



The ROUNDDEL

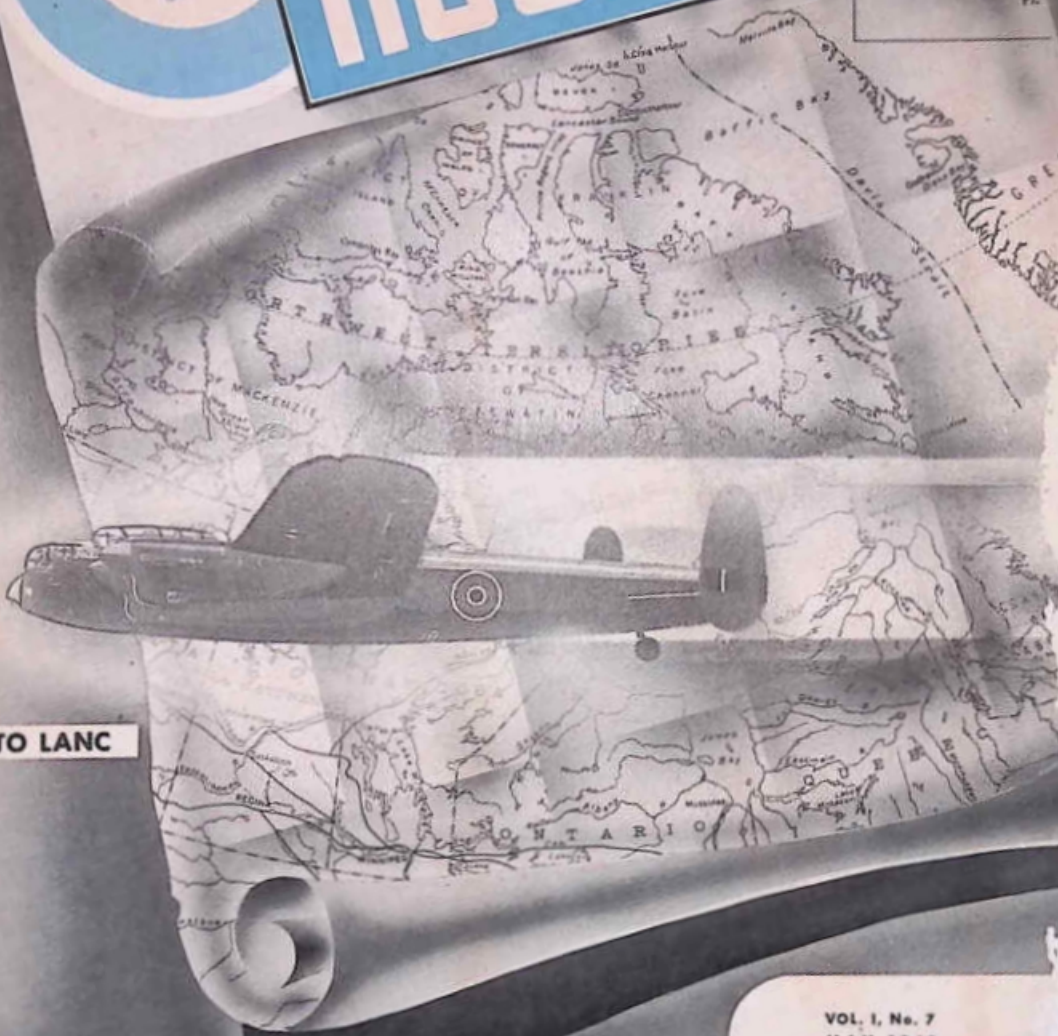


PHOTO LANC

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ROYAL CANADIAN AIR FORCE



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SHATTERPROOF takes a STAND

THROUGH THE OPEN WINDOW the Spring sun played gently down upon the editorial bald spot. Muted by intervening buildings, the murmur of Ottawa floated in to mingle with the whisper of Tracy's air-brush. From Hildegard's corner, where that invaluable maiden was busy preparing the mid-morning brew, there came a musical chime of tea-cups. To put it in a nutshell, the scene was one of peace and constructive thought.

But not for long.

Hunters have told me of the hush that falls over the jungle at the approach of the King of Beasts. Just such a silence it was that descended upon our office as we suddenly became aware of a measured tread echoing towards us along the corridor outside. Tracy's air-brush stopped its little song. The eager red pencil halted in the act of sorting out a split infinitive. Even the tea was shocked into a momentary defiance of gravity on its way from spout to cup. For there was in those footsteps, familiar though they were, an inexorable ring that made me think of the statue of Don Juan's father-in-law stalking from its pedestal to take a spot of long-overdue disciplinary action. We exchanged glances, and waited.

A few moments later Sgt. Shatterproof appeared in the doorway. Without pausing for his usual preliminary survey, he advanced straight to my desk, and saluted. His pipe, I noticed, was not lit; and his eyes, never exactly sparkling with the light of pure fun, were hard and narrowed.

"Glad to see you, Sergeant," I said, "Have a chair."

He shook his head.

"What I have to say, sir, is best said standing. We are no longer looking at Shatterproof the Kindly Critic: we are looking at Shatterproof the Fighter—and Shatterproof fights best upon his

feet. But first I must thank you for your wire to the CO about those signals I sent you last month. He dismissed WO1 Gallstone's charge of improper use of Service signals and merely cautioned me against excessive zeal. I did not argue the matter."

I was about to murmur something when he lifted a warning finger.

"But do not think that I shall relax my vigilance, sir. I appreciate your action, but—we Shatterproofs are incorruptible. I shall not lay aside my sword until 'The Roundel' has become a magazine."

He stared at me, breathing deeply. Not knowing quite what to say, I asked: "And how is LAC Bladder?"

Shatterproof's stern gaze softened. He sighed like a hairy mammoth watching the ice age closing down over its favourite mud-wallow.



"LAC Bladder? I am worried about the boy. He is still not well. The small matter of biting the CO in the calf was cleared up by Squadron Leader Purger, the SMO. He pointed out at the enquiry that a man in LAC Bladder's overwrought state of mind might easily mistake the CO for a bull. He himself, he said, had frequently been struck by the resemblance. So Bladder was ordered a complete rest for two weeks."

"And that didn't fix him up?"

Shatterproof sighed again.

"Not entirely. A week ago he began learning jiu-jitsu under the direction of Flying Officer Backflip, the Sports Officer. The SMO thought it might help to restore his self-confidence. Two days ago they had to discontinue his training. The guard found him practising breakfalls on the parade ground at midnight, shouting out 'Banzai!' every time he hit his nose on the concrete. They have now put him on to leather-work in the hobby shop. He is making Flying Officer Backflip a hand-tooled wrestling mat."

Shatterproof's voice broke a little on the last word. He stood for a moment lost in thought. Then he squared his shoulders and in firm tones said:

"But enough of sentiment. There is work to do. May I see the copy for the June issue?"

I handed it to him and went on working while he leafed through it. Presently he grunted ominously and put it back on the desk. His face was set in grimmer lines than ever.

"Worse even than I feared. The Brass leaves me no alternative. My back is against the wall. The time has come for Shatterproof to take his stand."

He drew from his pocket a protruding scroll of paper bound with a frayed piece of parachute shroud. As he unrolled it, he said:

"I must request you, sir, to pass this to the Brass under the provisions of KR(Air), para. 405, Redress of Grievance. First, however, I shall read it to you.—And you, young woman," he added over his shoulder "had better take it down. It is a historic document."

He cleared his throat and began:

"Gentlemen:



"One score and five years ago there enlisted in this Air Force a man dedicated to the proposition that the boys in the field know best.

"I, gentleman, am that man. I speak as one upon whose shoulders the mantle of high office has more than once been laid. Twice I have served His Majesty as a WO2, and thrice as a Flight Sergeant—and but for the jealousy of certain Warrant Officers who shall be nameless, I might even now be sitting at your conferences and guiding your decisions.

"Who was it, I ask, who first suspected the Mad Adjutant of introducing cockroaches into the Christmas pudding? Who was it whose calm counsel prevailed upon the Cannibal Cook to turn vegetarian? All that, you may say, is ancient history. You may say that those were trifling incidents in the brawling youth of a great Service, that cooks' assistants were plentiful, that a seasoning of cockroaches never hurt anyone. I will not dispute the point. I remind you of these things simply to show that the interests of the boys in the field have ever been closest to my heart.

"Six months have elapsed since first I represented to the Editor of 'The Roundel' the desperate plight of these same boys in the field. In vain I have painted for him the desolation of their lot, deprived of cheesecake, of jokes, of all that makes life worth living. I have shown them to him, brooding in their barracks and Messes, wondering day and night what disasters may have overtaken their old comrades on other Stations. Has Joe been sucked into a jet? Has Bill given up the unequal struggle and got married? Has Charlie gone the way of so many gallant lads and been posted to AFHQ? They have no means of finding out. They must grope blindly on in the dark. For your Editor has turned deaf ears to my entreaties and continues to plunge them into ever greater gloom with descriptions of Waterspouts, Cross-Wind Landing Gears, and the housing situation in—of all places—Prague.

"Let us look ourselves in the faces, gentlemen— we upon whom the mental well-being of these poor boys depends. Let us ask ourselves this question: what are the things that really interest us?

"Our chief interest, of course, is —"

At this juncture I stood hurriedly to my feet and raised my hand.



"Stop, Shatterproof! You need go no further. All is well. Arrangements have already been made. A Service News Section starts in the June issue."

He lowered his Address. Methodically he rolled it up, retied the parachute shroud, and returned it to his pocket. Then he drew himself up to his full girth—and I could have sworn that the mark of the vanished crown glowed faintly on his sleeve.

"It has been a hard fight," he said quietly, "but I have won. Tell the Brass that they will find me a generous victor. None but ourselves need know what has passed in this office."

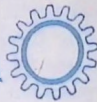
So saying, he saluted, turned on his heel, and marched away without a backward glance. . . .

Again the Spring sun shone gently on the editorial bald spot. Again the tea-cups tinkled as Hildegard gathered them into her filing-basket. The distant life of Ottawa resumed its murmurous duet with the air-brush. Once more all was peace and constructive thought.



MAN

as a Machine



Excerpts from a talk by F. G. SHOEMAKER,
General Motors Corp.

(Courtesy of "S.A.E. Journal")

As ENGINEERS we all have a fairly accurate knowledge of the numerical value of the various units of work, energy, heat, and force. Personally, I am almost perfect in this respect since all the important units and their values are shown in neat tables on the back of my slide rule. But I always have had difficulty in getting a satisfactory physical concept of these units.

How big is an erg? What sort of a stream is a flow of 10 amp? How many Btu's in a tea kettle? And entropy! Whenever I see the word entropy I think of what happens when a snake swallows its own tail. A mathematician evidently got to wondering about that too and added another snake loop through the first one and called the result enthalpy.

I'm confused.

Let's consider horsepower.

It has been stated that a good healthy man has an 8-hr rating of about $\frac{1}{4}$ hp. This is equivalent to carrying 396 bags of cement up a 100-ft hill in 8 hr, or a 6-v battery discharging at a rate of 32 amp, or a 200-watt lamp, or the total heat of 1/3 pint of fuel oil.

Recently I bought a small garden tractor. The fuel tank holds about 1 qt. In previous years I hoed the garden by hand and it took all the energy I had left each evening and week end to wage a losing hand-to-hand battle with the weeds.

That 1 qt of gasoline in the 150 lb of iron in the tractor is a better man than I ever hoped to be. I have doubled the size of the garden. I can now afford a bench at one end of the garden. And I have time to sit and enjoy the clean orderly rows. If doing nothing is a measuring stick, then I have improved my standard of living.

One gallon of fuel oil used in a diesel engine equals eight men working for 8 hr, or about 2c. per man per day for fuel. Liquid hydrocarbons are the most concentrated form of power now available. It is particularly fortunate for the transportation industry that two-thirds of the fuel, oxygen, already is distributed free in the air to every point on the earth.



In contrast, the fuel for man runs as high as \$1 per lb for solid fuel and \$6 per 4/5 qt for liquid fuel. As an engine, man weighs about 700 lb. per hp. It is easy to see that manpower is highly expensive.

Despite the high cost of manpower it does not follow that man is an unimportant part of the transportation machine. On the contrary, he is unquestionably a most perfect machine, as indicated by his general specifications.

1. Complete, self-contained, completely enclosed powerplant.
2. Available in a variety of sizes.
3. Reproducible in quantity.
4. Long life.
5. Life-time guarantee.
6. All major components in duplicate.
7. Weatherproof.
8. Amphibious.
9. Runs on a wide range of solid or liquid carbohydrate fuels.
10. Thermostatically-controlled temperature.
11. Circulating fluid heat.
12. Evaporative cooling.
13. Sealed lubricated bearings.
14. Audio and optical direction and range finder.
15. Sound and sight recording.
16. Audio and visual communication.
17. Equipped with brain controls.

It is this last item—brain control—that makes man a unique machine and is his most important function in power transportation.



Application of this brain power by engineers in the transportation industry makes it possible to co-ordinate movement of the fuel, powerplant, and vehicle together with the payload. When the vehicle can carry more payload than that required to cover total operating cost of the complete vehicle, the fleet operator realizes a profit. Common objective of the transportation business and its allied industries is more payload.

More on Waterspouts

(In the April issue of "The Roundel" we published an extract from "The Aeroplane" dealing with the waterspout hazard. The following letter to the editor of "The Aeroplane" carries this interesting subject a little further.—Editor.)

I WOULD LIKE to refer to "A.E.S.'s" article on "The Waterspout Hazard" in your issue of January 7, in which it is stated that waterspouts "are probably too small to give a radar echo."

In the latter half of 1942, whilst I was serving with 36 Squadron, R.A.F., on Leigh Light Wellingtons, one of our crews came in one night and related how they had picked up a radar contact and gone straight at it. The second pilot, who was up in the nose, suddenly shouted a warning, as he saw a mass of water suddenly loom up in the night, but he was too late, and the

good old Wimpey went straight through "the works." The crew got a good shaking up in several ways, as you may well imagine.

Presumably the "attack" was carried out at the usual height, 50 to 100 ft., which should have brought the aircraft into contact with "the solid wall of water at the bottom of the spout."

Official records might confirm this incident and give further information. If I am not mistaken, F/O Metcalf, a New Zealander, was at the controls; but my memory is a bit hazy.

C. F. PARKER.
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The ROYAL CANADIAN AIR CADETS



LEAGUE DIRECTORS CHART THE FUTURE

by ARTHUR MACDONALD, Director of Publicity,
Air Cadet League

ALWAYS ONE OF THE HIGHLIGHTS of the Air Cadet year, the annual meeting of League Directors from across the Dominion was this year more impressive than ever. Meeting at the Seigniori Club, P.Q., on March 9th and 10th, the assembled delegates elected new officers, heard reports on past activities and laid careful plans for the future of Canada's Junior Air Force.

The discussions this year were distinctly international in flavour. Air Cadet and Air Force officials of three countries were on hand to compare notes on Air Cadet training and to lay the groundwork for the future triangular exchange of Air Cadets between Canada, the United States, and the United Kingdom. Britain's Air Training Corps was represented by Major W. J. Taylor, O.B.E., D.L., and Wing Commander E. H. Umbers. The RCAF viewpoint was expressed by Air Commodore C. W. Busk, C.B., M.C., Air Commodore H. E. Nowell, C.B., O.B.E., and Wing Commander S. G. Birch, O.B.E. General Carl A. Spaatz headed the large U.S. delegation, which also included Colonel D. Harold Byrd, of Texas, and other members of the Civil Air Patrol.

League president D. Alex Ross set the tone of the meeting when he invited all present to participate in the discussions, stating: "We are a closely related group with a common purpose, all trying to do something for the American, British, and Canadian boy."

Mr. Ross was later elected President of the League for the second successive year. The four Vice-presidents for 1949 are: G. M. Eaton, H. E. Drope, M. Banker Bates, and C. K. Beveridge. These gentlemen, along with Honorary President C. Douglas Taylor, H. L. Garner and H. W. Aslin, make up the executive for the coming year.

Included among the RCAF representation were Air Vice-marshal E. E. Middleton, AOC Central Air Command, Air Vice-marshal K. M. Guthrie, retiring AOC of North West Air Command, and his successor, Air Vice-marshal H. L. Campbell. RCAF policy on such matters as training, radio outlets for Air Cadets, etc., was outlined by Air Vice-marshal C. R. Slemmon, Air Member for Operations and Training. As expected, Air Marshal Robert S. Leckie, retired Chief of Air Staff and special consultant to the League, played an important part in the discussions.

For the first time in history a number of outstanding Air Cadets were on hand to observe the



(Left to right) M. Banker Bates; Air Vice-marshal K. M. Guthrie; G. M. Eaton, League Vice-President.

manner in which League business is conducted. These were:—

FLIGHT CADET D. MCLEISH, Hamilton, *top Air Cadet on the 1948 flying training course.*

CADET A. PICKERING, Sarnia, *presently attending R.M.C. under Air Cadet League scholarship.*

CADET M. HOMONKO, Montreal, *also attending R.M.C. under Air Cadet League scholarship.*

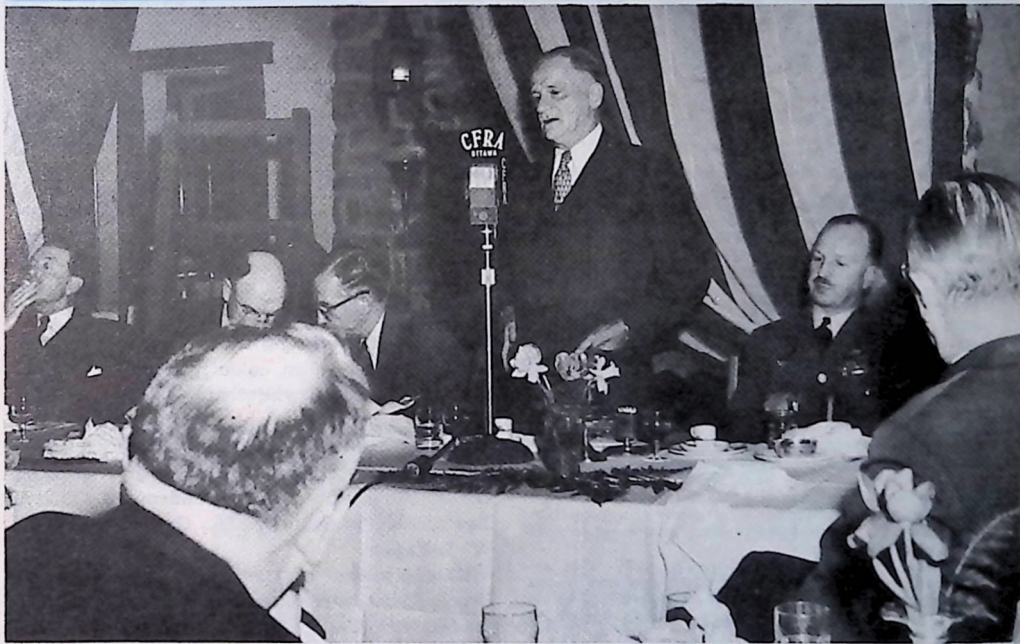
LAC JOHN LOWE, of 21 (Mount Royal) Squadron, *who last year received the first Air Cadet Award for Bravery after saving seven people from drowning.*

One of the more interesting phases of the meeting was a series of capsule reports delivered by Provincial Chairmen of the Air Cadet League.

These reports left no doubt that interest in the Air Cadets is definitely on the upsurge throughout Canada. In each Province there is a growing demand for new squadrons, and many units have been forced to set up waiting-lists in order to keep Air Cadet strength within the prescribed limits. An interesting point here is that several representatives from Newfoundland were on hand to observe the work of the League in preparation for launching the movement in Canada's tenth province.

After several prolonged and fruitful business sessions, the Chairman was able to announce the following developments, all designed to bolster and advance training of Air Cadets:

A campaign for public support will be launched during observance of National Air Cadet Week, April 6th to 13th.



General Carl A. Spaatz, retired Chief of the U. S. Air Force and Chairman of the U. S. Civil Air Patrol national executive board, addresses the gathering.



Hon. Brooke Claxton, Minister of National Defence, speaking at the Annual Dinner.

Canada will exchange 25 cadets with Great Britain and with the United States during the summer. The three-way programme will be thoroughly discussed at a conference in London, England, which will be attended by Honorary President C. Douglas Taylor and Managing Director George M. Ross.

The League will continue to award scholarships under which former Air Cadets may attend the Canadian Services Colleges. Over 25 new scholarships—valued at \$600 each—have already been raised by the League's provincial committees. Air Cadets successfully completing the Scholarship Flying Training will be awarded a set of wings by the RCAF. A newly-instituted Award for Bravery was also approved.

Air Cadet squadrons will participate in the Air Force Amateur Radio System. Stations will be set up by the squadrons, and one day each week may later be set aside for the transmission of Air Cadet messages.

The League will introduce a certificate of appreciation for personnel rendering outstanding voluntary services on squadron committees.

A special committee, headed by Dr. J. W. Tice, recommended the introduction of a medical and health programme for Air Cadets. Every attempt will be made during the coming year to bring the programme into effect.

In his concluding remarks, Mr. Ross asked everyone in the following year to keep the boy very much to the fore in his thinking. "We have

reached a high place in the Air Cadet League," he stated, "but will remain there only if we continue to work on . . . I want your best effort, gentlemen, for 1949 and I know I shall receive that best effort."

Held on the evening of March 9th, the Annual Dinner was the most colourful and impressive in League history. In the distinguished presence of His Excellency Viscount Alexander, Governor-General of Canada, the delegates and distinguished guests heard stirring speeches from President D. S. Ross, Honorary President C. Douglas Taylor, Air Marshal W. A. Curtis, and Major W. J. Taylor.

Chief speaker of the evening was the Hon. Brooke Claxton. He extended warm congratulations to the Air Cadet League, which, he said, is achieving "a greater measure of support both from the Service and from Canadian citizens than any other cadet movement I have ever seen."

The Defence Minister stated that the League provided an international link "of a type more valuable than anything written in treaties." Extending this thought into the realm of international diplomacy, he said that there were ties both of friendship and security which bind together the countries participating in the North Atlantic Security Pact.

"Let us make it clear," he said in closing, "that we are prepared to fight for our freedom. And let us make certain that we are going to have the means with which to do it."

A highlight of the dinner was Viscount Alexander's presentation of a painting on behalf of the League to R. Scott Misener, of Port Colborne, Ontario. The painting—a mountain scene by the famous Canadian landscape artist, Roland Gissing—was in appreciation of Captain Misener's outstanding services to the League and his contributions in entertaining the British A.T.C. cadets visiting Canada last summer.

After paying strong tribute to the League director, Viscount Alexander said: "No one can possibly disagree with me when I say that the work you are doing is of supreme importance not only to Canada but to the whole world."

General Spaatz was also called upon, and he spoke briefly as follows: "Cadet programmes such as those we are studying tonight are of the utmost



(Left to right) C. Douglas Taylor, League Honorary President; D. A. Ross, League President; His Excellency Viscount Alexander, Governor-general of Canada.

value to all of us. By this and other means our countries will be so strong in the air that we will not have to worry about fighting the next war."

Warm tribute was paid the RCAF by Lieut. General Bengt Nordenskiöld, Commander of the Royal Swedish Air Force. "The RCAF is our elder brother," he said. "The Canadian armed forces have always been in the forefront of battle. We have the greatest admiration for their contributions in two world wars."



U.S. AIR STRENGTH

(As of Jan. 1, 1949)

Navy

Combat types operational—USN	6,000
Combat types operational—USNR	2,183
Logistical support (USN, USNR)	3,314
(includes pipeline, overhaul and storage)	

TOTAL 11,497

USAF

Active combat types	5,500
Inactive combat types (storage)	5,000
Active utility types	7,500
Inactive utility types	6,000

TOTAL 24,000

("Aviation Week")

Slain... ONE DRAGON



(Wing Cdr. Shelfoon, formerly of the RCAF, has for some time past been Director of All-Weather Flying Training in the RAF. The present article, reprinted here in digest form, was originally published in the RAF periodical "Happy Landings." —Editor.)

by WING COMMANDER A. J. SHELFOON, A.F.C.

The Dragon

CONSIDERING THE SHORT TIME since man first became airborne, it is not surprising that the dragons of the air are in many cases still rampant—in fact it speaks well for the general efficiency of dragon-slaying methods that so many have been despatched in so short a time.

Overshadowing all else in the line of aviation dragons during recent years has been the "cumulonimbus cloud."

The magnificent thunderstorm project recently completed by the United States Air Force has proved beyond a shadow of doubt that thunderstorms are very much less a problem than rumour and idle gossip have led us to believe. At time of writing, more than 1,400 thunderstorms, chosen particularly for their size and vicious appearance, in both tropical and frontal conditions, have been flown through without casualty.

Fallacies Exposed

The project disproves pretty definitely that there are turbulence and gust velocities that will literally reduce an aeroplane to shreds. The project also disproves the theory that thunderstorms contain turbulence of sufficient violence to make an aircraft unmanageable.

Lest, however, anyone should underrate flight problems through thunderstorms, it is desired to make it perfectly clear that thunderstorm flying is not a matter to be considered lightly or tackled indifferently.

As it is impossible for Air Force pilots to make full contribution towards an all-weather Air Force and properly to carry out their duties without from time to time having to fly through thunderstorms, it is important that all should appreciate the correct technique for keeping the dragon dead.

Lightning

It is interesting to note that the factor which causes the greatest amount of worry and uneasiness on the ground—the possibility of being struck and killed by lightning—is the least worrisome factor in flight.

One airline in the United States has an average of one reportable lightning strike per week. In this country, B.E.A. is approximating to this figure. No aircraft of either of the two airlines mentioned has been seriously damaged by these strikes.

You may encounter two types of strike: one the usual type which is experienced on the ground and can be seen flashing from cloud to cloud, the other a discharge triggered off by your aircraft. Neither is likely to cause any serious damage, although both can be alarming—and the latter very startling, because it is not likely to be preceded by any warning and is not necessarily connected with a thunderstorm or even severe turbulence. The explosive type of discharge (i.e. it goes off with a bang) is not likely to be encountered at all if you are at temperatures above or well below freezing. It is more usual just below freezing. The best warning of this type of discharge is precipitation static, which is that type of static caused by particles of super-cooled moisture, ice, snow or

dust coming in contact with the aircraft. It is heard most usually on the V.H.F. receiver. The more usual form of lightning strike causes typical "crash" static, not heard on the V.H.F. receiver, but quite pronounced on the wireless-operator's receiver.

Turbulence

The major or greatest worry connected by the pilot with thunderstorms is that associated with violent turbulence resulting in destruction of the aircraft directly or indirectly following loss of control.

If turbulence as has been imagined did in fact exist, an all-weather Air Force would probably be impossible. But it has been confirmed by the thunderstorm project that the turbulence factor, while important, is very much less than even the most optimistic would have expected.

The result of the thunderstorm project indicates that the most severe jolts, or gusts as they are called, are not likely to exceed a velocity of 43 feet per second, and are much more likely to be about half this value. On not one of the flights was turbulence sufficient to topple the horizon or direction indicator, although in most cases these were the ordinary suction-driven types with normal limits. The severest gust factor encountered was of concern only in so far as some of the less well stressed transports were concerned: fighter aircraft such as the Thunderbolt and



Mustang could be flown at speeds greater than 400 m.p.h. without risk of structural damage. This also applies to American jet fighters, which indicates that fighter pilots need have no concern from a structural point of view.

If meteorological briefings and flight planning are properly carried out, all pilots should have a reasonably good idea as to when and where they are likely to encounter turbulence and with what severity. Forearmed with this knowledge, flight through turbulent areas, while admittedly not as pleasant as through clear air, should offer no cause for alarm.

Essential Precautions

Good instrument flying, of course, is essential, but then good instrument flying is expected of a competent Air Force pilot. There are some additional and very natural precautions which should be taken whenever turbulence is encountered, or when flight planning leads to its anticipation:

1. Be prepared (that is, mentally condition yourself) for a rough ride. Tighten your safety-belt, make sure all members of your crew are secure at their stations.
2. Slow down. The Americans have worked out very elaborate and interesting tables of best speeds at which to fly in turbulence. This is very commendable, but it is not considered that they are really necessary, because a summary of all the tables indicates that we must fly fast enough to avoid induced stalling, and slowly enough to avoid



damage by turbulence. This works out very readily and simply to a slow cruising speed roughly the same as would be flown for maximum range. There is no need to put the wheels down, and certainly flaps should not be lowered.

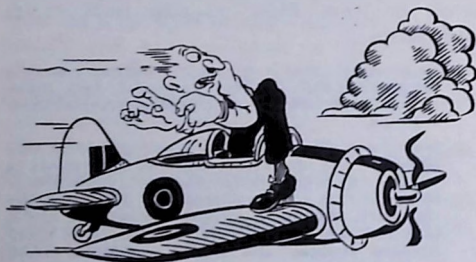
3. Pitot and carburettor heaters should, of course, be on.
4. Be sure the trailing aerial, if there is one, has been reeled in.
5. If at night, turn cockpit lighting up.

If you run through a thunderstorm you can expect the following:

1. Increase in turbulence. It may in fact get quite "rough."
2. It will get appreciably darker even by day. How dark it gets, of course, depends on the thickness of the cloud.
3. Expect very heavy rain sometimes mixed with light hail or even snow.

The above list of conditions to be expected sounds alarming, and in fact it is. But if expected, and you do not allow your alarm to interfere with your flying, you will find that you are through the thunderstorm in very short order—and with that feeling of satisfaction that can only come from mastery over your own fears. It has been done hundreds of times before, and you, too, can manage.

In the storm, devote your attention to flying the aeroplane. Concentrate on maintaining a level flight attitude. Don't worry too much about changes in height while in the storm; these are better ignored. Don't, in any circumstances, attempt to turn round if the going gets tough; once in the storm the quickest way out is the other side. Don't change direction unless absolutely necessary, and then make turns with very small angles of bank. Most important of all—don't panic.



Hail

There is another flight hazard—heavy hail. Experience to date would indicate that destructively heavy hail is only associated with isolated thunderstorms occurring in otherwise clear air over large continental areas. There is little evidence that very heavy hail is likely to be encountered in frontal thunderstorms or in most tropical regions. In any event, destructively heavy hail is extremely rare, and while quite a number of aircraft have suffered superficial damage from unanticipated hail, there is little evidence that aircraft have been lost through this cause.

To Sum Up

As a result of the information gained on the American thunderstorm project and from the not inconsiderable amount of thunderstorm flying which has been done by the Ministry of Supply and the Royal Air Force, we can look to the future of all-weather flying with confidence, as safe flights through these storms is very largely, as has been stated, a matter of training and confidence. It is important that all should have experience of this kind of weather whenever a reasonable opportunity presents itself. This does not mean that we should rush to fly into the largest and most

difficult storm in the area, but rather that we should flight plan with confidence through areas where a thunderstorm is known to exist and, having made a flight plan, stick to it. Evidence indicates that most accidents connected with thunderstorms are caused by panicky indecision, or frantic attempts to get out of an area of unpleasant turbulence while flying in cloud.

Large isolated thunderstorms which can be reasonably avoided without prejudice to the operational efficiency of the flight may be flown around, if only for comfort's sake; but where these clouds occur in large numbers or embedded in other clouds, a suitable altitude and track should be chosen and rigidly adhered to.

Fighter pilots in all theatres should take every opportunity of becoming familiar with instrument flight in turbulent conditions.

What is now required in the Air Force is an accumulated background of flight experience through these clouds and conditions, after adequate briefing and careful flight planning, not only by experts but by the rank and file pilots of all Commands, so that we may build up a wide background of knowledge and experience to enable us to operate where and when we will, with confidence and ability and a complete freedom from superstitious fear.

Thunderstorms have been proved flyable.



Jet Danger Zone

FOLLOWING THE DEATH of an engineer who was sucked into a jet air intake at Bitteswell recently, a Rugby jury recommended that a definite danger zone should be established for jet aircraft. There have been several examples of the disastrous result of unwariness in front of jet aeroplanes, all of which emphasises the need to explore this danger zone.

Most of our readers will recall the misfortune which befell Michael Daunt, the comfortably proportioned Gloster test pilot, in the early days of "jettety" in this country. While the Meteor prototype was being run up on the ground he incautiously approached too close and found himself wedged, head first, in one of the nacelles. Fortunately, no serious damage was done either to Michael or the Meteor.

Not so fortunate was Maurice Bricka, a U.S.A.F. mechanic, who was killed instantly when sucked

into the intake of a North American F-86 fighter at Muroc in September, 1947. A more recent and less disastrous example also comes from the U.S.A., where Edward Silva, a Douglas flight mechanic was sucked into the intake of the Douglas XESD1 experimental all-weather fighter again at Muroc. Silva, apparently, was saved, whereas Bricka was not, because he did not completely block the intake, he suffered only cuts and bruises.

Recently a U.S. Navy lieutenant volunteered to take part in tests designed to explore the extent of the danger area in front of a jet aeroplane. Securely roped back to guard against accidents, he was able to approach to within four or five feet of a North American FJ-1 Fury without losing his balance. It must be remembered, however, that the lieutenant was fully conscious of the danger and approached step by step.

(Courtesy of "The Aeroplane")

MEN, BIRDS



& PLANETS

PART ONE

(Reprinted by courtesy of "Interavia")

"There he goes, the mighty, massive bird!
How languidly he lifts and dips his wing . . ."

THESE ARE THE OPENING WORDS to a poem from the unpublished posthumous works of Otto Lilienthal, the aviation pioneer.

Today the study of bird flight forms part of the training of all aviation theorists. To the aviation enthusiast, the bird signifies as much as a sacred cow to a Hindu. Yet, we venture to assert that if there had been no birds, man would have conquered the air space with greater ease.

I can foresee your protests and am willing to concede that your argument is justified—to a point: without the example of the bird constantly in mind, man would have never learned to fly. Granted, man is an egocentric. When he refers to the conquest of the air space, he thinks of people such as Clément Ader, Henri Farman, Orville and Wilbur Wright, the Montgolfier brothers, and possibly the mystery-enshrouded Chinese aeronauts who, according to the chroniclers, were the first to take to the air as long ago as 1360 A.D. And man completely overlooks that the first timid attempts at flight were made on our globe quite some time before, namely, approximately three hundred million years ago, some time during

the carboniferous period. It was about that time that a kind of primitive insect, in some ways reminiscent of a dragonfly, suddenly acquired a pair of wings. The flying Saurians of the later Jurassic period emulated them about one hundred million years later, and after an interval of another fifty million years the first primitive bird—the Archaeopteryx—made its appearance. The above "dates" naturally must be assessed with caution. No records were ever "homologated" at the time. One thing seems certain, however: those early beasts (or birds?) did not take to flying with any more ease than we. The skeleton of a flying Saurian definitely indicates considerable difficulties during take-off and landing. The primitive bird which was found in the slate quarries of Solenhofen, Southern Bavaria, in 1861, is universally believed to have had a very limited radius of action. Just like those of a fledgeling, its motions are reported to have resembled a kind of frantic fluttering rather than actual flight. An outstanding expert on this Archaeopteryx, Professor M. Reichel testifies: "Its flight seems to have followed a wavy line and must have been interrupted by prolonged glides. But in no case could the Archaeopteryx have been called a high-performance soarer—for that purpose he would have had to be of entirely different design."

Be that as it may, both Bible and natural history agree that when man put in his appearance on the earth, he found it peopled by creatures that flew. According to Erhard at the "IX^e Congrès International de Zoologie" of Rennes, in 1914, seventy-five per cent. of all terrestrial animals and sixty-two per cent. of all beasts are capable of flight. Early man found he could make use of these flying creatures in a variety of ways—he could kill them, eat them, or tame them—and he also got the weirdest ideas about flying from them. History of aviation shows that he indulged in the last-named activity on a particularly large scale.

You can count the great pioneers of aeronautics who actually evolved reasonable theories about bird flight, on the fingers of your hands: Leonardo da Vinci, Marey, Langley, Mouillard and his disciples, the Swiss Huber, Sir George Cayley, Ader, the Wright brothers, Lilienthal . . . That is about the lot. This group of men was faced with a whole army of people whose views were based partly on complete ignorance of natural phenomena and partly on a naive and haphazard interpretation of what was going on around them.

The danger of reaching fallacious conclusions was obviously very great. It was possible to form erroneous ideas about the medium in which birds move, namely, the air. It was easy, furthermore, to make the biggest mistakes concerning the flying technique employed by birds. But even

those whose views on the properties of the air and the laws of bird flight were approximately correct, were liable to draw erroneous conclusions regarding the possibilities of human flight. Of interest are not only the usual initial errors of observation or deduction. Infinitely more astonishing are the perpetual relapses into errors that had been pointed out long ago. One might claim that in no other field of human endeavour have there been such marked periods of regression than in the interpretation of bird flight.

The Ancient Greeks, who lived along the path of the huge flocks of cranes migrating towards Asia Minor, had formed quite substantial notions about the technique of bird flight. Pliny recognized the functions of the bird's tail as an elevator. Herodotus knew that a bird must take off into the wind. Archytas of Tarentum (440-360 B. C.), a disciple of Pythagoras and a friend of Plato, constructed a small glider which, driven by compressed air, is reported to have actually flown (the world's first jet-propelled aircraft?).

Unfortunately, this vast store of knowledge was completely lost in the Middle Ages. At the time of Leonardo da Vinci the "Theory of Bird Flight" looked roughly as follows:

To fly is to swim. The wings function like fins, bird's tail, assisted by the feet, determines the direction of flight in the horizontal plane. Soaring birds maintain themselves in flight by "muscular and psychic effort." The Bird of Paradise, or





The primitive bird known as the *Archaeopteryx* was discovered at Solenhofen, Bavaria, in 1861. The piece of slate depicted is now in the possession of the British Museum.

paradisea apoda, is powered in flight by the fiery liquid it carries in its body. Where does he obtain this "fuel"? Explorers of the Middle Ages succeeded in discovering the secret somewhere in the Orient "beyond any vestige of doubt."

"The Bird of Paradise feeds on the rays of the sun and quenches his thirst with dew. He lives in the highest strata of the atmosphere. The female hatches her eggs on the downy back of her mate. These birds only come down to earth after their death."

An all-time record was shared by the sparrowhawk, however, since it was able to fly vertically up and down, and by a small bird called "starlet," or "*Stellino*," which was a lover of the planet Mercury and regularly flew to the Emyrean, the highest sphere of heaven and the abode of the gods.

When you read these "theories" of bird flight you really begin to appreciate the importance of the work carried out by Leonardo da Vinci.

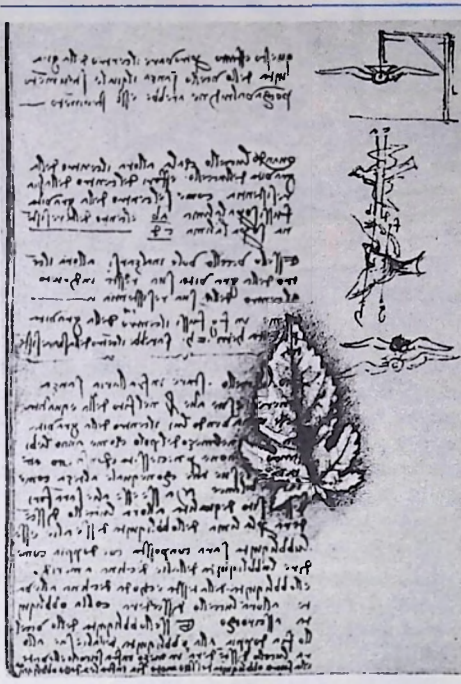
In all works of aviation history a place of honour is accorded to Leonardo, but the first really comprehensive and critical studies of his aeronautical manuscripts were made quite recently. They are contained in a two-volume work entitled "*Histoire des Idées Aéronautiques avant Montgolfier*," written by Jules Duhem, a French scientist, for the Centre National de la Recherche Scientifique (Paris, 1943-44).

Through observation, experimentation and calculation, Leonardo da Vinci gradually progressed to the point of realising the properties of the air. He learned that it was a medium which can be weighed, which furnishes resistance, is resilient and compressible; a medium which retains heat, rises and flows in an extremely complex pattern. Unknown to him remained the fact that atmospheric pressure drops with increasing heights, as a result of which he was unable to obtain an accurate notion of the nocturnal long-distance flights of migrant birds. On the other hand, he was quite familiar with the anatomical configuration of birds. He knew everything about the resemblance between bird and human skeletons—which allegedly was discovered by Pierre Belon in 1555—for he continuously refers to the shoulder, upper arm, forearm, elbow and hands of a bird.

The conception of his principal work on bird flight, "*Codice sul Volo degli Uccelli*," took place in a positively dramatic fashion. On March 14th,



Flapping flight. The bird beats its wings forwards and downwards.



A page from Leonardo da Vinci's "Codice sul Volo degli Uccelli," the Italian master's manuscript on bird flight. Leonardo used mirror writing, presumably in order to conceal his work from the clergy.

1506, he was strolling from Florence to Fiesole at the foot of the Appennines. Near Barbiga he spotted a bird of prey and immediately focussed his attention upon it. It was a milvus, or kite, which he had always considered to be a good omen, his private mascot. Suddenly he discovered that the bird glided and even soared by setting its wings at an angle into the wind. And like a flash he decided upon the plan for a book which was to clarify the problems of natural and mechanical flight. The second chapter was to have been entitled "Del Volo senza Batter Ali per Favor del Vento"—"On flight without wing-beat, with the aid of the wind."

This phrase in reality embraces the knowledge which humanity had to reconquer in a 400-year struggle after Leonardo's death.

It is regrettable that Leonardo da Vinci never got down to carrying out his plan. He merely completed a draft for his book, concluding his task on April 15th, 1506, after four weeks of intensive work. Together with other products of Leonardo da Vinci's labours, this manuscript was sent to Paris by Napoleon and was later stolen. In practice, the pioneers of powered flight were deprived of its wisdom until 1893. The modern glider pilot would read with admiration how Leonardo calculated the stabilising and control movements of a soaring bird. However, so far as muscular flight by man is concerned, even his genius went off the track. He argued along the following lines: A bat has a wing span of just over one foot. In proportion to its size, an eagle would therefore have to have a span of about one hundred and thirty feet. In reality, its wing spread is only seven feet. From this fact Leonardo deduced that the power of the beating wing increased as the cube of its area. He went on to quote an erroneous example by comparing the strength of a single reed with the combined strength of a bundle of nine reeds. Whilst he was not unaware of the tremendous muscular power of a bird's thorax, he explained that this strength is required for fleeing and the carriage of heavy prey. On these mistaken



Want to soar? This stilt plover shows you how.

findings he based the conclusion that the muscular strength of man should be sufficient for flight. As a cross-check he suggested the following experiment: A man should stand on soft ground and measure the depth of his footprints. He should then carry another man pick-a-back fashion and again measure his footprints. Finally, he should jump into the air as high as he can—of course without the other man on his back. On measuring for the third time he would find that, after the high jump, his footprints would be deeper even than those he made while carrying a heavy load. This was proof of the fact that man possessed more than twice the strength necessary to lift his own weight.

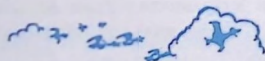
Fallacies—certainly. But they weigh nothing in comparison with the mountains of inadequacy and foolishness which succeeding generations piled up in the course of four centuries. A hundred years later the knowledge tediously acquired by Leonardo was lost. In 1599 an ornithologist named Aldrovandi again explained the phenomenon of gliding flight with "internal tension" and an "oscillation of the feathers which overcomes the force of gravity." In 1658 Gassendi asserted that hovering flight never existed and claimed that birds always beat their wings, even though these beats were sometimes so small as to be invisible. This error was reiterated as late as 1906 by another ornithologist, Exner. The latter would have found it easy to consult the "Codice sul Volo," since the French translation of it had been published in



1893. However, instead of troubling to wade through this work, Mr. Exner chose a simpler and, what he thought, surer way. He relied on his excellent sense of hearing and glibly wrote that birds beat their wings incessantly. He had personally heard the "whirring" of a bird of prey "hovering motionlessly" above his head (*Archiv für die gesamte Physiologie*, Vol. 114).

And in case you should imagine that "internal tensions" are a thing of the past, think again. In spite of Ader, Farman, Wright and the Douglas DC-3, in spite of Kronfeld and other great soaring pilots, the theory of "mystic" flight is still alive and kicking. The American ornithologist Aymar reports that as late as 1935 a well-known writer had expressed his conviction that bird flight was based on "levitation," the miracle which is claimed to have enabled the Saints to float in the air without visible means of support. According to the "expert" in question, a bird "varies the magnetic polarity of its body in such a way as to ensure that it is no longer attracted but repelled by the earth." The bird owes this ability to the fact that it "leads a pure life and devotes itself to intensive, ascetic concentration." Aymar dryly observes that it must have caused a headache to find a place for the vulture in this scheme of things.

(To be continued)



ROYAL CANADIAN AIR FORCE

Association



Double Charter Night in Guelph

MARCH 2ND was a notable date in the growing annals of the RCAF Association in the Royal City of Guelph. On that night the first Charter of the Association was presented to No. 400 Wing—hitherto known as the Guelph Wings Club. The other important event was the transferring of an Air Cadet Squadron Charter to a Wing of the Association. The occasion was marked by a joint banquet sponsored by No. 400 Wing and the Men's Club of Guelph "Y", held at the Royal Hotel.

More than 300 attended, including representatives from the various local service clubs and the two branches of the Canadian Legion. Among those at the head table were President Jack Spence, of Wing 400; President Bill Shaw, of the "Y" Men's Club; Air Chief Marshal L. S. Breadner, C.B., D.S.C., Dominion President of the RCAFA; Dr. W. W. McBain, Chairman of the Ontario Provincial Committee of the Air Cadet League; and representatives of the RCAF, the City of Guelph, and the local Air Cadet Committee.

Ken Jeans, the 2nd Vice-president of Wing 400, introduced the guest at the head table, with President Jack Spence of Wing 400 acting as chairman for the evening. Added entertainment was provided during the evening by the Royal City Four Barbershop Quartet, and the showing of a film entitled "Wasp Wings" which dealt with Spitfire Operations over Britain, Normandy, and Italy.

Air Vice-Marshal E. E. Middleton, Air Officer Commanding Central Air Command, introduced the guest speaker, Air Chief Marshal L. S. Breadner, part of whose speech is quoted below:

"I am going to tell you about the RCAF Association. It was formed away back in 1948, to be exact, on June 12th, Air Force Day. During the

period until we launched our general membership drive in February, we were fully employed in getting our organization set up to handle the enrolment of members and the formation of Wings. The response to the general membership drive has been wonderful, and back in Ottawa our staff have been working day and night in an effort to keep up with it.

"We have acted particularly on the thought that the RCAF is as deserving of a national hook-up as any other of the Services. A provisional directorate has been formed, but only to get the ball rolling. It will be pushed aside when the various Wings can democratically elect their own officers.

"When forming the RCAF Association, we were conscious that we might be considered as competing with the Canadian Legion, but their authorities have told us they are satisfied there is no conflict between the two Constitutions. In fact, many meetings throughout the country to organize Wings of the RCAF Association have been held in Legion Halls.

"The first and most cheering news we had was from the Guelph Wings, asking for a Charter in the Association.

"I would like to present to President Spence the first Charter that has been handed out by the RCAF Association. Mr. Spence, I congratulate you."

In accepting the Charter, President Spence pointed out that Wing 400 fully appreciated its new responsibility, and especially the fact that the Guelph Wing would be looked upon to some extent as a leader by other Wings now in the process of formation across Canada.

President Bill Shaw of the "Y" Men's Club gave a summary of the 121 (Guelph) Air Cadet Squadron since its inception by the Guelph "Y"

Men's Club in 1942. He surrendered the Air Cadet Charter to Dr. W. W. McBain, who in turn presented the Charter to Jim Marsland, the new Chairman of the Air Cadet League Committee of Wing 400.

During the course of his address, Dr. McBain gave a summary of Air Cadet Work in Canada. He mentioned the establishment of a permanent Cadet Camp at RCAF Station, Aylmer, Ontario. Also, he spoke of the goodwill which has developed between the Air Cadets of Canada, the U.S.A., and Great Britain, from the Air Cadet summer-exchange visits among the three countries.

One highlight of his speech was the disclosure of a blanket Cadet Insurance Scheme. From the

time the Cadet sets foot outside his own home on Air Cadet affairs until he gets back to his home, he is fully covered by insurance. Dr. McBain further outlined the training an Air Cadet receives, and the opportunities that exist for these young men to obtain flying training, and to qualify for scholarships to complete their higher education at R.M.C. in Kingston and at Royal Roads in B.C.

The evening was brought to a close by a general social hour, when those present had a chance to talk to the special guests and to renew Air Force acquaintances among guests from the various nearby cities.



Dr. W. W. McBain (right) presenting Charter to Mr. J. Marsland, the new Chairman of the Air Cadet League Committee of Wing 400. Seated at head table (left to right): Mr. B. Newstead; Rev. R. O'Brien, Padre of Wing 400; Mr. W. Shaw, President of Guelph "Y" Men's Club; Mr. T. MacDonald, Past President of Guelph Wings Club; Mr. D. Florence.



(Left to right) Dr. W. W. McBain, Chairman Ontario Provincial Command of Air Cadet League; Mr. D. Florence, 1st Vice-president Wing 400; RCAF Association; A C M L. S. Breadner, C.B., D.S.C.; Mr. J. Spence, President of Wing 400; A/V M E. E. Middleton, C.B.E., AOC Central Air Command, RCAF; Ald. H. Hosking, representing City Council of Guelph; Mr. K. Jeans, 2nd Vice-president of Wing 400; Ald. N. Burbidge, Chairman of Guelph Representatives of Wellington-Waterloo Airport Committee.

New Wings Being Formed

We take pleasure in announcing the formation, since the last issue of "The Roundel," of the following new Wings:

North Bay: under the Chairmanship of Mr. C. T. Alger, D.F.C.

Halifax all ranks Wing.

Air Force Veterans Association: Montreal.

RCAF Association Wing: Saint John, N.B.

The Saint John Wing is the first Wing to be formed in the Province of New Brunswick. Heartiest congratulations are extended to Mr. C. Y. Swanton, who took the initiative in that city.





WHAT'S THE SCORE

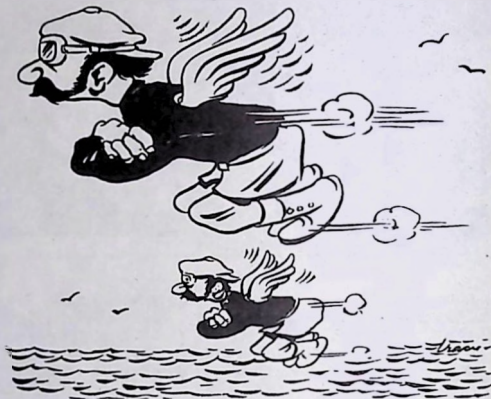
???

A score of under 16 is below average. Answers are given on page 48.

1. Name of a well-known novelist is:
 - (a) Churchman Winwood
 - (b) Winston Churchill
 - (c) Churchwood Hillston
 - (d) Winsome Churchstone
2. Canadian Minister of External Affairs is:
 - (a) Michael Pearson
 - (b) Humbert Pearson
 - (c) Monte Pearson
 - (d) Lester Pearson
3. Author of post-war best-seller, "The Naked and the Dead," is:
 - (a) Norman Thomas
 - (b) Norman Mailer
 - (c) Norman Bel Geddes
 - (d) Norman Conquest
4. President Truman has dubbed his economic programme for the U.S. as the:
 - (a) New Deal
 - (b) Square Deal
 - (c) Fair Deal
 - (d) Raw Deal
5. Permanent Chairman of Western Europe Defence Council is:
 - (a) Bernard Montgomery
 - (b) Robert Montgomery
 - (c) George Montgomery
 - (d) Montgomery Ward
6. Aid to Europe is commonly referred to as:
 - (a) DVA
 - (b) RIP
 - (c) ERP
 - (d) URP
7. Star Broadway acting team is:
 - (a) Gooderham and Worts
 - (b) Rodgers and Hart
 - (c) Cross and Blackwell
 - (d) Lunt and Fontanne

8. The first men to fly the Atlantic were:

- (a) Green and Longman
- (b) Bauer and Black
- (c) Black and White
- (d) Brown and Alcock



9. Only synthetic rubber producing plant in Canada is Government-operated:
 - (a) Palomar
 - (b) Polymer
 - (c) Pilobar
 - (d) Palomine
10. Leader of the Communists in Italy is:
 - (a) Togliatti
 - (b) DeGasperi
 - (c) Rigoletto
 - (d) Graziano
11. New U.S. Secretary of Defence is:
 - (a) Samuel Johnson
 - (b) Ezra Johnson
 - (c) Louis Johnson
 - (d) Jack Johnson

12. Author of best-seller, "The Big Fisherman," is:

- (a) William O. Douglas
- (b) Thomas C. Douglas
- (c) Lloyd C. Douglas
- (d) Douglas Abbott

13. Star of Broadway success, "Death of a Salesman," is:

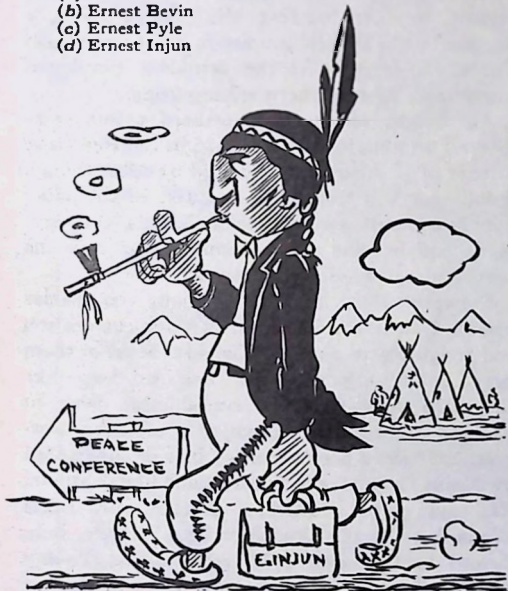
- (a) Lee J. Cobb
- (b) Irving S. Cobb
- (c) John S. Cobb
- (d) Tyrus R. Cobb

14. Political parties who nominated candidates for President of U.S. in last year's election numbered:

- (a) Two
- (b) Three
- (c) Four
- (d) Eleven

15. British Foreign Minister is:

- (a) Ernest Truex
- (b) Ernest Bevin
- (c) Ernest Pyle
- (d) Ernest Injun

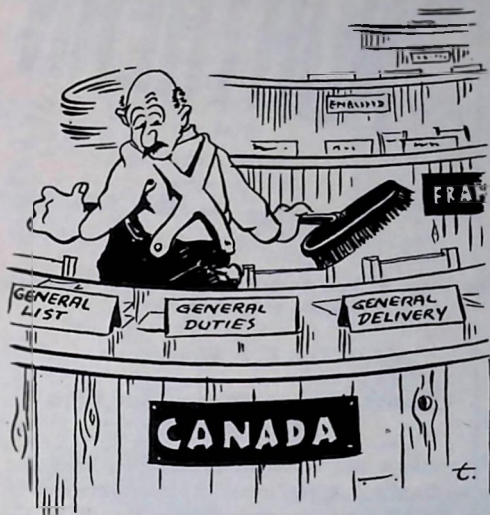


16. Chief of Staff, U.S. Air Force, is General:

- (a) Tannenberg
- (b) Brandenburg
- (c) Duesenberg
- (d) Vandenberg

17. Canadian representative on the Security Council is:

- (a) General Crerar
- (b) General Foulkes
- (c) General McNaughton
- (d) General Post



18. Soviet Foreign Minister is:

- (a) Andre Gromyko
- (b) Andre Baruch
- (c) Andre Vishinsky
- (d) Andre Hardy

19. Chief of the Imperial General Staff is:

- (a) F. M. Short
- (b) F. M. Wyde
- (c) F. M. Slim
- (d) F. M. Tabl

20. Commander-in-Chief of the Soviet Air Force is:

- (a) Marshal Vershinin
- (b) Marshal Rimsky-Korsakov
- (c) Marshal Vasilevsky
- (d) Marshal Plann

(The foregoing questionnaire is submitted by F/O W. M. Lee)





NORTHERN SKYTRAILS

PART VII

The Story of the Work of the RCAF in Canada's Arctic and Sub-arctic

by FLT. LT. E. P. WOOD, D.F.C.

COMMERCIAL AVIATION IN NORTHERN CANADA: 1920-1939

ALTHOUGH THE TITLE of this chapter may not immediately suggest much of direct interest to the RCAF, two important facts should be remembered. First, many of the RCAF's best-known northern pioneers either began or terminated their flying careers as civilian pilots; and second, the earlier activities of the RCAF were intimately bound up with many aspects of civilian flying. It is, in fact, almost impossible to give a fair picture of the RCAF in the north without devoting a little time to the work of the "bush pilots" and the airline operators who were so often its friends and collaborators.

General History

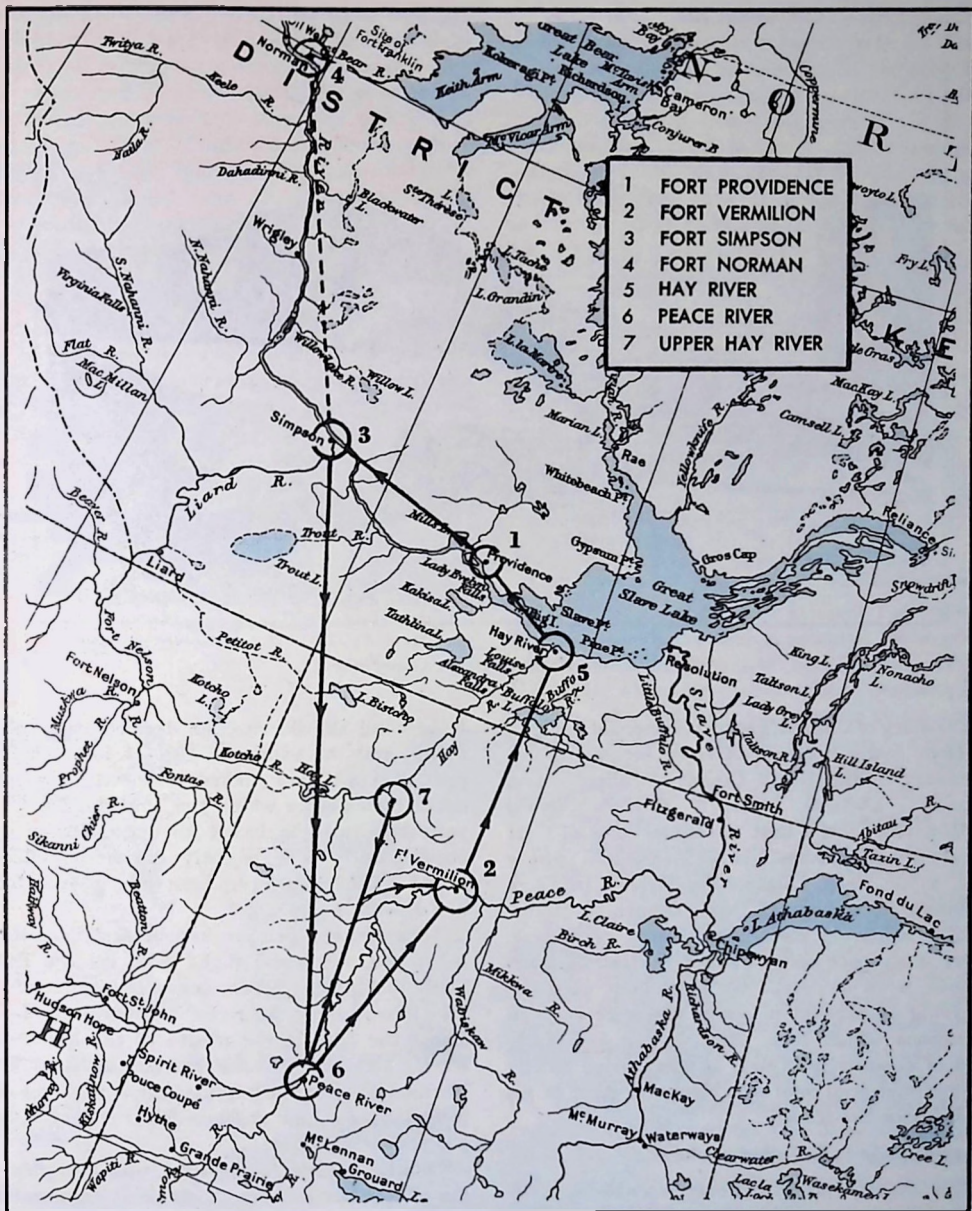
Flying freight services had their inception along Canada's northern air routes; and in 1937 Dominion planes carried the world's record tonnage of 24,000,000 lbs. In 1939 the air freighters of Canada moved 19,000,000 lbs., as compared with 9,500,000 carried in the United States during the same year.

In 1930 what is now the British Commonwealth's greatest source of radium and uranium, second

only in the world to the Belgian Congo deposit, was discovered in the far north of Great Bear Lake by plane. The aeroplane also played a prominent role in locating the richest mercury deposit in the British Empire in northern British Columbia. In 1931-32 the aeroplane developed many more new northern mining fields.

Air freight services to northern points commenced on a major scale in 1926 in the Red Lake district of Northern Ontario, and by 1933, though flying was still not fully accepted in the more populated southern districts of Canada, the aeroplane had become a commonplace factor in the northern regions of the Dominion.

Between 1920 and 1930 many companies operated airlines or used aircraft for exploration and freighting in northern Canada. Most of them were small organizations, one or two—like Canadian Airways—were considerable both in size and reputation. The majority of them, however, have since been absorbed into or superseded by Trans-Canada Air Lines (Canadian National Railways) and Canadian Pacific Air Lines (Canadian Pacific Railway Co.), which were formed in 1937 and 1939, respectively. To-day T.C.A., the only Canadian transcontinental air line permitted by law, has a record second to none throughout the world for efficiency and safety. Meanwhile, C.P.A. has been expanding rapidly and is now projecting regular scheduled flights across the Pacific to the Orient and the Antipodes.



- | | |
|---|-----------------|
| 1 | FORT PROVIDENCE |
| 2 | FORT VERMILION |
| 3 | FORT SIMPSON |
| 4 | FORT NORMAN |
| 5 | HAY RIVER |
| 6 | PEACE RIVER |
| 7 | UPPER HAY RIVER |



Junkers all-metal cabin monoplane.

The story of Canada's early commercial aviation contains many names that have become almost legendary in the North Country—"Wop" May, "Punch" Dickens, "Babe" Wollett, Grant McConachie, and a host of others. Some of their owners are dead; some, like C. H. Dickens (who is now, at 50, Sales Director for DeHavilland's of Canada), have crowned their astonishing careers with a relatively conventional type of success. There is no space here, however, to describe much of their work in detail. We must limit ourselves to giving an account of one of the more eventful operations which took place in the very early days of commercial flying. It was carried out by an ex-commercial pilot who has spent most of his adult life in the RCAF.

Group Captain E. G. Fullerton, A.F.C.

This officer, who retired only recently with the rank of Group Captain, was a pilot in World War

I. Leaving the Service, he decided to continue flying; and the winter of 1920-21 found him as pilot of one of two Junkers all-metal 6-passenger cabin monoplanes which the Imperial Oil Company had just purchased for operations in connection with their recently discovered oilfields near Fort Norman. From here the story continues in Fullerton's own words.

"The route which we had at first decided to follow for our initial flight was: via the Peace River to Fort Vermilion, across the source of the Hay River, along the river to Great Slave Lake, across the lake to the mouth of the Mackenzie River, and thence to Fort Simpson and Fort Norman. This route represented a total air distance from our base at Peace River of a little over 800 miles.

"Fairly reliable information was available to the effect that sufficient motorboat gasoline and oil would be obtainable at most of the trading

posts along our route. We had found by practical experiment that our engines would function satisfactorily on such gasoline after we had reamed out the carburettor jets to a slightly larger aperture. We therefore arranged to take with us an extra set of prepared jets. Doubt existed, however, as to whether sufficient fuel would be obtainable at Great Slave Lake. We therefore decided to establish a fuel cache on the Upper Hay River, at a point where a small trading post was located.

"The fuel-carrying flight to Upper Hay River was carried out by both aeroplanes on March 22nd, 1921. The landing was made on the ice of the river. When we were unloading the gasoline, a few Indians began to assemble a short distance away. It was the first time they had ever seen an aeroplane and they obviously regarded us as evil spirits descending from the sky. It was rather amusing later to watch them examining our ski-tracks where the skis had first made contact with the snow, then pointing skywards with frequent grunts and awe-stricken gestures.

"After some light refreshment with the Factor of the Trading Post, we returned to Peace River, 190 miles away. I might mention, by the way, that when we were inspecting the aeroplanes afterwards, we noticed two small holes in one of the fuselages, near the tail. They closely resembled bullet holes, and were situated directly opposite one another. The only conclusion we could come to was that some Indian on the Upper Hay River had fired a parting shot at the sky-demon.



"We were now ready to attempt the flight to Norman. Our party was augmented by a guest-passenger in the person of Sgt. Thorne, of the R.C.M.P., whom we were to take to Simpson. Sgt. Thorne, who had spent many years in the north, had only recently 'mushed' out from Simpson by dog-team, bringing with him an Eskimo prisoner. The personnel of our forthcoming flight to the north now consisted of Gorman (the other pilot), Waddell (the surveyor), crewmen Hill and Derbyshire, and Sgt. Thorne. Two days later, March 24th, at nine o'clock on a bright morning, 'Rene' and 'Vic' took off with ten days' rations from the aerodrome at Peace River.

"The weather held good for about the first hundred miles, then the clouds began to lower. Therefore instead of proceeding direct to our cache on the Upper Hay River, we turned east and landed at Fort Vermilion, where we put up at the Trading Post. Shortly afterwards the blizzard began, and continued for two days. At the Post we found that enough ordinary gasoline was available to fill our tanks to capacity, so we installed our larger jets.





On the shores of Great Slave Lake.

"On the afternoon of March 27th we took off from Fort Vermilion for Great Slave Lake. Two hours and forty minutes later we were landing in thirty inches of snow on the ice at the mouth of the Hay River on Great Slave Lake.

"Once more we refueled at the Hudson's Bay Trading Post, and the following morning we took off for Fort Providence—our policy being to refuel at every trading post along the route where fuel was obtainable.

"At Providence we were again fortunate in the matter of fuel, but on taking off we encountered a slight difficulty. The snow was so deep we could not get up enough speed to get the aeroplane into the air. After two unsuccessful attempts we decided on a plan: all five of us would walk abreast

in our snow shoes up and down the take-off stretch until we had packed the snow down to a surface that would give better support to the aeroplane skis. A number of local natives joined us in the task, and it was not long before we were ready to have another try. This time our efforts were successful and we headed for Simpson. Sgt. Thorne was chuckling to himself all the way in anticipation of his wife's surprise. Having no idea that he had got a lift by air, she would not be expecting him and his dog-team for at least another month.

"At Simpson we ran into real trouble. To land on the Mackenzie was out of the question, owing to the extremely rough state of the ice. However, a field on the edge of the settlement looked suitable

apart from a few snow-drifts, so a landing was attempted. The 'Vic' landed safely, but the 'Rene' was not so fortunate. One ski suddenly broke through the heavy crust of the snow-drift, causing the aeroplane to swing around into the drift, smashing a ski and breaking the propeller. Neither Gorman nor any of the occupants of the aeroplane was injured.

"We were told that about a mile south of the settlement, the ice of a small subsidiary channel (or 'snye') of the Mackenzie was free from hummocks and would probably afford us better landing facilities than the field we had used. Having confirmed the information on foot, we decided to fly the 'Vic' light out of the field to the snye, where it could be refuelled and prepared for the final hop to the Norman oil well—250 miles farther north.

"We thought it best that the 'Vic' should continue to Norman alone, leaving two of the party behind at Simpson with the 'Rene'. Having removed all possible load, and assisted by man-handling, I managed to taxi the 'Vic' to a far corner of the field and took off.

"On the flight from the field to the snye, the engine of the 'Vic' developed a pre-ignition knock—the result of using low-grade gasoline. The only remedy for this trouble was a top-overhaul, which meant further delay. As the engine of the 'Rene' had run much less time since its purchase than that of the 'Vic', and as the aircraft required only a propeller and a ski to make it ready for flight, it was decided to lend the 'Rene' the propeller and one ski from the 'Vic'.



"The change-over of propeller and ski to the 'Rene' was accordingly made and the latter was flown 'light' from the field to the snye where the 'Vic' was parked. She was then loaded, and flown off by Gorman, accompanied by surveyor Waddell and mechanic Hill. Misfortune, however, again dogged her. She had hardly reached an altitude of more than 50 feet when, for some reason, she stalled and crashed on the ice. None of the occupants was injured beyond a severe shaking-up, and the only damage to the aeroplane was a broken propeller, a slightly damaged wing, and a wrecked undercarriage. By an amazing bit of luck the ski borrowed from the 'Vic' was practically undamaged, which meant that the 'Vic' could at least have her ski back and would then be minus only a propeller.



"The lack of 'only a propeller' at first appeared to us, however, to be an insurmountable difficulty. It was suggested that perhaps it would be possible to make one, but this suggestion was immediately pooh-poohed as being quite ridiculous. None the less, calm reflection revealed that the only alternative was to wait until navigation commenced in July, then send to our base at Peace River for a new propeller—which would not arrive at Simpson until some time in August. The almost preposterous idea of making a propeller was again reviewed, this time in a more practical light.

"Enough of the broken propeller was available for the pieces to be fitted together to serve as a pattern from which templates could be made. The Catholic Mission had a few oak sleigh boards, 10 feet long and 7 inches wide, which was just about the size we needed to make a laminated propeller, except that they were an inch too narrow. We solved this difficulty by fanning the boards. We further learned that moose-hide glue was also



available, together with a number of large clamps. Father Docoux also informed me that we could have the use of the Mission work-shop. Finally, we were particularly fortunate in being able to secure the services of a Mr. Johnson, who was a skilled carpenter. Our mechanic, Bill Hill, was the leading light in the enterprise.

"Work began—slow, laborious, and infinitely careful. While it was going on, the 'Rene' was moved from the snye to a place of safety, and mechanic Derbyshire and I proceeded to give the engine of the 'Vic' a top-overhaul.

"It was now the 14th of April, and we were told that the ice usually went out of the Mackenzie during the last week of this month. Haste was, therefore, an essential, and we redoubled our efforts.

"Finally our day of days arrived, and the propeller was fitted to the engine. When we tested it for 'track', we found to our delight that it was out a little less than a quarter of an inch. We started the engine, warmed it up, and eventually opened the throttle full. The propeller behaved perfectly, both on the ground and during the test flight which lasted some twenty minutes. Hill and Johnson were acclaimed the heroes of the hour, and I still believe that the making of this propeller, in less than three weeks, is a feat which has never been duplicated before or since.

"It was now April 23rd, and to continue our flight to Fort Norman in the present circumstances, and with the break-up so close, would obviously have been the height of foolhardiness. Preparations therefore proceeded apace for a hasty departure to our home base at Peace River, and everything was in readiness by that evening for a take-off on the following morning.

"It was about five a.m. when we were aroused from our slumbers by an Eskimo who had come to tell us that the ice in the Mackenzie was beginning to break up. This disturbing news brought us all to our feet with a jump. In a few minutes we were snowshoeing our way to the 'Vic'—which, as previously stated, was parked on the snye about a mile from the village of Fort Simpson. We could distinctly hear the omnious rumbling and crashing of the breaking ice in the distance, and wondered whether we would arrive in time to rescue the 'Vic'. Fortunately there still remained some 400 yards of smooth solid ice ahead of the aeroplane from which a take-off could be effected. Beyond this stretch there was more or less open water except for innumerable floating ice-cakes. Not a moment was to be lost, and with feverish haste we prepared to start the engine.

"In the present urgent circumstances, it was most essential that the water and oil should be heated before being put into the engine, to insure a positive starting. One of us quickly applied a match to the fire which had been laid the night before, while others got the aeroplane all ready to fly. The fierce fire under and around the cans heated the water and oil comparatively quickly, but by the time we had poured them into the engine our take-off runway had been reduced to barely 200 yards. It was now about 6.30 a.m.

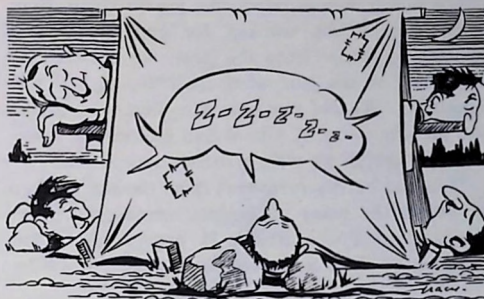
"While I was giving the engine a brief preliminary run, a trapper by the name of Jack Cameron, who lived at Fort Simpson, came along to watch the proceedings and to enquire whether he could be of any assistance. As he knew the surrounding country extremely well, I asked him to accompany me to the nearby lake on which I proposed to land, as he would prove a useful guide back to Fort Simpson. He needed no second invitation.

"I opened the throttle wide and we roared down the runway—which had by now dwindled to a bare 100 yards, beyond which was open water dotted with ice-cakes. We shot off the end of the ice over the water, and I eased the control column gently back. The aircraft threatened at first to settle down on to the water, and, in fact, the heels of the skis actually did make a gentle contact with the surface. But fortunately we eventually gathered sufficient speed and I was soon gaining height at a gratifying rate. That was about as close a call as one could expect to have and get away with. Jack Cameron thought it was great fun. The small nameless lake which was our destination could now be discerned on our left, and we headed straight for it. The 'Vic' settled gently on to the snow and came to rest.

"Our next step was the five-mile trek back to Fort Simpson to bring out the rest of the party and the equipment. Delayed by the deep snow and underbrush, we took about 3½ hours to get to Fort Simpson. Our trip included a rather thrilling crossing of the snye by leaping from one ice-cake to another, an exercise at which Jack Cameron was particularly adept.



"After a meal at Sgt. Thorne's, we hurried back to the 'Vic', carrying everything on our backs. The snye, which only a little earlier had been packed with ice, was now crossed by boat with the assistance of Jack Cameron. The last four miles were covered in not less than four hours. Twilight was falling when we at last reached the 'Vic', so we immediately made camp for the night, ate three partridges we had shot on the way from Simpson, and slept with untroubled minds.



"We took off at 8 a.m.—minus Derbyshire, whom we had left with the 'Rene'. Our fuel tanks were practically full, and we headed almost directly for Peace River. Apart from a threatened attack by a gigantic eagle, which made us sweat for the safety of our precious propeller, the trip itself was uneventful. However, as we went south, we noticed with consternation that the Spring had been there long before us. The snow became less and less, and as we got still nearer to our destination we saw that there was no longer any snow on the ground. We had planned to land on our aerodrome, but how were we to do that on skis? Even the lakes that we were now passing were open around the edges, and the remaining ice looked none too good. Eventually we decided that the best plan of action was to try a landing on Little Bear Lake, about 15 miles northwest of the town of Peace River. As we passed the lake on our way to drop a message on our own aerodrome, we noticed that the ice was blackish and that a number of ducks were swimming in open water all around its edges. This was not exactly reassuring, but we saw no alternative but to adhere to our plan.

"Arriving over the aerodrome (with an estimated 20 minutes' fuel left) we lost no time in throwing down the message to our cook-caretaker, who rushed out on to the aerodrome on hearing the noise of our approach. I then turned the 'Vic' towards Little Bear Lake. While dropping the message, we had been surprised to see a Junkers monoplane on the aerodrome, parked near the hangar; but we had no time to give it much thought just then.

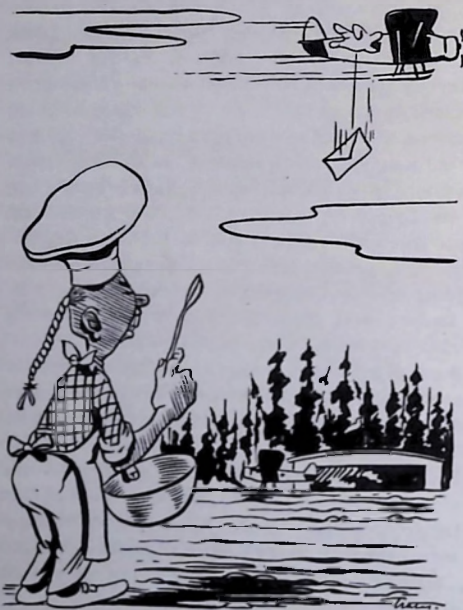
"To our immense relief, the ice on Little Bear Lake held. While waiting for our wheels and gasoline to arrive from the base, we drained the fuel tanks to see just what quantity of fuel was remaining. We did not expect to find very much, but the discovery of a bare half-gallon was something for which we were a little unprepared.

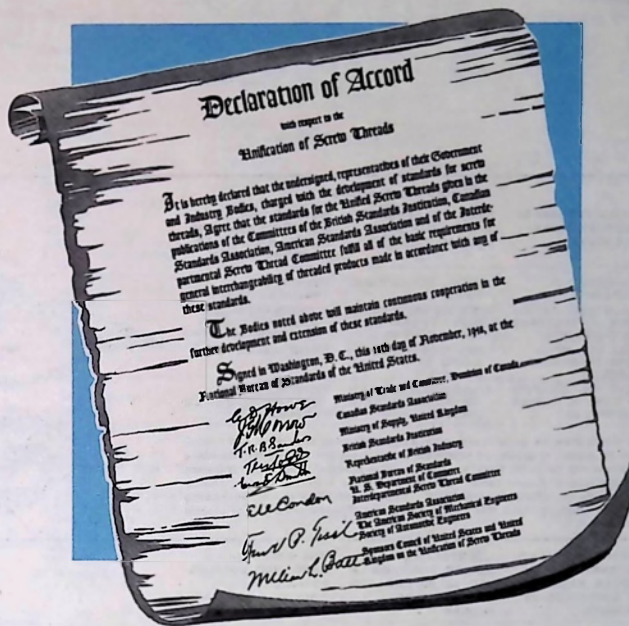
"We had hardly recovered from the shock when we heard the noise of a plane coming from the direction of Peace River. It proved to be the Junkers we had seen on the aerodrome. After



circling over our heads, it came down and landed (on wheels) a little way off from us. The door opened, and out stepped the portly figure of J. L. Larsen, the New York agent from whom Imperial Oil had purchased 'Vic' and 'Rene'. After a hearty exchange of greetings, Mr. Larsen informed us that he had flown up from New York a few days previously, partly with a view to seeing how we were getting along with our Junkers, and partly with an eye to further sales. On hearing that we were due back almost any day from our extended trip to the Mackenzie River, he had decided to wait in Peace River for our return. When we dropped the message, he was in the hangar talking to the caretaker. He had therefore brought with him the required wheels and gasoline. "Both aeroplanes then took off for Peace River, and about ten minutes later were gliding down to a landing on our home aerodrome."

(To be continued)





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A HISTORIC DOCUMENT

(Anyone who, like the Editor himself, has ever owned an English car must have encountered the difficulties arising from the difference between British and American screw threads. At last, however, as the following brief extract from the "SAE Journal" indicates, one of the fondest dreams of industrial and military organizations on both sides of the Atlantic has been realized.)

THE SIGNING of the above document formalized the agreement of Britain, Canada, and the United States to adopt the Unified Screw Threads.

The standardizing bodies of each country—the British Standards Institution, Canadian Standards Association, and American Standards Association as well as the Interdepartmental Screw Threads Committee in this country—will each publish its own standards. But all will be substantially uniform, based on the Unified Screw Thread System.

Although minor details still remain to be ironed

out, the accord which has been reached achieves interchangeability of threaded parts by attaining unity in the four elements of screw thread geometry and dimensional limits required for mating an external with an internal thread:—

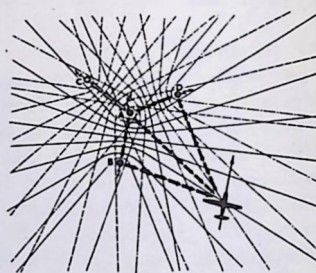
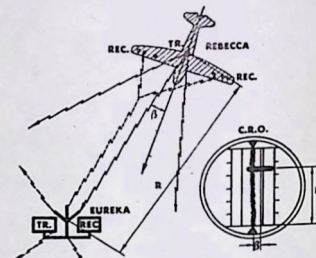
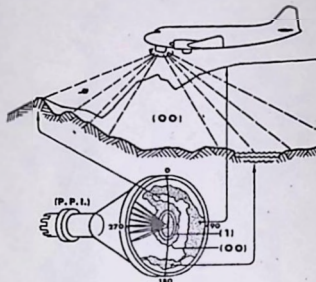
1. Thread angle
2. Thread form
3. Pitch (number of threads per inch)
4. Tolerances and allowances (which determine degree of fit).

AIR NAVIGATION RADIO AIDS

Part 3

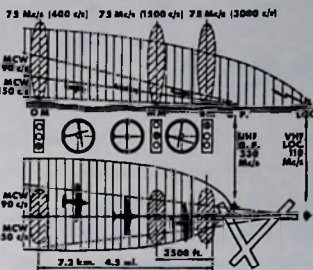


RADIOLOCATION (continued)			
11 POSITION-FINDING AND COLLISION-WARNING BY SHF AIRBORNE RADAR	RADAR D'AÉRONEF ET DÉTECTEUR D'OBSTACLE (SHF)	RADAR DE AERONAVE Y DETECTOR DE OBSTACULO (SHF)	ORTUNG UND HINDERISWARNUNG DURCH SHF RADAR-PANORAMAGERÄT
REVOLVING RADAR AERIAL CRO WITH REVOLVING TIME-INDICATING LINE (PPI) TRANSMITTED PULSE CIRCLE (BRIGHT ; 1) SAFETY CIRCLE OF CONE OF SILENCE (DARK ; 00)	ANTENNE RADAR TOURNANTE OSCILLOSCOPE CATHODIQUE A BALAYAGE TOURNANT (PPI) CERCLE DES IMPULSIONS TRANSMISES (CLAIR ; 1) CERCLE DE SÉCURITÉ DU CÔNE DE SILENCE (SOMBRE ; 00)	ANTENA RADAR GIRATORIA OSCILOSCOPIO CÁTODICO CON BARRIDO GIRATORIO (PPI) CÍRCULO DE LAS IMPULSIONES TRANSMITIDAS (CLARO ; 1) CÍRCULO DE SEGURIDAD DEL CONO DE SILENCIO (OBSCURO ; 00)	UMLAUFENDE RADARANTENNE KATHODENSTRAHLENRÖHRE MIT UMLAUFENDER ZEITLINIE (PPI) EIGENZACKENRING (HELL 1) SICHERHEITSKREIS DES SCHWEIGEKEGELS (DUNKEL ; 00)
<p>The terrain outside a cone of silence directly below the aircraft is scanned by a rapidly-revolving, very narrow, SHF (micro-wave) beam, and the reflections from the ground, or echoes, are reproduced on the scope of a cathode ray tube with a revolving time-indicating line synchronized with the aerial. Bright areas on the scope signify strong echoes; dark areas are "no-signal areas," indicating a body of water or shadows behind major terrain elevations. In this way a rough "shadow picture" is presented of the terrain below, hence facilitating position-finding. Elevations near flight altitude cause strong shadows to appear at the edge of the Plan Position Indicator, thus warning of obstacles. The system can also be adapted to detect storm clouds and other aircraft.</p>			
12 DISTANCE-MEASURING AND HOMING BY VHF "REBECCA-EUREKA"	"REBECCA-EUREKA" EQUIPEMENT VHF POUR LA MESURE DES DISTANCES ET LE HOMING	"REBECCA-EUREKA" EQUIPO VHF PARA LA MEDIDA DE LAS DISTANCIAS Y DEL HOMING	VHF DISTANZ-MESS- UND ZIELFLUG-VERFAHREN "REBECCA-EUREKA"
"EUREKA" (GROUND RESPONDER) "REBECCA" (AIRBORNE INTERROGATOR) CENTRAL TRANSMITTING AERIAL; DOUBLE RECEIVING AERIALS (AIRBORNE) "A" SCOPE PRESENTATION OF CRO	"EUREKA" (RÉPONDÉUR AU SOL) "REBECCA" (INTERROGATEUR D'AÉRONEF) ANTENNE CENTRALE D'ÉMISSION; ANTENNES DOUBLES DE RÉCEPTION (D'AÉRONEF) "A" SCOPE CRO	"EUREKA" (RESPONDÉOR EN EL SUELO) "REBECCA" (INTERROGADOR DE AERONAVE) ANTENA CENTRAL DE EMISIÓN; ANTENAS DOBLES DE RECEPCIÓN (DE AERONAVE) "A" SCOPE CRO	"EUREKA" (WIEDERDÖRNER AM BODEN) "REBECCA" (BORDAUSRÜSTUNG) ZENTRALE SENDEANTENNE; DOPPELTE EMPFANGSANTENNEN (AN BORD) SICHTGERÄT MIT ZWEISEITIGEM ECHOZACKEN
<p>Short-range aid to navigation of airways, used primarily for homing. An airborne radar station ("Rebecca") emits through its central transmitting aerial system VHF pulses which are repeated on a different frequency by a non-directional ground responder ("Eureka") located in aerodrome vicinity, received on board the aircraft by two azimuth D/F aeriels, and displayed on the "A" scope of a CRO with indications of distance (R) and approximate relative bearing (β). Range is 50-100 miles, according to altitude and output of "Eureka" beacon.</p>			
13 DIFFERENTIAL-DISTANCE MEASURING (HYPERBOLIC NAVIGATION)	MESURE DIFFÉRENTIELLE DES DISTANCES (SYSTÈMES HYPERBOLIQUES)	MEDIDA DIFERENCIAL DE DISTANCIAS (SISTEMAS HIPERBÓLICOS)	DIFFERENZ-DISTANZMESSSYSTEME (HYPERBEL-VERFAHREN)
"GEE" UHF SHORT-DISTANCE NAVIGATIONAL AID "LORAN" MF (LONG-RANGE AID TO NAVIGATION) MASTER STATION (A) SLAVE STATIONS (B, C, D)	"GEE" (UHF) POUR LA NAVIGATION A COURTES DISTANCES "LORAN" (MF) POUR LA NAVIGATION A LONGUES DISTANCES STATION MAÎTRESSE (A) STATIONS ESCLAVES (B, C, D)	"GEE" (UHF) PARA NAVEGACIÓN A CORTAS DISTANCIAS "LORAN" (MF) PARA NAVEGACIÓN A LARGAS DISTANCIAS ESTACIÓN MAESTRA (A) ESTACIONES ESCLAVAS (B, C, D)	"GEE" (UHF) FÜR KURZSTRECKEN-NAVIGATION "LORAN" (MF) FÜR LANGSTRECKEN-NAVIGATION HAUPTSENDER (A) NEBENSENDER (B, C, D)
<p>In "GEE" and "LORAN," the difference in travel-time of pulses emitted from three widely-separated ground stations (master station - 2 slave stations) are measured in an airborne receiver, each difference defining a hyperbola (locus of all points having a constant difference of distance from two fixed points). The position of the aircraft is at the intersection of two hyperbolae. Cathode-ray tubes are used for measuring the travel-time differences, the result being a four-digit hyperbola number. Positions are thus found by means of lattice charts superimposed on maps. LF/"DECCA" and LF/MF - "POPI" (Post Office Position Indicator), which are under test, are likewise hyperbolic navigational systems, but use phase comparison instead of radar.</p>			



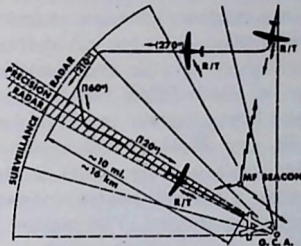
ALL-WEATHER LANDING			
14 VHF/UHF INSTRUMENT LANDING SYSTEM (ILS) ON TWO BEAMS	ILS (SYSTEME D'ATERRISSAGE SUR DEUX FAISCEAUX VHF/UHF)	ILS (SISTEMA DE ATERRIZAJE SOBRE DOS HACES VHF/UHF)	VHF/UHF BLIND-LANDEVERFAHREN "ILS" AUF ZWEI LEITEBEINEN
VHF LOCALISER	RADIOPHARE DIRECTIONNEL VHF	RADIOFARO DIRECTIONAL VHF (LOCALIZADOR)	VHF ANFLUGBAKE
UHF GLIDE-PATH TRANSMITTER	RADIOPHARE DE TRAJECTOIRE DE DESCENTE UHF	RADIOFARO DE TRAYECTORIA DE DESCENSO UHF	UHF GLEITBAHNBAKE
THREE VHF MARKER BEACONS (cf. 2)	TROIS RADIOBALISES VHF (cf. 2)	TRES RADIOBALIZAS VHF (cf. 2)	DREI VHF SIGNALBAKEN (cf. 2)
CROSS-POINTER INSTRUMENT AND SIGNAL LIGHTS	INSTRUMENT A AIGUILLES EN CROIX ET SIGNAUX LUMINEUX	INSTRUMENTO CON AGUJAS EN CRUZ Y SEÑALES LUMINOSAS	KREUZZEIGER-INSTRUMENT UND MERKLEUCHTEN

The American ILS (also SCS-51 or CAA System), recommended by ICAO for international adoption, uses two guiding planes to define an approach path, which originate from a VHF localiser situated at the upwind end of the runway centreline, and a UHF glide-path transmitter positioned away from the runway and on a level with the proposed touch-down point. Two pairs of MCW beam arrays, with 80 c/s modulation on one side and 150 c/s on the other, each intersect to define a plane. A cross-pointer instrument indicates the position of the two planes relative to the aircraft; three VHF marker beacons (outer, middle and boundary markers) register visual or aural signals when the aircraft flies over them, thus indicating the distance away from the runway.



15 UHF/SHF (RADAR) GROUND CONTROLLED APPROACH (GCA)	GCA (UHF/SHF) APPROCHES SANS VISIBILITÉ	GCA (UHF/SHF) ACCESO SIN VISIBILIDAD)	UHF/SHF RADAR-BLINDLANDEVERFAHREN "GCA"
UHF SURVEILLANCE RADAR (30-MILE RANGE)	RADAR DE SURVEILLANCE UHF (PORTÉE 50 KM)	RADAR DE VIGILANCIA UHF (ALCANCE 50 KM)	UHF RADARSUCHGERÄT (50 KM. UMGREIS)
SHF PRECISION RADAR FOR ELEVATION BEAM	RADAR DE PRÉCISION SHF POUR LE SONDAGE EN SITE	RADAR DE PRECISSION SHF PARA EL SONDAJE EN PUESTO	SHF PRÄZISIONSRADARGERÄT FÜR HÖHENMESSSTRAHL
SHF PRECISION RADAR FOR AZIMUTH BEAM	RADAR DE PRÉCISION SHF POUR SONDAGE EN AZIMUT	RADAR DE PRECISSION SHF PARA SONDEO EN AZIMUT	SHF PRÄZISIONSRADARGERÄT FÜR SEITENMESSSTRAHL
"TALK-DOWN" (INSTRUCTIONS BY RT)	(CONSIGNES EN PHONIE)	(CONSIGNAS POR FONIA)	"HERUNTERSPRECHEN" (DURCH SPRECHLINKANWEISUNGEN)

Aircraft within the 30-mile-range of GCA's rotating UHF surveillance radar aerial are registered on a PPI scope. Aircraft desiring to land receive RTT instructions guiding them into the zone of the two SHF precision radar beams which scan the approach sector in elevation and azimuth, and display the aircraft's progress on two scopes; off-course deviations are communicated by RTT to the pilot. Airborne equipment, in addition to blind-flying instruments, can be confined to a VHF two-way radio to make the "talk-down" procedure possible.

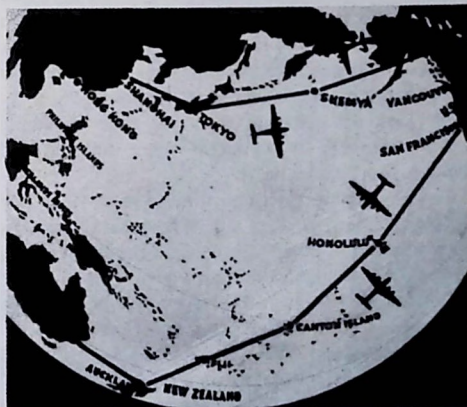


(Courtesy of "Interavia")

CPA PUSHES WESTWARD

By SUMMER, Canadian Pacific Air Lines wants to have two Pacific routes in operation, one extending 6555 miles from Vancouver to Tokyo, Shanghai and Hong Kong, via the Aleutian Islands, and the second running 8899 miles from Vancouver to Sydney, Australia, and Auckland, New Zealand, via San Francisco, Honolulu, Canton Island and Fiji. Four pressurized Canadair Fours will be used for these operations.

("Aviation Week")



SLOW DOWN, CHUM!



by CAPT. PAUL W. ECKLEY

(Reprinted by courtesy of "Flying Safety")

WHY DO PILOTS always seem to be in such a hurry? What's the reason for all the rush?

Sometimes you'd believe that all the pilots in the Air Force are from a great metropolis where everybody is always in a rush trying to catch subways, buses or trains, or just plain in a hurry. These residents always seem pressed for time. They look neither right nor left as they elbow their way through the crowds, giving no thought to the comfort of their fellow human beings. Many pilots have been observed to act in the same manner.

Stewart Field recently reported a T-6 accident that was caused by a pilot in a hurry. In this case a tight overhead pattern and peeloff was flown in preparing to land. The pattern was so small and took such a short time that when the pilot broke his glide over the runway, the airplane promptly settled on its belly. The flares, red lights, and radioed warnings from the tower could not stop this pilot as he serenely waited for the wheels to kiss the pavement. The chopping of the propeller on the concrete is a far different sound than the kiss of rubber on the runway. It was then that he realized with great embarrassment that the gear was still retracted. The walk to the ramp from the crash took a lot longer than the time he would have consumed by flying a larger pattern and making proper checks.

Take a trip to operations one of these days and see pilots lined up at the weather and operations desks champing at the bit to get in the air. Nothing makes fly-boys more addled than to wait in line in the weather office for the forecaster to finish a clearance to some far-off place, and then have another pilot shove his clearance under the forecaster's nose. (Especially if that fly-boy happens to outrank you.) Sometimes you can actually see the



pilots chewing their fingernails in their impatience for the dispatcher or airdrome officer to sign the clearance. Then out the door they zip in their mad rush to man their planes. It really is a "scramble."

Out on the line the same procedure continues. They kick the nosewheel tire and ask, "Where the hell is the fire guard?" Then without slowing up a bit they vault into the cockpit, holler "clear," and taxi off in a cloud of dust.

Take a seat on the ramp one of these days and watch some of our hot-rod pilots taxi by. Some of them roll by with a look of utter boredom on their pusses. Their arms are out the windows and they are evidently dreaming of something far off at the end of Green 5. Others come by with a Spencer Tracy scarf flying, but with that same gleam in their eye. Jets squirt past with the round dome of a crash helmet filling the canopy and a pair of eyes peeping out from under the brim and barely over the edge of the cockpit. But best of all are those that zoom by riding the brakes with abandon and with their faces and bodies inclined forward trying to get a few extra miles-per-hour ground time saved. They disappear around a bend in a cloud of dust and shortly thereafter appear in the air with the gear retracted starting out on course in a mad climb out of the traffic pattern.



The Roundel

What's the rush? Where are they going that this speed is so necessary? More often than not, if you check, you will find that the purpose of the flight is "flying proficiency." Even when they are just getting flying time they will plan a direct clearance flight over an area with no check points instead of going airways because they save a few minutes' flying time by going direct. When they reach their destination on a cross-country flight and a straight-in approach is denied, you can hear the squawk all the way to Elmendorf. If their touchdown is going to be past the first third of the runway... so what the hell... drop it in on the second third. (It will probably take all of five minutes to make a go-around and another landing.) If a short cut to the ramp via the first taxistrip can be made, with a screeching of tires and brakes and a hurried unlocking of the tailwheel they take it, even though they may blow a tire or groundloop in the process.

What's in a pilot's make-up that requires him to complete his flight in such a hurry? Why the mad rush? He can't wait until he gets in the air and then he can't wait until he gets back on the ground. Certainly that is no way to live a long and fruitful life.

Numerous barriers are placed in his path to slow him down. Stacks of regulations are published to stop him, but still pilots fly almost as fast on the ground as they do in the air. The Form 23 stops him right off the bat. Time must be consumed in



completing this form and signing four or five times in different places. Then the whole thing must later be checked over by the airdrome officer or the clearing authority. Then further, if it's an IFR clearance he will have to wait for ATC clearance before he can get up in the soup. Hurry up and wait! That, however, may be the reason they rush so.

Maybe that is the answer. All these things must be completed and still the pilot feels that he must get to where he is going before half the day is gone.

In any event we should all give a thought to the manner in which we rush through getting a clearance, taxiing out and getting in the blue. Rushing has cost many a pilot his life. Flying is not a vocation that is suitable to speed other than in the air. Take time, be meticulous, perfect, and exact and you will live a long time. The more that you rush, the quicker you approach your life expectancy. Slow down, chum... slow down.

**OH THEY AINT IN NO
REAL HURRY —
THEY'RE JUST
PILOTS!**



U.S. SERVICE PLANE DESIGNATIONS

(Courtesy of "Aviation Week")

THE RAPIDLY-CHANGING missions and technology of the Air Force and Naval Aviation require accompanying changes in aircraft designations although the principle of both systems is the same.

Following systems are in present use:

Air Force

Air Force designates the mission, type and model number of its aircraft by the following letters:

B—bombardment	L—liaison
C—cargo	R—reconnaissance
F—fighter	S—search
H—helicopter	T—trainer
X—amphibian	

In addition, A., amphibian, is used as a prefix to other mission designations but not alone. These letters are also used in combination to indicate dual missions, such as:

TF—trainer-fighter
SA—search-amphibian
RB—reconnaissance-bombardment
LC—liaison-cargo

Prototypes are designated by an X prefix and production models by alphabetical suffixes, such as F-80A, F-80B, F-80C, etc. Suffix letters normally indicate a lack of complete interchangeability of parts, usually the engine, or changes which affect the performance, maintenance or tactical use of the airplane.

Navy

The Navy designation system is similar except that a manufacturer's identifying letter is added as well as detailed suffixes indicating special missions. Navy aircraft type designations are:

VA—attack	VF—fighter
VH—helicopter	VP—search
VT—trainer	VR—transport

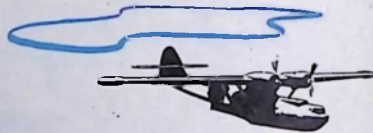
Currently active aircraft manufacturers are identified as follows:

B—Beech	C—Curtiss
Boeing	D—Douglas
E—Piper	F—Grumman
G—Goodyear	H—McDonnell
J—North American	M—Martin
O—Lockheed	Q—Fairchild
R—Ryan	S—Sikorsky
U—Chance Vought	Y—Convair

In addition, a large number of suffixes are used to indicate special modifications to otherwise standard aircraft types:

A—amphibian
B—special armament
C—carrier version of non-carrier aircraft
D—drone control
E—special electronic gear
G—search and rescue
H—hospital
J—target tow
K—target drone
L—searchlight
M—weather reconnaissance
N—night operating aircraft
P—photographic
Q—countermeasures equipment
R—transport
S—anti-submarine warfare equipment
T—training
U—utility
W—special search
Z—administrative

Navy combines these numerals and letters to indicate separate types and models by designating the first numeral as the model designation and the second numeral as changes in the same model.



REFUGE



(Last month Group Captain Cameron described his experiences while house-hunting in Prague. This month another member of our homeless Service tells of similar troubles in Canada. Not wishing to be barred from his Mess, he prefers to remain anonymous.—Editor)

I AM A MODEST MAN.

Therefore it is no spirit of self-aggrandizement that urges me to sing this little saga of achievement. It is altruism. Sitting here in this luxurious flat, enjoying a final pipe in the midnight silence, I feel it my solemn duty to describe how one Service family escaped from beneath the bitter yoke of the landlord.

We live—Jennifer, Jennifer's mother, and I—over a store in the market. The flat we occupy was not always a flat. Once it was a warehouse. However, the bearded trafficker in used garments who owns the store below suddenly came to the conclusion that it might just as well house humans as stale clothing. Furthermore, humans pay rent.

To us, battle-scarred by a year's hostilities with women whom the mere mention of children threw into an almost infanticidal frenzy, it seemed incredible that we had actually been deemed worthy of normal shelter. The shock was too great. We rushed up the dingy staircase to our new home, locked the door behind us, and sat sobbing hysterically on the unscrubbed floor.

When we had somewhat recovered ourselves, we made a careful survey of our domain.

Bath, frigidaire, electric stove and heater, wash-basin and "usual offices": these things our benefactor had provided. All else was squalor. The walls, which had probably been whitewashed at about the time of my own birth, were stained with chemicals. Inch-wide gaps lent emphasis to their corners. The floors were guiltless of paint or varnish. Cockroaches sauntered across them with a languid air, and it was apparent that a few of

the neighborhood cats had used the place as a council chamber. The windows of the front room were blacked out with a compound that defied the fingernail. Boneyard odours rose from the kitchen sink.

Such was our land of promise.

(Here, Cheerless Reader, crouching in your dreary room, ever awaiting that peremptory knock which prefaces an announcement that you are using too much hot water, that it was never realized that your child would be home during the holidays, that you are, briefly, a no-good upstart transient—here I must pause to look around me, and breathe a deep breath of satisfaction. Soft-tinted walls glow back at me, polished floors invite my feet when I have finished my pipe and decide to go to bed. In her little room next door Jennifer lies sleeping like the carefree child she is, untroubled by dreams of Dragons creeping upstairs to tear her limb from limb because she did her doll's laundry in the bathroom that six people share. Here is beauty hewn from chaos. Here is rest and quiet.)



For a week we scoured. Then for two months we decorated. Chocolate ceilings, "dropped" artistically a foot from the top of cream walls, lowered the rooms' excessive loftiness. Doors, twice coated, smooth as porcelain, swing on oiled hinges. Floors were scraped, stained, and varnished. We plugged all chinks with putty. We wired the flat for innumerable lamps, and installed a phone. I hung on a rope above the street and wore down a dozen razor blades, once more letting light into the front room.

Saws buzzed and hammers rang. Shelves and cupboards came into being. Partitions arose. Plate racks and towel-rails were micrometrically fitted. And in the end we had a modern apartment, all the more impressive by reason of its rather unappetizing approach. "Reminds me of Paris—comfort behind shabbiness," said a travelled friend. That remark kept us beaming for days.

But we were not permitted to relax as yet.

When the smell of disinfectant and turpentine had abated, and the air was once more sweet to insect nostrils, we were unexpectedly plunged into the second phase of the struggle to establish ourselves. Invaders arrived, homesick and desperate, eager to repossess their ancestral stamping-grounds. . .

For two more months we stood back to back, spray-guns in hand, holding them off. Every minutest crack in the wainscotting was filled up. Fumigators were called in, but they accomplished little beyond the poisoning of all Jennifer's tropical fish. We bought a book on household pests, and doggedly fought on.

Ultimately, superior discipline and science prevailed. By good fortune the enemy's ranks did not include the more revolting types of insect. Beetles, cockroaches, queer flies, daddy-long-legs, spiders: those formed the main body of their forces. The dreaded scourge was not among them. The "flat, ill-smelling, blood-sucking insect" (I quote our pest-book)—It, thank Heaven, was absent. The indestructible, the all-evacuating, the unthinkable—the **BED-BUG**.

I will not pretend that we have utterly annihilated the foe. In conflicts of this nature, I am assured that a complete and lasting triumph is

virtually an impossibility. From his retreat behind the walls the enemy still makes occasional sorties. Only last night I encountered a huge and hardy character who had obviously been sent out to reconnoitre on the bathroom floor. We fought, and I slew him—but not before he had taken three point-blank salvoes full in the face. A post-mortem revealed him as a centipede, very heavily armoured. I was not perturbed. Such isolated skirmishes add zest to life, keep the faculties alive. Successes that are too easily won and too easily maintained are never fully appreciated. . . .

So there you have it. My tale is told. We who were once even as you, Poor Badgered Roomer—by perseverance and indomitable courage we have made a refuge for ourselves in the home-lover's wilderness that is our Canada. Go, like us—seek for warehouses, garages, stables. Escape while yet there is time, or the Dragon will surely destroy you. Find yourself a sewer. Find anything. Get in there fighting—and some day you too may once again know peace, and security, and lordship of all you survey.

It has taken us about five months to do what we have done. With any luck, we have a year left, before I am posted, in which to enjoy the fruits of our labour. But it was worth it. How else could I be sitting here in my own home, at ease in my slippers, fearing no woman, and burning all the light I wish?

Before bidding you good-night, though, let me give you a tip. When you find your sewer—that is, your warehouse—use a good casein paint. The ordinary kind tends to flake off after a while. Little pieces keep falling . . . like the one that just dropped on to my paper . . . nothing to worry about, but—

What the . . . it's crawling!

"Flat . . ."

No!

Not that! **NOT THAT!**



the empire test pilots' school

(Reprinted by courtesy of "Air Clues")

THE TERMS OF REFERENCE of the Empire Test Pilots' School at Farnborough might be summed up as:

"To provide suitably trained pilots for test flying duties in aeronautical research and development establishments within the Services and industry."

The syllabus is designed to provide a course lasting some 10 to 11 months, and since it is obviously not possible within this limited time to turn out a fully experienced test pilot, the aim is confined to giving the individual a suitable background against which he can, with practical application, develop his own abilities. To this end the flying side of the syllabus is framed broadly as follows:—

Familiarization on new types.

Performance measurements—including partial climbs, ceiling climbs, fuel consumption, take-off measurements, and cooling tests.

Handling—including assessment of longitudinal, lateral, and directional stability, manoeuvrability; spinning; determination of stalling speeds; and asymmetrical handling and performance.

The School's fleet of aircraft is established to include a range of up-to-date types and at present

comprises Lincoln, Mosquito, Meteor, Vampire, Tempest II, Seafire 47, Sea Fury, Firefly, Harvard, Oxford, Anson XIX, Dominie, Auster, and Olympia sail-planes—the last named being mainly for recreation.

Backing Practice with Theory

All aspects of work connected with the measurement of aircraft performance and the assessment of its general stability and handling properties are dealt with in the technical side of the syllabus, the detailed instructions covering:—

General principles of flight and various aerodynamic calculations concerned with the correction of aircraft performance to standard conditions for reciprocating and jet engine aircraft.

Elementary study and analysis of aircraft stability and control behaviour.

A number of lectures by members of the staff of the Royal Aircraft Establishment on the various aspects of research being done in their particular departments, coupled with visits to the departments concerned.

Visits to various aircraft firms for the purpose of seeing the type of work in progress and establishing contacts with members of the flying and technical staffs of the industry.

Learning in Books

As a further indication of the subjects covered in the syllabus, the books listed below are recommended for the pre-course study:

<i>Title</i>	<i>Author</i>	<i>Publisher</i>
SCHOOL CERTIFICATE ALGEBRA	Durrell	Bell (or similar textbook)
SCHOOL MECHANICS, <i>Parts 1 and 2</i>	Durrell	Bell
DYNAMICS AND STATICS	Fewdry	Bell
CALCULUS MADE EASY	S. P. Thompson	Pitman
*ELEMENTARY APPLIED AERODYNAMICS	Whitlock	Oxford University Press
FLIGHT WITHOUT FORMULAE	Kermode	Pitman
*ELEMENTARY AERODYNAMICS	Piercy	English University Press
*TECHNICAL AERODYNAMICS	Wood	McGraw Hill
AEROPLANE PERFORMANCE THEORY	Davison	Pitman

**Particularly recommended*

Although such preliminary preparation would prove of great advantage to a student during the course, all of the studies are nevertheless started from the most elementary stages and dealt with from there by School lecturers.

At first sight the technical syllabus might appear somewhat formidable, so it must be emphasized that its purpose is not to create a technician out of a pilot, but rather to provide him essentially with a clearer understanding of the tasks he will be called on to do, and to increase his power of flight analysis.

Qualifying for the Course

Obviously, before a pilot can be accepted for a course of this nature, it is essential that he has certain qualifications.

R.A.F. candidates must hold Permanent Commissions or have three years' service to complete from the commencement of the course, and have a medical category not lower than A2b. In addition, they should:

Be under the age of 30 at the date the course begins. Exceptions to this upper age limit can be made only against really outstanding flying and academic qualifications.

Be experienced in the flying of at least 10 different types of aircraft (which may include elementary and training types).

Have flown a minimum of 750 hours as first pilot. This qualification has recently been reduced from 1,000 hours).

Be assessed as having "exceptional" or "above average" ability as a pilot.

Be educated to at least matriculation standard in mathematics or an approved



The McKenna Trophy

science, or equivalent standard. Any additional academic attributes are of great value and will be favourably regarded at the selection stage.

Mostly the weaknesses encountered in the selection stage are on the academic side, and aspirants to the course should brush up on their mathematics.

A Trophy for Achievement

Mention must be made, of course, of the McKenna Trophy. This was instituted in 1945 as a memorial to the late Group Captain J. F. X. McKenna, A.F.C., B.Sc., F.R.Ae.S., an earlier Commandant, and is presented to the best all-round student on each course. It marks its possessor as an outstanding potential in a field of flying that can justly be claimed as both fascinating and productive, and into which the Empire Test Pilots' School provides a path.



TAXPAYERS TAKE NOTE

"It behooves countries whose people, like all free peoples, object to paying for large military establishments, to see to it that they are at least strong enough to gain the time to turn the spirit and capacity of their subjects into the new activities which war calls for."—Mahan.

Four Lessons in Sailplaning



(Condensed from an article by Terence Horsley in
"The Aeroplane")

Three abortive, unsuccessful and quite undistinguished cross-country journeys in a sailplane have taught me during the past few months how little I know about meteorology.

THE CABLE WAS RELEASED at 2,000 feet over Manchester's airport at Ringway. The sky was covered with seven-tenths cumulus, of an uncertain character, and the journey from here across the Pennines twenty miles away was accomplished through a strong mixture of faith, hope and charity.

Ninety minutes later the clouds had let me down over a barren and stony waste peculiar to the Peak District of Derbyshire. To right and left there were stone walls, steep slopes, and hard places for a glider landing. Ahead was a quarry, eaten into the face of a minor valley, filled with sunshine, and facing the north-westerly wind. Beyond the lip of the quarry was a level stretch of high ground which in turn disappeared, a mile or two on, into yet another precipitous little valley.

To cut a long story short, I failed to find either hill lift or thermal from the cliffs below me, and set off down-wind with a few hundred feet in hand, with one eye on the next valley and the other on any smooth piece of ground on which to land. Failing to find a field, I slipped over the cliffs into what my imagination tells me was a gorge, but what my map reports as a steep little valley with ground just over 1,000 feet on either hand, blessed with an escape road to the south, twisting and turning amongst steeply-wooded slopes, disgorging eventually into the civilized agricultural country to the north of Derby.

In the bottom of the gorge was the village of Wirksworth, apparently poured into the bottom of a sunlit bowl. At the back of the village, eaten out of the hillside, was yet another typical quarry.

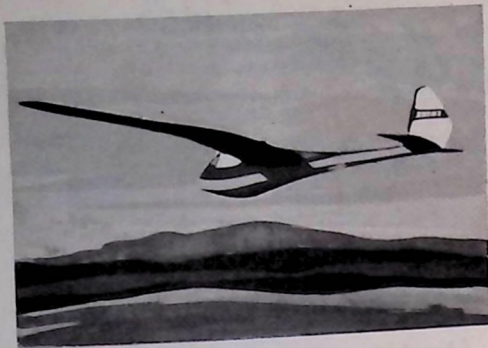
I spent half an hour of intense excitement over the village. Puffs of up-draught, like the belches of a monster, came from the quarry. In each one I circled, gaining a few hundred feet, and drifting on four occasions over the back of the opposite "wall."

Every thermal produced not less than three feet per second lift; they all continued for about 1,000 feet, which was 300 or 400 feet above the tops of the enclosing walls of hill. The bowl with the town, sheltered from the wind, lying exposed to the sun, was a perpetual furnace, and I have no doubt that one could have remained there for the rest of the day. That wind shadow thermals should continue for so long and so continuously was new to me.

At the end of half an hour a thermal which commenced life over the roofs of the village didn't stop at a thousand feet like the others, but went on, and finished at 15 feet per second, 4,000 feet overhead in a cloud. Naturally, I then left Wirksworth, and shall probably never see it again.

A few weeks earlier I found myself over Newark, at minus 600 feet on the altimeter, and remained roughly at this height for the following hour. This was another reminder of the adage that while there's life there's hope.

For one hour I sat in nine weak thermals over Winthorpe aerodrome outside the town, and on five occasions made a preliminary run in for a landing on the football pitch on the western side of the aerodrome. Overhead, the sky had tempo-



rarily clouded over with stratus at about 4,000 feet, so there wasn't even a gleam of sun to give a thermal an excuse.

It was therefore all the more remarkable that the concrete runways and hangars should continue to exude these gentle breaths. I think it possible that stretches of concrete like this, which have been heated up to a very considerable temperature just previously, will continue to release blocks of rising air for a long time after the sun is withdrawn. I remained between 400 and 1,200 feet over the ground in virtually windless conditions for 60 minutes, checked by the barograph chart.

At the end of this time the stratus broke up, the sun shone again. Almost immediately the ninth weak thermal accelerated and expanded, increasing from 3 feet per second at a thousand feet, and finishing up at 10 feet per second at cloud-base.

It was only the lateness of the hour, and the sight of a very active RAF aerodrome below (Swinderby) that decided me to give up the attempt to reach the coast, and instead to impose myself upon the hospitality of the Air Force.

On a third occasion I was aero-towed from Woodford, and cast off under a growing storm a few miles away. The up-current was of the order of 10 feet per second, accompanied by quite rough air. Looking for conditions more to my taste, I flew into a belt of rain, which was coming down at the edge of the cloud, apparently solid.

The interest here was not the noise of the rain, the force of the water squirting on to my knees, down my neck and everywhere else, but the continued lift in the belt of rain. I climbed blindly through this at three feet per second for 1,000 feet in absolutely smooth air. This was something I had not previously encountered.

This lift, however, ceased within the cloud itself; so I flew out of its edge with a view to exploring again the black-hearted core with its rougher conditions. I had already lost sufficient height to get in under the base, and was about to put my failing courage to the test, when a flash of lightning, which came from nowhere and existed everywhere during its millionth-of-a-second-life, dissuaded me. I turned back in unblushing panic, and 15 minutes later landed at Woodford.

* * *

Lastly, there was just one other lesson which these three insignificant flights drove home. The journey from Ringway to Heanor was made in cloud during its initial stages—the sort of cloud which is not only safe, but kind to its visitor. Until then I had generally upset the aircraft in cloud through inefficient flying or had retreated in mild terror after a preliminary canter. My excuse was that wartime flying had accustomed me to an artificial horizon.

It was this occasion which made me realize that the piece of string which flutters from the pitot head of all sailplanes is a very efficient instrument. By the simple process of following the string with the control column, it seemed possible to eliminate completely that dreadful feeling of slipping over the edge of the world which bad instrument fliers experience while making blind turns. Instead, by a rigid adherence to the turn-and-bank indicator, pinning the bottom needle to its prescribed rate of turn, plus a slavish adherence to the piece of string, the aircraft remained unusually docile.



Have You Seen these Posters?



RCAF Poster No. 52: Magneto - Bendix Scintilla

RCAF Poster No. 53: Now Available - D.V.A. Educational Service

RCAF Poster No. 54: Tidiness Breeds Safety

RCAF Poster No. 55: Lubrication System - Dry Sump Radial Engine

ORDER WHAT YOU WANT FROM YOUR SUPPLY SECTION



JUBILEE GROUP

Caught by the camera in relaxed mood after the Mess Dinner held in Ottawa to celebrate the RCAF's 25th anniversary, are (left to right): Group Capt. A. O. Adams, O.B.E.; Air Vice-Marshal C. R. Stemon, C.B., C.B.E.; Air Marshal W. A. Curtis, C.B., C.B.E.; Air Chief Marshal L. S. Breadner, C.B., D.S.C.; Air Commodore D. E. MacKell, C.B.E.; Air Marshal R. Leckie, C.B., D.S.O., D.S.C., D.F.C.

First Graduate

THE FIRST Private Pilot License under the new Government-subsidized Flying Training Plan was issued on March 17th to Mr. Charles S. Carew, a wartime RCAF navigator. The plan provides for 30 hours' flying, twelve of which must be dual, and a full course of ground instruction. Mr. Carew is here shown receiving Private Pilot License No. 1 from Mr. Donald W. Saunders, the District Inspector of Air Regulations.



THE TIRELESS GOBLIN

Vampire pilots and maintenance personnel will be interested by the following telegram received from England by the De Havilland Aircraft Company of Canada on April 4th.

ON MARCH THIRTYFIRST A STANDARD GOBLIN ENGINE SUCCESSFULLY COMPLETED ONE THOUSAND HOURS OFFICIALLY OBSERVED TRIAL ON TEST BED IN SEVEREST COMBAT CONDITIONS. NO AERO ENGINE EVER BEEN SUBJECTED TO TEST OF THIS DURATION AND INTENSITY. MAINTENANCE WAS NEGLIGIBLE AND PERFORMANCE EQUAL TO NEW THROUGHOUT. ENGINE DISMANTLED ONCE AT FIVE HUNDRED HOURS FOR INSPECTION AND LESS THAN TEN PERCENT NEW PARTS FITTED. OTHER MAINTENANCE TOTALLED ONLY SIXTY MAN HOURS AND NEGLIGIBLE REPLACEMENTS FOR THOUSAND HOURS RUNNING IN MOST GRUELING WAR CONDITIONS COMPRISING FULL POWER TAKE OFF CLIMB CRUISING THEN FIVE MINUTES FULL POWER COMBAT THEN DESCENT AND TEN MINUTES REST. THE WHOLE SEQUENCE OF SEVENTYFIVE MINUTES REPEATED 924 TIMES OVER SIXTEEN WEEKS AND INCLUDING ONE HUNDRED HOURS FULL POWER 79 HOURS MAXIMUM CLIMBING POWER 544 HOURS MAXIMUM CRUISING POWER 5544 RAPID ACCELERATIONS. RUNNING TIME REPRESENTS SIXTEEN ROUND WORLD BUT WITH INNUMERABLE SUDDEN SPEED FLUCTUATIONS. AFTER SECOND INSPECTION INTENTION IS TO RESUME ORDEAL. ENGINE IS STANDARD GOBLIN MARK TWO TAKEN FROM ROYAL AIR FORCE BATCH ONE YEAR AGO AND NO LATER IMPROVEMENTS PERMITTED. TEST PROVES THAT OUR TYPE CENTRIFUGAL TURBINE IN EIGHT YEARS FROM START OF DESIGN HAS SURPASSED ALL PISTON ENGINE ACHIEVEMENT IN MATTER OF DURABILITY. LATER MARKS GOBLIN NOT ONLY SUPERIOR IN THIS RESPECT BUT ALSO MUCH MORE POWERFUL. LARGER GHOST ENGINE WHICH ALREADY HAS TYPE APPROVAL FOR PUBLIC TRANSPORT AND WILL FIGURE IN FIGHTER DEVELOPMENTS INCORPORATES ENTIRE GOBLIN EXPERIENCE AND WILL DOUBTLESS SURPASS GOBLIN DURABILITY AND MAINTAIN TRUE GIPSY TRADITION.
DE HAVILLAND ENGINE COMPANY

LETTERS to the EDITOR

AN ARTIST SPEAKS

Sir:

AFAO A27/11, paras. 4 and 5, deals with the cleaning of linoleum and composition floors. The whole art and skill of the thing is not, however, set forth. Therefore the following monograph may possibly be of some interest to actual or intending practitioners of this important science.

First of all let us read the instructions on a bottle of shampoo. "Mix 1 tablespoonful of shampoo with $\frac{1}{4}$ cup of water. Wet the hair. Apply half the above solution and work thoroughly through the hair. Rinse. Give second sudsing. Rinse several times." Hair, of course, is not usually as dirty as the floor we're going to wash, but the principle is the same.

Instead of liquid shampoo, we shall use a solution of issue Soap Household (33D/13). Cut a one-pound bar in small pieces and add to one gallon of hot water. Keep this mixture at a temperature just under boiling point, stirring occasionally until the soap is completely dissolved. A pint of this solution added to a pail of water makes an ideal washing mixture.

Pour half the contents of the pail on the floor. Work the soapy water over the surface with a mop, using a figure-of-eight movement. Don't wash too large an area at once: about six feet by twenty is sufficient. Pull the mop—don't push it. Pushing bunches the ends of the strings and causes knots. At the end of each stroke turn the mop over smoothly. Snapping or slapping it over will only result in splashing the walls.

When the soapy water has been well worked over the above-specified area, pick up as much as possible of it with the mop. The next step is rinsing. Use fresh hot water liberally, in order to float off the soapy residue. Then mop up the rinse water with a clean dry mop. Carry out a second rinsing if necessary, finally mopping the floor as dry as you conveniently can.

The primary consideration for a successful job is frequent rinsing of the mop and frequent changing of the water in the mop bucket. If the mop is merely wrung out instead of rinsed, the water only is removed while the dirt remains in the mop and is returned in due course to the floor.

In order to clean a corner, bunch the mop (liberally soaked with soapy water) against the corner and squeeze several times. Rinse and dry.

After the job is finished the mop should again be thoroughly rinsed, first in soapy water, then in clear water, and finally in a chlorine solution (as laid down in AFAO A60/7).

The true professor of floor-washing watches his temperatures. He will, when dealing with an unpainted floor, keep his water

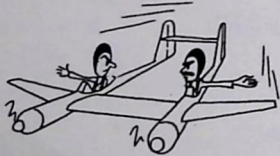


extremely hot. On painted or varnished floors, on the other hand, his water will be somewhat cooler. The use of lye he regards as brutal. He will only descend to it when faced with the most greasy type of floor, and then only with the utmost caution.

LAC A. J. Fergusson

Answers to "What's the Score?"

1 : B	2 : D	3 : B	4 : C
5 : A	6 : C	7 : D	8 : D
9 : B	10 : A	11 : C	12 : C
13 : A	14 : D	15 : B	16 : D
17 : C	18 : C	19 : C	20 : A





AIR FORCE DAY

JUNE 11th



LET US ALL PUT FORTH OUR
BEST EFFORT TO SHOW CANADA
WHAT THE R.C.A.F. MEANS



