association, and other British and Canadian organizations, as well as those of many other foreign and Commonwealth countries. The Canadian Legion is not at present a member, but it is of interest that Dr. G. B. Lumsden, Dominion President, also attended the London meetings as an observer.

The stated aims of the W.V.F. included the promotion of welfare and assistance in the rehabilitation of former Service men everywhere, and the promotion of world peace. Much has been done already to further the rehabilitation of those physically disabled by war, through study and exchange of information on equipment, appliances, and training.

More than 100 leaders of veterans from 30 countries attended the Assembly, which was opened officially by Field Marshal Lord Alexander, Britain's Minister of Defence. Goodwill messages were received from many Heads of States and Prime Ministers, including Prime Minister St. Laurent of Canada and Mr. Truman of the U.S.A.

A reception for the delegates was given by the Foreign Office at the residence of Rt. Hon.

Anthony Eden, and the Lord Mayor of London gave a reception at the Mansion House.

The meetings of the Assembly were held in Church House, Westminster, and business was conducted in the two official languages, English and French. Each seat had a pair of headphones, and the delegate could choose which of the official languages he wished to hear as the interpreters translated.

Resolutions approved by the Assembly had been submitted by three main committees on policy, internal affairs, and rehabilitation. Decisions were taken outlining the W.V.F. attitude on former enemy countries, Korea, ex-prisoners of war, and other matters. Resolutions implementing the W.V.F. rehabilitation programme were approved, with a decision to expand the programme to the fullest measure "so as to make the maximum contribution possible to the welfare of the United Nations' disabled veterans." It was reiterated that perhaps the greatest contribution to peace and understanding could be made in this way.

M. Albert Morel of France was re-elected President of the W.V.F. for 1953. Mr. Elliott H. Newcomb of the United States was re-elected Secretary-General, and Mr. W. C. J. M. van Lanschot of the Netherlands was re-elected Secretary-Treasurer. Plans were made for the next General Assembly to be held in Holland.

NATIONAL CONVENTION

Approximately one hundred delegates are expected to be in Ottawa on 25 and 26 May to attend the third National Convention of the Association.



L. to r.: R. Christie; Flt. Lt. B. Onyette; D. Rumble, No. 406 Wing President; L. H. Jenkins; Miss J. Williamson, No. 406 Wing Secretary; H. Allard, Vice-President. ("Daily Nugget" photo.)

Each Wing is entitled to send one delegate to represent its members and an additional delegate for every one hundred regular members, or major fraction of one hundred members, in excess of the first hundred.

All Groups have meetings scheduled before the convention and it is hoped to have reports of these meetings for the next issue of "The Roundel."

Business to be taken up at the convention includes the report of the National Executive Council, the ratification or confirmation of by-laws, the report of the auditors, the election of the National Executive Council (exclusive of Group representatives on the Council), and other business such as the consideration of resolutions, etc.

FIRST PRESIDENT OF WINNIPEG WING DIES

The Association lost one of its most ardent supporters with the death of E. O. W. ("Ernie")

Hall in Winnipeg. Mr. Hall was the first president of the Winnipeg Wing and had maintained a keen interest in Association affairs even during his illness.

Mr. Hall served in both World Wars and retired from the R.C.A.F. after the Second World War with the rank of Wing Commander. He was the first to fly the Canadian Rockies when he took a Jenny aircraft into British Columbia shortly after the First World War.

Members of the Winnipeg Wing attended the funeral service.

NORTHERN ONTARIO TOUR

Ralph Christie, Ontario Group Northern Representative, and L. H. Jenkins, executive assistant, National H.Q., accompanied by Flt. Lt. G. C. Onyette, officer commanding the North Bay Recruiting Unit, made a tour of Northern Ontario

Wings. The purpose was three-fold: to discuss proposed reorganization of the Ontario Group, to revive interest in languishing Wings, and to assess prospects for new Wings.

The score: two new Wings and one Squadron probable. Two inactive Wings will also be reactivated.

Preliminary organization for a Wing was set up at Sault Ste. Marie and in the Rouyn-Noranda area, and Sturgeon Falls will form a local "Squadron" identified with the North Bay Wing.

Commander R. H. Stokes-Rees, former designer of special weapons in the Royal Navy, giving a talk to No. 306 Wing.



Officers and Directors of No. 302 (City of Quebec) Wing. Seated (l. to r.): Rev. W. F. Butcher, P. J. Haberlin, Armand Lavigueur (President), Maurice Manuel, W. N. Le Gallais. Standing: P. J. Delaney, Paul Gelly, R. Lecours, Miss A. Bélanger, Gérard Asselin, Leopold Villeneuve, R. Dorval, Jacques Baily





A Christmas Party was held by No. 304 (Beaver) Wing for the deaf and dumb Boy Scout Troop of the McKay Institute, Montreal. R. E. C. Binns, Wing President, stands beside Cpl. Archer, R.C.M.P., who is Scoutmaster of the Troop.

A review of recent activities and progress was given to Wings at Timmins, Kirkland Lake, New Liskeard, North Bay, and Sudbury.

At Timmins, the honorary chaplain (Prot.), Archbishop R. J. Renison, Anglican Metropolitan of Ontario, was host to the visitors and Wing executive at "Bishopstope," and he later attended the general meeting in the Canadian Legion hall.

A particularly large gathering turned out at North Bay, and the Wing was told that much was expected of it as "Leader" Wing for the northern area.

WING DUES

Wings have always had the right to charge Wing dues in addition to National dues if the majority of members decided it advisable to do so. Some Wings levy such dues, while others do not. Thus, when a life member or a member-at-large joins a Wing, he is subject to any additional dues the Wing may charge.

This explanation is given because quite a few persons joined recently as members-at-large and

almost immediately became members of a Wing. Some of them have been puzzled as to why they have been asked to pay extra dues.

WITH THE WINGS

Kingston. Good progress on its new quarters is reported from No. 416 (Kingston) Wing, and several social functions have been held in the new premises. Wing members carried out all the renovations, and those who were not able to help manually, aided the cause with donations to the Booster Fund.

Oshawa. The new president of No. 420 (Oshawa) Wing is C. A. Parkin, who was elected at the annual meeting held recently. K. G. Whattam is the secretary, and A. B. Burr the treasurer.

Kitchener-Waterloo. The guest speaker at a meeting of No. 404 Wing was Sqn. Ldr. J. Jaworski, A.F.C., of the Institute of Aviation Medicine in Toronto. Sqn. Ldr. Jaworski, who has been closely associated with test and development of all types

of safety and survival equipment, gave a most interesting talk. Also speaking at the meeting was Air Vice-Marshal G. E. Brookes, C.B., C.B.E., Ontario representative on the National Executive Council.

Saint John, N.B. Members of No. 250 (Saint John) Wing gathered on the "Empress of France" to bid "bon voyage" to forty-three R.C.A.F. men and thirty-four dependents who sailed for overseas. Gifts were distributed to all the Service personnel, their wives and children. Arrangements for the farewell party were made by E. B. Fitzgerald, past president of the Wing.

The Saint John Wing has also taken steps to reactivate the local flying club, which has not been in operation for some time. A committee under the chairmanship of Bruce Carter has been set up to investigate the situation, and the Wing hopes to have aircraft flying by the spring.

Vice-President Norman Jackson is acting president of the Wing on account of the resignation of P. F. Connell, who has been transferred to Fredericton.



Executive of No. 201 (Confederation) Wing, Charlotte-town. Front row (l. to r.): R. F. Eddy, S. M. MacInnis, J. A. Carruthers, G. H. Wood. Back row: W. S. Chandler, A. D. Seaman, H. H. MacKee, W. S. MacLeod, G. R. Howard.

Newmarket. Robert Houston was elected president for 1953 of No. 421 (Newmarket) Wing. Other officers are Roy Penrose and Robert McCabe, vice-presidents; Howard Fry, secretary-treasurer; and Herbert Lawrence, George McNelly Red Atkinson, and Harry Markham, additional members.

LET'S HAVE IT!

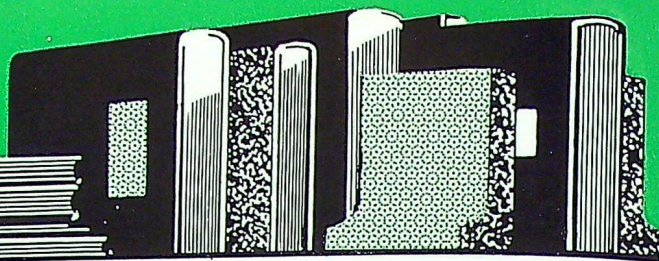
Complacency is the deepest pitfall that lies in the path of an Editorial Committee. Even though there are seven members on the Committee of "The Roundel," and even though they are changed from time to time, they constantly stand in need of being stirred up a bit.

The only way to stir up an Editorial Committee is to tell it where, in one's personal opinion, it is falling down on its job. Seven men cannot possibly divine all the reactions of an estimated 100,000-odd readers, but they can get a rough idea of how things stand if only 1 per cent of those readers write in to give their uninhibited views on the matter.

You probably have your own thoughts on what should go into an Air Force official magazine (as opposed to a Station newspaper). We would very much like to hear them.

But please bear in mind that what we want is criticism, in the fullest sense of the word. The most helpful letters received, whether they praise "The Roundel" or rip it to pieces, will be published each month in "Letters to the Editor."

Book Reviews



The Long Road to FREEDOM

A Book Review by Wing Commander F. H. Hitchins, Air Historian

Paul Brickhill.



MR. BRICKHILL, author of "The Dam Busters," the story of No. 617 Squadron, has also written two books, "Escape to Danger" and "The Great Escape," relating the experiences of airmen prisoners of war who sought to regain their freedom. Now he has added a third to the series. "Escape — or Die,"* a collection of eight stories, differs from its predecessors in the wide range of experiences described. The stories cover virtually the whole field of escape areas — the jungles of Indonesia, the wastes of the Western Desert, the mountains of central Italy, the farms and villages of France, the marshes and canals of Holland, the prison camps and ports of Germany, and the forests of Poland. Unlike "The Great Escape," which ended in tragedy, the stories in this book all have a happy ending; the men won their way back to freedom.

Mr. Brickhill narrates his seven stories (the eighth is told in the escaper's own words) simply and soberly. There is no attempt — and no need — to dress them up as melodrama. The experiences

*Paul Brickhill: "Escape — or Die. Authentic stories of the R.A.F. Escaping Society." With a commentary by H. E. Bates, and a foreword by Air Marshal Sir Basil Embry, K.B.E., C.B., D.S.O., D.F.C., A.F.C. Pp. 223; illustrated. Price: \$3.50. British Book Service (Canada) Ltd., 263-267 Adelaide Street West, Toronto, Ont.

of the eight men supply their own drama in full measure. Each tale has a brief preface, giving some details about the escaper's career before he fell into enemy hands; and each has a postscript telling the sequel to his escape and what he is doing now. Three of the men are still with the R.A.F.; another was killed in a flying accident while the book was being compiled. The stories are illustrated with "before and after" photographs of the eight escapers.

Differing widely in their geographical setting, differing in their characters and circumstances, the stories nevertheless have a common undercurrent or theme of courage, resource and, above all, stubborn determination — that characteristic British trait which is expressed in the phrases "never say die," "he's dead but won't lie down," and "they don't know when they're licked," a trait which Mr. Bates in his introductory commentary has aptly termed "pure cussedness."

But more than "pure cussedness" was necessary. In every escape saga, luck — both good and bad — played an important part. Sometimes the luck verged on, if it did not actually merge into, the miraculous. The sudden appearance of a Dutch flying-boat when all hope, and life itself, seemed at an end; a chance encounter with a scout car of the Long Range Desert Group: a casual query from a passing Danish sailor — on such one-in-a-million chances hung the escaper's fate. If anyone doubts that truth can be stranger than fiction, he will find ample proof in the pages of "Escape — or Die."

The book takes its title from the first story, telling the experiences of Charles McCormac. Captured by the Japanese when Singapore fell, McCormac soon learned that for him the choice was either escape — or die at the hands of his sadistic captors. How he made the break, with sixteen companions, and how five months later two of the group finally reached Australia is a narrative that must be unparalleled in the annals of escape. Mr. Bates calls it "an epic of sheer blazing resolution . . . perhaps the most horrifying and amazing escape of a war that was probably richer in escape stories than any war that was ever fought."

Unlike "The Great Escape," "The Wooden Horse," and most other escape books, the emphasis in the stories in this volume is not on the actual escape from prison camp (in most cases it was quite simple) but rather on the more difficult task of evading recapture and reaching free territory. And, in six of the eight escapes described, the final victory was due to men and women who helped the escaper on his way. They came from all classes — shopkeeper and schoolboy, farmwife and butcher, priest and prostitute — and they, one might say, are the real heroes of the book. The escapers had nothing to lose but their freedom — for a time; their civilian friends were gambling for keeps — with their lives.

It is this background which is perhaps the most significant feature of Mr. Brickhill's book. Air Marshal Embry (whose own escape experiences have been described in "Wingless Victory") gives the setting in his foreword:

"The fact that so many R.A.F. prisoners of war managed to escape . . . and that so many shot-down airmen successfully evaded the enemy was due partly to escape-training and partly to the efforts of thousands of civilian men, women, and even children. Many of these civilians, living in their own countries under a régime of terror, helped our men with a most remarkable cold-blooded courage. Often they risked much more than the escaping or evading airman. If the airman were caught he would become a prisoner of war, but the civilians who helped him faced sudden death and torture.

"At the end of the war the Royal Air Force Escaping Society . . . was formed as an act of gratitude by those who got away . . . to repay some part of the debt we owe to our former civilian allies, especially to the widows and orphans of those who died trying to help us . . .

"Already we have brought many orphans to this country for a holiday. We have helped widows afflicted by sickness or want. We have managed to give a training for a career to some of the sons of the heroes whose sacrifice it was to help our cause."

It was "to help to provide much-needed funds" for this work of the Escaping Society, of which Air Marshal Embry is chairman, that "Escape — or Die" was written.

The postscripts to two of the stories in the book underline Sir Basil's words. One airman who was helped by Italian partisans found, on a return visit to that country, that two of those who aided him had been put to death and another barely escaped that fate. A second airman who evaded capture, thanks to the French Underground

organization, learned that at least six of his benefactors and guides had been executed and another crippled for life.

As a tribute to these gallant men and women, Mr. Brickhill's interesting volume should command a large audience. The Canadian reader may

lay it aside wondering if there is an R.C.A.F. counterpart to the R.A.F. Escaping Society and what tales its members could tell, not only of their own adventures but also of the work of Pierre and Jan, Luigi and Anna, Griselda and François, the friends whom they met along the way.

Lac St. Denis Ski Club ★ ★ ★

Last November the personnel of No. 1 Air Defence Control Centre, at Lac St. Denis in the heart of the Laurentian ski district, organized an R.C.A.F. ski club which now has more than 125 members. Three floodlights illuminate the station's ski slope, on which a tow operates, and there are several more difficult slopes within easy touring-distance. Under the leadership of its President, A.C.1 Barry Ormiston, the club has become an important feature of station life. It is affiliated with the Ski Club of nearby Morin Heights, and its members are thus able to enjoy conducted ski tours and the use of tows, at reduced rates.

On the station slope. Louis D'Ambroisio (left) and Flying Officer E. Sauvé.



Homeward bound. L. to r.: A.W.1 Doreen Griffiths, LAW Robbie Roberts, Cpl. June Todhunter.



Off for the afternoon. L. to r.: Conrad La Fleur, A.W.1 Flo Michel. On steps: A.C.1 Emil Chauvan.



Vive la Chasse!

By Flying Officer J. R. Howey, No. 416 (F.) Squadron, Grostenquin.

Not very long ago Flying Officer Bill Worthy and I celebrated the opening of the French hunting-season as guests of the Champigneulles Hunt Club of Nancy, France.

Being familiar with hunting in Canada, we were very interested in the French system. Hunting in France is rigidly controlled. All hunting-rights to a certain area are controlled by one person, who collects a fee for granting permission to hunt in that area; and farmers over whose land the hunt takes place must also receive remuneration. Membership in a hunting-club is therefore quite an expensive luxury. In addition, all hunters must obtain a hunting-permit.

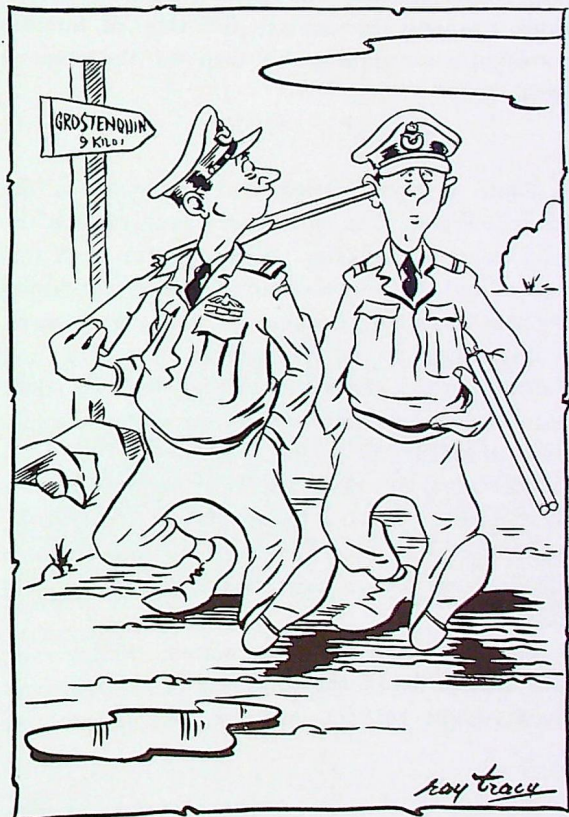
The hunt began, at eight o'clock on a Sunday morning, with the gathering of all the enthusiastic participants in the lobby of the Hôtel du Palais de la Bière, in Nancy. The hunters — or rather the *chasseurs* — were all smartly dressed in riding-breeches, boots, sports jackets, and hunting-caps or fedoras. They resembled a riding-party more than a hunting-party. Their guns were all 12-gauge shotguns of post-war design, as the Germans confiscated all firearms during the occupation. Slugs or buckshot were used for wild boars and deer, no.2 or no.4 shot for rabbits, and no.6 shot for birds.

From the hotel we motored some thirty miles to the village of Bioncourt, in the Moselle region east of Nancy. Here it was that the hunt was to take place.

* * *

The greater number of participants there are in a hunt, the more the French enjoy it. Thus, some forty hunters, including two women and ourselves, plodded down a muddy lane to meet their chief

traqueur, or beater, at the first of the designated hunting areas. (The *traqueurs* are usually farmers hired to flush the game from woodland areas and steer it towards the hunters. Their chief, dressed in a dark brown corduroy suit and sporting bronze miniature French horns on his lapels and cap, is responsible for positioning his men and for the collection and cleaning of game. The chief *chasseur* is in charge of the entire expedition.)



We were informed that the thirty-five *traqueurs* were in position and that the hunt could commence at any time we pleased. The chief huntsman thereupon divided his party in two groups which, under the direction of himself and his deputy, were evenly spaced around the woodlot to be hunted. When everyone was ready, signals were given with hunting-horns, and the beaters began to make their way through the bush, kicking up all the noise they could, and driving the game from its sanctuary to meet death under the leaden hail from our guns.

Wooded areas were scoured for game in the morning, and after a very enjoyable meal in a local village, Bill and I were initiated into the French method of hunting in open areas. The open land is surrounded alternately by a hunter and a beater, and, when all are in position, the hunting-horn sounds a general advance. Closing in from all sides towards the centre, the ring of hunters constitutes an unescapable trap for the doomed game.

* * *

Game is both varied and abundant in the Moselle region. The most prized game of all is the wild boar, or *sanglier*. Wild pigs thrive in this region, and they increased to such an extent during the war that they became a menace to farmers' crops. Since the war, however, poachers, and hunting-parties have drastically reduced their number; and our failure to locate any was something of a disappointment.

Less plentiful than the boar, and strictly a denizen of the bush, is the small deer (*chevreuil*), while the more proletarian *gibier* includes jack rabbits and cotton tails, foxes, pheasants, and partridges.

After a day of suspense, action, chilling rain, and muddy fields, the total bag of the hunt was twenty-eight rabbits, one fox, one falcon, two

partridges, and three deer. No. 416 Squadron, I regret to say, went home empty-handed.

* * *

At dark the sportsmen returned to the Hôtel du Palais de la Bière to wind up the hunt in the true French fashion — with a sumptuous feast. A private dining-room, adorned in the sporting tradition with animals' heads and stuffed birds, provided the setting for the gastronomic chapter of the day's adventures.

It began with a toast to the success of the hunt, which was drunk in a very excellent Alsatian wine. Then, after an appetizing cocktail, known as a "*Retour de la Chasse*," the meal commenced with *potage tortue St. Hubert*, a very rich and tasty turtle soup. Second on the menu was a baked trout complete with head and tail drowned in a sauce of shrimp, snail, and mushroom. This was followed by a *perdreau au nid flambé à l'Armagnac*, or baked partridge. After eating a whole partridge each, the R.C.A.F. was suffering from an acute loss of appetite — and yet the repast was only half over. A vegetable dish, *pommes croquettes en cartouches*, was served next, followed by a *salade Réjane*, an asparagus salad. The next course was delicious cheese, after which came a *coupe Hallali*. A fruit dessert concluded the feast. Each course, I might add, was served with a different sort of wine, and a small army of waiters saw to it that no glass was ever empty for more than a few seconds.

* * *

Thus ended our first experience of a hunt in France; and though Bill and I would still rather like to see a *sanglier*, our disappointment at having failed to do so was far more than outweighed by the unsurpassed kindness and courtesy of our hosts.

SONIC TERMINOLOGY ★ ★ ★

Much in the news of late has been to do with various aspects of high-speed flying; and for some years past "sound barrier" has been almost a household term. So much so, in fact, that there is more confused thought and misconception circulating on this subject than almost any other. Surely it is about time that this barrier bogey is laid once and for all — at best, it is a misapplied analogy; and at worst, it is most definitely misleading to the uninitiated.

In the sense in which the term is almost invariably used, "sonic barrier" is made to conjure up a picture of some tangibly physical opposition to forward motion. This mysterious barrier is "smashed," "pierced" or just plain "broken"; on at least one occasion it has been "shattered." And it is frequently turned into a "wall."

Never before has so much confusion resulted from an honest attempt to simplify a complicated

phenomenon and to describe it in everyday language. Is it not true to say that all this arose out of a Press conference held soon after the War, during which some of the problems of high-speed flight were explained? The phenomenon of compressibility drag rise — the sudden increase in drag coefficient which occurs at speeds in the region of that of sound — was discussed. This aerodynamic handicap was stated to represent something of a barrier to progress towards the attainment of speeds higher than that of sound. "The Speed of Sound" and "Barriers to Progress" — key words indeed! And now we seem to be stuck with a "sound barrier."

There have, incidentally, in recent weeks, been dark hints of even further obstacles, to wit, a temperature barrier. No doubt in due course this will be described as a wall of hot air.

(Letter to "The Aeroplane": U.K.)

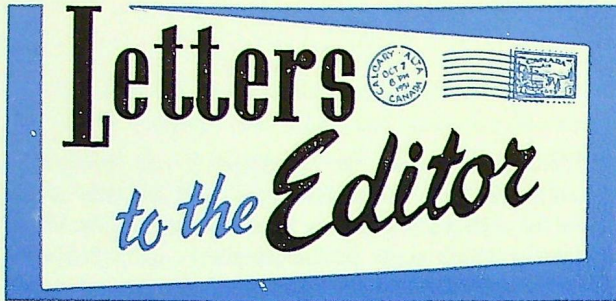


R.C.A.F.'s FIRST PEACETIME D.F.C.

Flt. Lt. E. Glover is the first member of the R.C.A.F. to be awarded the D.F.C. when his country is officially at peace. While flying with the U.S.A.F. in Korea, he destroyed three MIG-15's and seriously damaged two others. He is now serving at R.C.A.F. Station Uplands as a flight commander in No. 422 Squadron.

Flt. Lt. E. Glover, D.F.C.

Letters to the Editor



AIR FORCE RANKS

Dear Sir:

To an oldtimer, two articles in the January 1953 number of "The Roundel" were of particular interest.

First, "Ranks in the Commonwealth's Royal Air Forces." One is reminded of the rank titles suggested, facetiously no doubt, by C. G. Grey, then editor of "The Aeroplane." It would probably be early in 1919 that he came out with "Flew-tenant" for Lieutenant, "Flaptain" for Captain, and "Squad-jor" for Major. I do not recall that he indicated titles for higher ranks.

Second, there was the reprint from "The Aeroplane" on "First Atlantic Crossings." By an odd coincidence, the "Vancouver Daily Province" carried concurrently a column on the same topic by your old friend Eric Nicol. I enclose it herewith. Eric Nicol, by the way, recently remarked in his column, à propos of a notice of the Beaux Arts fancy dress ball, that he "hadn't had on a fancy costume, except for a few years in the Air Force, since school-days."

V. Randolph Clerihue (R.C.A.F.A.)

(We are reprinting Mr. Nicol's article in this issue, and thank Mr. Clerihue for having drawn it to our attention.— Editor.)

"PIN-POINTS" REPLOTTED

Sir:

I have noticed the photographs on page 13 of the January issue, entitled "Pin-points in the Past." The photograph of the two Vedettes is of particular interest to me because the aircraft, "Wild Oscar" and "Wild Nellie" as we affectionately called them, belonged to No. 5 Photographic Detachment. The photograph was taken in 1931 at the Ontario Provincial Forestry Dock at Longlac, Ontario.

I am reasonably certain that I am one of the two airmen in the picture, and I was wondering if it would be possible for you to obtain an original print for me, probably on a slightly larger scale, to see if positive identification is possible.

At the time the photo was taken, the personnel of "Foto 5" were Air Cdre. M. Costello (then Flt. Lt.), Sqn. Ldr. G. E. Miscampbell (then Sgt., since deceased), W.O.1 "Johnny" Walker (then Cpl., now retired), Flt. Lt. Harry Baxter (then LAC), and myself (then LAC).

In the photograph of Victoria Beach you identify a "2nd AM T. Couper." Probably it is a typographical error, but the name should have been spelled "Cooper." Tommy, at the time of his retirement following the Second World War, was Wing Cdr. Thomas Cooper, O.B.E., Commanding Officer, No. 8 Repair Depot.

Wing Cdr. R.F.E. Kempster,
C.J.S. Washington.

(We thank Wing Cdr. Kempster for his corrections and additional information.— Editor.)

Answers to "What's the Score?"

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

A carefree head is to be found only on a scarecrow. (Turkish proverb)

The Laws of the Air Force

The author of the following verses, which derive from Rudyard Kipling's "Laws of the Jungle," is unknown. The official phrase in the ninth verse, however, suggests an R.A.F. origin.

*Now there are the Laws of the Air Force, descended from
Barrack and Ship,
Which he that is wise shall observe — lest his foot on
the ladder may slip.*

*As naught must outclimb us in fighting, e'en so with the
law and its span;*

*For the strength of the man is the Service, and the
strength of the Service the man.*

*Take heed what ye say of your Rulers, be your words
spoken softly or plain,*

*Lest a bird of the air tell the matter, and so shall ye
hear it again!*

*If ye labour from morn until even, and meet with re-
proof for your toil,*

*It is well. That the gun be restrained, the compressor
must check the recoil.*

*On the strength of one link in the cable dependeth the
might of the chain:*

*Who knows when thou mayest be tested? So live that
thou bearest the strain.*

*When the 'plane that is tired returneth, with the signs
of the air showing sore,*

*Men take her in hand for a season, and her speed she
reneweth once more.*

*So shalt thou, lest perchance thou grow weary in flying
from morn until eve,*

*Pray for rest — for the good of the Service — and wend
thy way softly on leave.*

*Count not upon certain promotion, but rather to earn
it aspire.*

*Though the sight-line shall end on the target, there
cometh perchance a misfire.*

*Canst follow the track of the dolphin, or tell where the
sea-swallows roam?*

*Where Leviathan taketh his pleasure? What Ocean he
calleth his home?*

*Even so with the words of the Rulers and the orders
those words shall convey.*

*Every law is as naught besides this: "Thou shalt not
criticize, but obey."*

*Saith the wise: "How may I know their purpose?"
Then act without wherefore or why.*

*Stays the fool but one moment to question, and the
chance of his life passeth by.*

*If ye win through an overseas bomb-raid, unmentioned
at home in the Press,*

*Heed it not. No man seeth the piston, but it doth its
own work none the less.*

*If they growl and the work be retarded? It is ill, be
whatever their rank.*

*The engine may miss yet still function, but can a misfire
turn the crank?*

*Doth the airframe make war with the cowlings? Do the
wings to the engine complain?*

*Nay, they know that some work and a polish unites
them as brothers again.*

*So ye, being Heads of Departments, may growl, but a
smile in due course*

*Will keep ye from strife and from anger and strengthen
the might of your Force.*

*Dost think in a moment of anger 'tis well with thy
Seniors to fight?*

*They prosper who burn in the morning the letters they
wrote overnight.*

*For many lie shelved and forgotten, with nothing to
thank for their fate*

*Save that which, with lack of reflection, they once "had
the honour to state."*

*If the circuit be crowded with 'planes diving downwards
the hangar to win,*

*It is meet that, lest any should suffer, each pilot pass
cautiously in.*

*So thou, when thou nearest promotion, and the peak
that is gilded is nigh,*

*Give heed to thy words and thine actions, lest others
be wearied thereby.*

*It is ill for the winners to worry. Take thy fate as it
comes with a smile;*

*And when thou art safely gazetted, they'll envy, but
may not revile.*

*Uncharted the bumps that surround thee. The wise
man to meet them will learn,*

*Lest his name serve as mark on a tombstone — or else
the Court Martial Return.*

*Though the engine escape from the ack-ack, the air-
frame shows scars on the side.*

*It is well if the Court shall acquit thee, but better
thou hadst not been tried.*

*As the cloud rises over the wind screen, drives past, and
is lost in the wake,*

*So shall ye drop astern, all unheeded, such time as
these Laws ye forsake!*

The
ROUNDEL