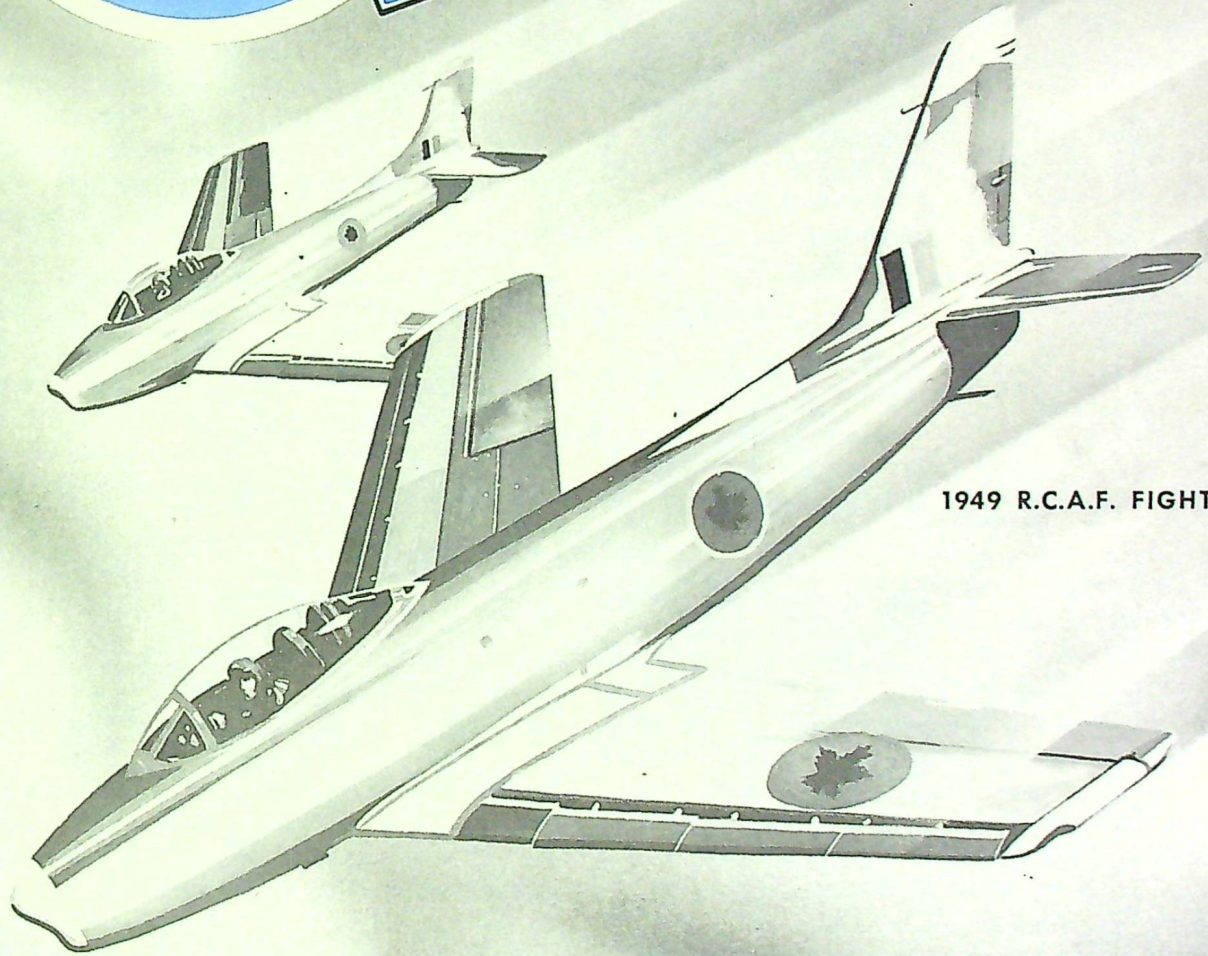


# *The* ROUNDDEL



1949 R.C.A.F. FIGHTERS

VOL. I, No. 4  
FEBRUARY 1949



Issued on the Authority of  
THE CHIEF OF THE AIR STAFF  
Royal Canadian Air Force

VOL. I, No. 4

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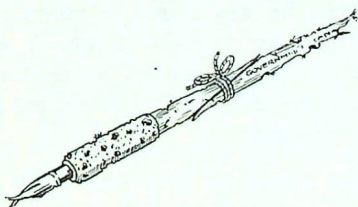
# SHATTERPROOF

## DOES THE BIG THING

Sir:

Though seriously tempted to seek redress of grievances, I have decided to do the big thing and accept your apology for having forged my signature in your December issue. At the same time, it is useless to pretend that the incident has not cast a temporary shadow across our relationship. While I fully realise that executive signatures like mine are seldom legible, I still find it hard to understand how you could have mistaken it (I quote your letter) for "the trail of a bluebottle carousing across the notepaper after a debauch in the ink-well."

Your question—"which end of the pen did you use to sign your name?"—reveals a lack of perception that bodes no good for "The Roundel." I used the nib. It is naturally a little worn, for that pen has served His Majesty loyally for nearly



twenty-five years. Up to the sudden termination of my second tour of duty as a WO2 it had written more than fifteen thousand letters of constructive criticism to most of our senior officers, politicians, and leading editors.

My failure to visit you this month, however, has nothing to do with the above matter. Uncompromising Shatterproof may sometimes be—perhaps, as his enemies say, occasionally even a

little harsh—but never small. The reason for my absence is this: I am lobbying. Cpl. Spyder happened to overhear Sqdn. Ldr. Bostitch recently mention my name to the C.O. while they were discussing the possible trend of promotions over the next ten years. I therefore feel that it is only tactful to pass alertly across the C.O.'s line of



vision as frequently as possible. By careful strategy I find that I can manage to do this almost thirty times a day—and still allow Sqdn. Ldr. Bostitch a dozen or so glimpses as well. WO1 Gallstone is, I need hardly say, doing his best to upset my plans. He called me to attention this morning as I was proceeding smartly at the double in order to intercept the C.O. on his way to the hangar area. He then crudely advised me that if I didn't stop darting about the Station like a jet-propelled sack of intestines he'd profanely see that the blasphemous M.O. gave me something to unrepeatably gallop about.

Besides lobbying, I have (with the help of LAC Bladder, the gifted young airman of whom I have spoken to you before) been preparing an inaugural address to deliver in the Mess if my promotion

comes through. The ending is particularly fine. It goes like this:

*"The Shatterproof who stands before you tonight, humbly and thankfully conscious of the new and mighty powers that have this day been vested in him, is that same Shatterproof who, with blood, sweat and tears, has long sought tirelessly to educate the Brass. Let none think that, seeking even greater preferment, I shall now cease from the unequal conflict. Let me rather, standing beside this simple bar and raising my dear-bought lager to the stars, proudly reiterate my faith in the cause of the boys in the field, so that all airmen looking back hereafter shall say, 'This was Shatterproof's finest hour'."*

The crossword puzzle in your January issue had one glaring fault. It was too easy. LAC Bladder did it, he tells me, in less than five



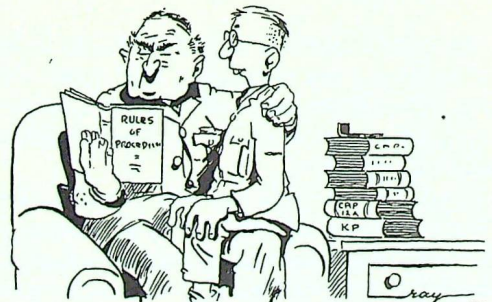
minutes. He therefore proposes to help you by making up one that nobody will be able to solve. He estimates that it will take him about six months. The following sample clue will give you

some idea of the quality of LAC Bladder's mind. Every word used in it may be found in the "Concise Oxford Dictionary."

"Between the subcutaneous envelope of an orange and the gold plate on the mitre of a Jewish high priest who has lost his hind claw, insert (after replacing its adverbial prefix by a headless male and removing its algebraic unknown second quantity) the type of madness from which a werewolf suffers, and you will discover something which is halfway between a man and an ape."

The answer is not, as you might expect, WO1 Gallstone. It is "pithecanthrope."

P.S. I have had to ask LAC Bladder to give up his idea of composing a cross word puzzle. Just as I was sealing this letter, he came crawling into my room on all fours, muttering that he was a twenty-one letter word signifying he'd forgotten what, but that after three pages of clue it looked more like a bull moose, and he didn't like it because the whole thing seemed to be getting a bit out of hand, and if he didn't find the bottom waistcoat button of a celebrated two-headed Spanish ventriloquist he was afraid he might end up by turning into an electric kettle. I eventually succeeded in calming the lad by reading him extracts from the Rules of Procedure, but I think he will bear watching.



# The ROYAL CANADIAN AIR CADETS



by A. Macdonald

## ANNUAL GENERAL MEETING

AS THIS IS WRITTEN, the Air Cadet League of Canada is preparing for one of its most important yearly events—the Annual General Meeting of directors and provincial representatives from across the Dominion. The meeting is being held this year at the Seignior Club, P.Q., scene of some of the League's most successful gatherings in the past.

Purpose of the annual meeting is to hear reports on 1948 activities, to elect new officers and committees for 1949, and to lay plans for the further extension and improvement of what has been described as "Canada's finest youth training movement." High ranking RCAF officers will be in attendance throughout, and it is expected that the retired Chief of the Air Staff—Air Marshal Robert S. Leckie—will participate in the discussions.

A highlight of the two-day business session will be the presence of Air Cadet officials from Britain and the United States. While these visiting officials will be primarily concerned with the forthcoming three-way exchange of Canadian, British and American cadets, they will undoubtedly take advantage of the opportunity to exchange ideas on many other aspects of Air Cadet training. In this connection, it is interesting to note that the principle of joint Service-and-civilian sponsorship is considered to have reached its most advanced and efficient form right here in Canada.

It is sometimes a little difficult for the individual Air Cadet to appreciate the full importance of decisions reached at the annual meeting. This, despite the fact that a single executive decision may have a profound and lasting effect upon his future. To illustrate: at the 1948 meeting, the

League agreed to underwrite 15 Air Cadet scholarships to the newly-opened Canadian Defence Colleges. As we write, 15 young men—all former Air Cadets—are attending the Colleges under League scholarships. The course will prepare them for positions of leadership either in the RCAF or in the expanding field of civil engineering—an opportunity which came their way mainly because a group of League officials made a routine decision during the annual meeting.

## SCHOLARSHIPS

On the subject of Air Cadet League Scholarships, an interesting survey was made recently at North West Air Command. It may be recalled that when the combined RCN/RCAF College, Royal Roads, opened in 1947, a large group of graduate cadets were awarded two-year scholarships by the League and the Dominion government. The Air Cadet section at N.W.A.C. recently checked on the progress being made by the scholarship winners "just to see how they were getting along." Space does not permit a full report on each of the cadets but the following four "capsule reports" may be considered typical.

### Cadet K. Lewis

Cadet Kenneth Lewis is a former member of No. 52 (Calgary) Squadron. In the summer of 1947 he received a flying scholarship which he completed at the Calgary Flying Club. In the Fall, he reported to Royal Roads with a scholarship from the Air Cadet League and started his studies. By the time Spring and "Operation Fledgling" (a flying tour of Air Force establishments across Canada) came along, this ex-Warrant Officer was chosen as Senior Cadet in charge. During the trip, the Flight Cadets spent two weeks at RCAF Station, Trenton, where they

were given their initial flying instruction. At the beginning of the second term, Lewis had the distinction of being appointed the first Cadet Wing Commander in the College, and in addition, he was voted Captain of the First Rucker XV.

## **Cadet L. H. Broughton**

Cadet Lorne H. Broughton of Saskatoon was a Flight Sergeant in No. 107 Squadron before he was awarded an Air Cadet League Scholarship and entered Royal Roads. Broughton presently holds the rank of Cadet Flight Leader at the College, and is manager of the First XV Rucker

team. He received flying training along with Lewis at Trenton last Spring, and is recommended for further pilot training. On completion of the course at Royal Roads, this Flight Cadet intends to continue his studies at the University of British Columbia and to join the RCAF Auxiliary.

## **Cadet L. D. Crawford**

Attending the College under a Dominion Cadetship, Larmour D. Crawford, an ex-Sergeant of No. 89 (Victoria) Squadron has held the rank of Cadet Flight Leader. Cadet Crawford will continue his pilot training and intends to follow a



*Retiring President C. D. Taylor (left) congratulates incoming President D. Alex Ross, while the Hon. Brooke Claxton and Mr. L. S. Marsh look on.*



(Left to right) General Lucas V. Beau, Mr. C. D. Taylor, Hon. Brooke Claxton, Mr. D. A. Ross (League President), Air Marshal W. A. Curtis.

general and technical list career in the RCAF Regular.

#### **Cadet Witt**

Cadet Witt of Morden, Manitoba, intends to complete his studies at the University of Toronto, after graduating from Royal Roads, and to fly under the University Air Training Plan. Witt was a Cadet Flight Sergeant with No. 309 (Morden) Squadron. He took the trip with the rest of the Flight Cadets on "Operation Fledgling," and on completion of his initial flying instruction at Trenton, was recommended for further Pilot training.

#### **A CASE HISTORY**

In view of the widespread publicity given to exchange visits, flying training, and other newsworthy aspects of the Air Cadet programme, it is often easy to lose sight of the fact that the real

strength of the movement lies in the routine week-to-week activities of some 175 local squadrons. For many of these squadrons a healthy future is assured by the interest and support of the sponsoring body. But for others—well, the experiences of No. 217 Squadron, Princeton, B.C., may help to illustrate what can happen.

A report on No. 217 Squadron, prepared by civilian committee chairman A. R. Eastcott, turned up recently in Ottawa. It is an interesting document, not because of its literary style, but because it illustrates what can be accomplished by a group of boys under the proper kind of supervision. The ensuing paragraphs were taken from the report, which is too lengthy to reproduce in full.

"The old No. 217 (Princeton) Squadron was unique, inasmuch as it had the distinction of being one of the sloppiest squadrons in the west,

harrassed by more difficulties than many a more efficient squadron could be expected to take. In September 1947 there was sponsor trouble, C.O. trouble, lack of quarters, an empty treasury, lack of instructors, and an apathetic community.

"Lack of quarters appeared to be the No. 1 problem: there seemed to be no accommodation and little community interest in finding any. However, it was finally discovered that there was an unused basement under the hall of a fraternal order. The chairman, not being a member, had friends intercede on his behalf, and the squadron fell heir to a ten-year lease to an unlighted 40' x 50' basement with a very wet dirt floor.

"By mid-winter the squadron had reached an all-time low. The boys kept away from parades in large numbers. The able C.O., who had been appointed in November, got tired of lecturing to six or seven boys, and requested to be relieved of

his duties. In order to keep the squadron together, the committee organized an Air Cadet hockey team. As money was not available for equipment, it was called the "Princeton Juvenile Team," and local merchants were dunned for uniforms and equipment. But it was an Air Cadet show nevertheless. All the boys on the team were cadets, the members of the Committee provided transportation for out-of-town games, one committee member acted as team manager, another as goal umpire, and the chairman (who is usually in the dog house) as penalty box timekeeper.

"By the end of the hockey season it appeared obvious that the squadron must disband, as all appeals for funds had failed. The cost of installing entrances, electric lighting, a drainage system and a concrete floor in the dark, dirty cellar was estimated at \$1300. As a last resort it was decided to place the facts before the boys. They were



*Hon. Brooke Claxton addresses guests at annual dinner. Other head table guests (left to right) are: Maj. Gen. Lucas V. Beau (Commander, U.S. Civil Air Patrol), Air Marshal Robert S. Leckie, Mr. C. Douglas Taylor, Air Marshal W. A. Curtis, Mr. D. A. Ross, Mr. D. Gibson (President, Navy League of Canada).*

called together and told what they stood to lose by their own and their parents' lack of interest.

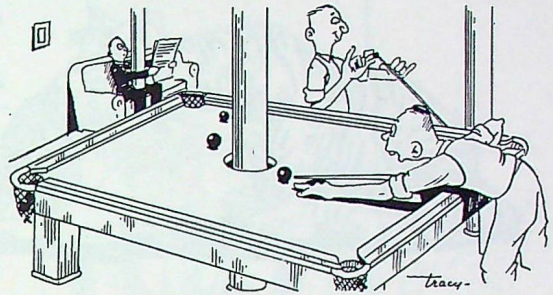
"This approach worked wonders. At the suggestion of the boys it was decided to hold a party for the parents. A hall was secured for free, the boys did the advertising by means of handbills, mimeographed at school, all training equipment was carried to the hall and suitably displayed. The party was a success. Those present contributed \$30.90 towards building materials and all promised to support the forthcoming drive for funds. At the conclusion of the meeting the boys served coffee, sandwiches and cake provided by a few of their mothers. For once the boys were smartly uniformed and even their hands were clean.

"About a week after the meeting the boys held a tag day. This was followed by a sale of raffle tickets, politely called membership cards in the Similkameen Valley Air Cadet Association. The Squadron bank account stood at \$514.35—but there was still a \$1300 job to be done. Faced with this unpleasant fact, the boys decided to tackle the job themselves.

"To date they have completed the installation of a lighting system, the laying of the tile drainage pipes connected to a storm sewer, the laying of a concrete floor 40' x 50', the installation of a separate entrance and stairway to the basement, and the construction of a fire exit. All this has been done without outside labour. Even the huge amount of gravel required for the concrete floor was dug out of the Similkameen River by the boys, the committee merely provided hot dogs for the occasion. The trucking was done by one of the older boys with his father's truck. The lighting was installed in conduit, according to the Underwriter's Code, by the boys under supervision of an unpaid electrician.

"Total cost of the project was \$335—almost \$1000 less than the estimated contractors' cost!

"The quarters are now ready, and as soon as lockers are constructed the squadron equipment will be moved in. The quarters are not exactly a drill hall, as there are pillars supporting the floor above, but they are adequate for lectures and storing equipment. The place has been converted into an Air Cadet Club room to be used every



evening. A pool table, ping-pong table and chesterfield have been "scrounged" from local citizens, and other furniture will be constructed by the boys themselves.

"Returning now to the spring of 1947, the commencement of the drive for funds was the turning point in the fortunes of the squadron. When the boys were faced with the responsibility of raising their own funds and building their own quarters, they came through like well-disciplined soldiers. Several new boys came in shortly after the drive commenced and by the Annual Inspection in May, 30 cadets were on parade. Strange as it may seem, this unique squadron was no longer sloppy. The boys managed to make a good impression on the reviewing officer, who gave them a very encouraging talk.

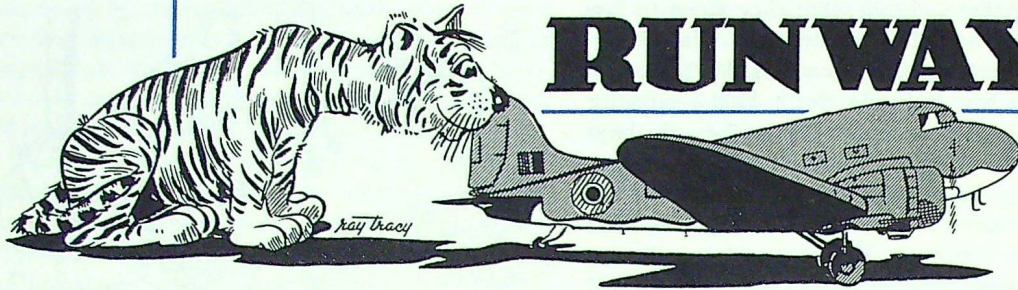
"The party at which the cadets were hosts to their parents and friends will become an annual event, probably during Air Cadet week in April. This will enable the committee to give an account of itself and may afford an opportunity of obtaining further support from the citizens of Princeton."

\* \* \*

It would be difficult, indeed, to find a more sincere tribute to the value of Air Cadet training than the simple facts contained in the above paragraphs. No 217 Squadron is not a large unit, but there can be no doubt that it will some day be one of the most efficient squadrons in Canada.



# THERE'S A TIGER ON THE RUNWAY!



A day in the life of a pilot on the Madras-Lucknow Run.

(Reprinted by courtesy of "The Aeroplane")

YOU START OUT AT FIVE IN THE MORNING on the most dangerous part of the journey—the drive from the hotel to the airfield. Even at that hour the roads are crowded and your driver has a Paris taxi driver for a father and his mother was a woman driver anyway. It cannot be said that he sounds his horn a lot—rather let it be said that he rests his hand on the button and occasionally takes it off. The same can be said of his foot on the accelerator, except that he never takes that off.

Already a mass of jangling nerves, you arrive at the airfield to be told by the Meteorological Officer that the Monsoon is in full cry over Central India and that it will be raining at every other airfield. This you may disbelieve—it will be raining at every single airfield on which you are going to land.

The passengers are already sitting in the aircraft looking as though they have slept there all night; you find out later that some of them have. Making your way to the cockpit, you find that the windows are all closed, and Madras, even at 05.45 hrs., can be like a Kew hothouse in Summer. Eventually, with the somewhat unwilling aid of your co-pilot, you coax the Dakota into the air and head it towards Bangalore.

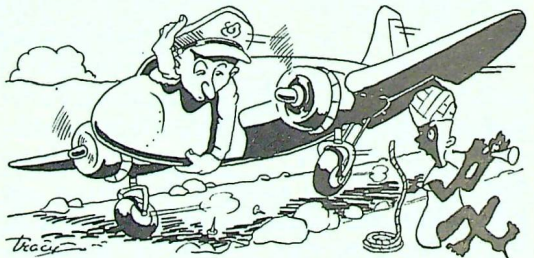
Now a word about the Dakota. First let me say that the Dakota is a wonderful aircraft. I think that Mr. Douglas was already designing it when somebody called Wright beat him to it at Kitty-Hawk, North Carolina. He has the last laugh,

though, because people are still flying the Dakota. Ours is an ex-U.S. Army conversion and still has the chewing-gum on the dashboard to prove it.

The trip to Bangalore is uneventful and is one hour's rather pleasant flying along the River Palar, with a good view of one of India's biggest jails, at Vellore. When you see the moat which surrounds it, complete with duty crocodiles, you see why they say that no prisoner has ever escaped from there. The rich Kolar goldfields are beneath you now and soon Bangalore is in sight.

The man who designed the Big Dipper at Blackpool inspired the builder of the one and only runway at Bangalore. One never makes two similar landings here. You either fly right into the runway or hold off and find the runway has gone and you are left, feeling like the proverbial spare man at the wedding, with 10 ft. of air beneath you, and the aircraft going down hard.

After refuelling, you have the problem of take-off to consider. There are two schools of thought. You can either put both your feet on the control column and hold the aircraft down until you get over the bump in the centre and carry on downhill, or you can act rather like one of those comic divers and belt, hell-for-leather, uphill, reach the



bump and keep on going, with legs or, rather props churning madly in the effort to keep you in the air. These take-offs are watched with great interest from the Control Tower, and many rupees change hands on where an aircraft will leave the ground and, sometimes where, and with what consequences, it will reunite with Mother Earth.

During the next four hours you are in for 3 hours and 59 minutes' solid cloud flying until you reach Nagpur. The one-minute's break is a beautiful patch of clear blue sky over Hyderabad, for which, rumour had it, the Clerk of the Weather was paid fantastic sums, so that various enterprising people could bring in supplies of medicine that smelled of cordite.

As a matter of courtesy, you now stroll back to see whether any of the passengers are still alive and to do what is known as **KEEPING THE CUSTOMER INTERESTED**. This consists of asking such thought-provoking questions as: "Are you feeling sick?" and "Do you know you musn't smoke in the lavatory?" For no reason at all this always brings forth the counter-question of: "At what height are we flying and why?" One old gentleman who looked a bit anxious asked me how many engines we had got—and when I had glanced out to make certain and said "Two," he asked me why I had to use them both at once.

At Nagpur one takes lunch and then it's in and out of the valleys and up the road to Jubbulpore. You daren't go above the cloud, for "Jub," as it is known, is 2,000 ft. up and has no radio aids. Once I was greeted there by a very thankful Traffic Assistant. Three tigers had been prowling around all day and had only gone when they heard the sound of my engines. Once a tiger killed a cow on the runway and six of the aerodrome personnel waited for it to come back one night. They lay in the grass, possessing between them one muzzle-loading shotgun, two cartridges, one knife, a torch (a big one, though!) and a lot more courage than I have. There were lucky, however, because the tiger did not have the grace to show up.

Now we're off again to Allahabad, and this time, just as I am landing, a fox runs across the runway and narrowly escapes death. We collect a bottle of water from the Ganges for our secretary

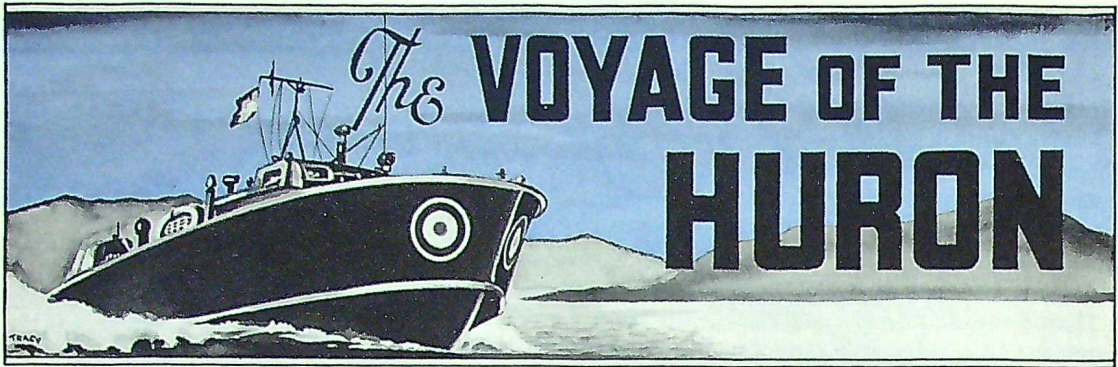


and then fly low over the sacred river to Cawnpore.

Cawnpore has the only curved runway I have ever seen. Dodging through vultures, we land and discover that there is a lot of hydraulic fluid leaking on to the ground. As the last stop of our journey, Lucknow, is only 20 minutes' flying time away, I make the decision to fly there without selecting "wheels up" in case I can't get them down again. Taking-off and hitting a kite-hawk in the process, we make a very slow journey to Lucknow, because the undercarriage reduces our speed. It is only when we are safely on the ground that I find that the fluid was leaking from a spare can that is carried for emergencies.

So here we are at last, having covered 1,300 miles in one day. We have hazarded tigers, foxes, vultures, crows and kites and still have the drive to town to face. This is slightly worse than the one at Madras, because there is always a passenger who has a train to catch; therefore the driver goes fast. Closing your eyes to lessen the strain, you think about the beer you bought at Jubbulpore at only 2s. 6d. per bottle instead of the usual 6s. anywhere else. It's the only consoling thought, because you have to go all the way back to-morrow.—R.L.

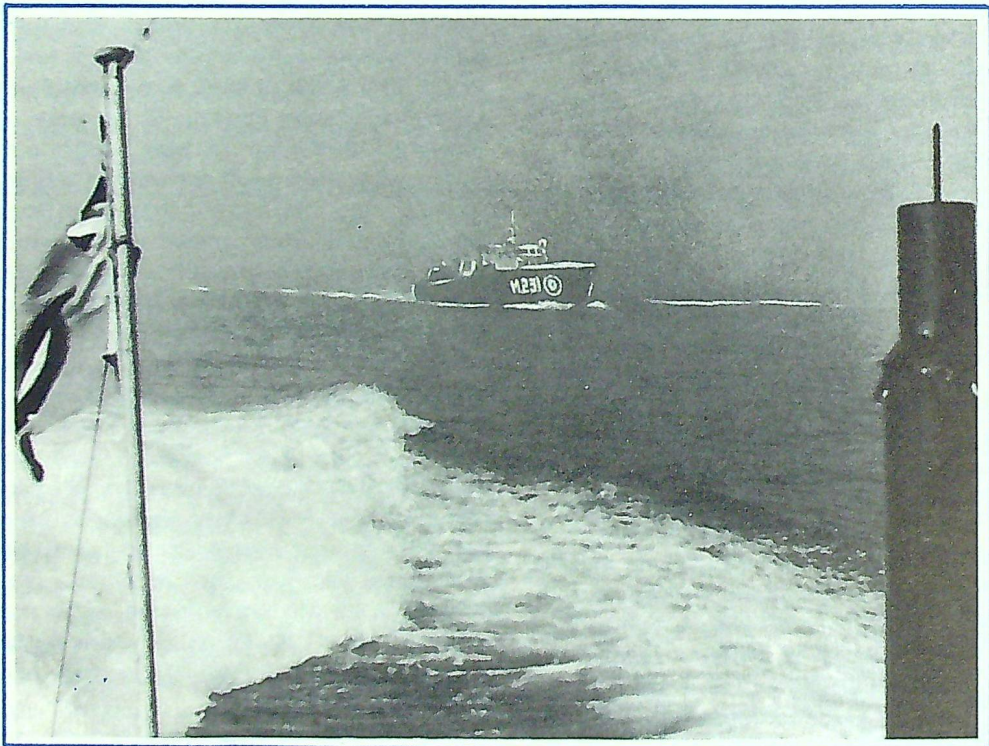




On a foggy morning last November the "Huron," one of the three high-speed rescue vessels operated by 122 Marine Squadron, left its Base at Patricia Bay on a 5-day trip round Vancouver Island. The purpose of the trip was to try out its newly-installed radar equipment.

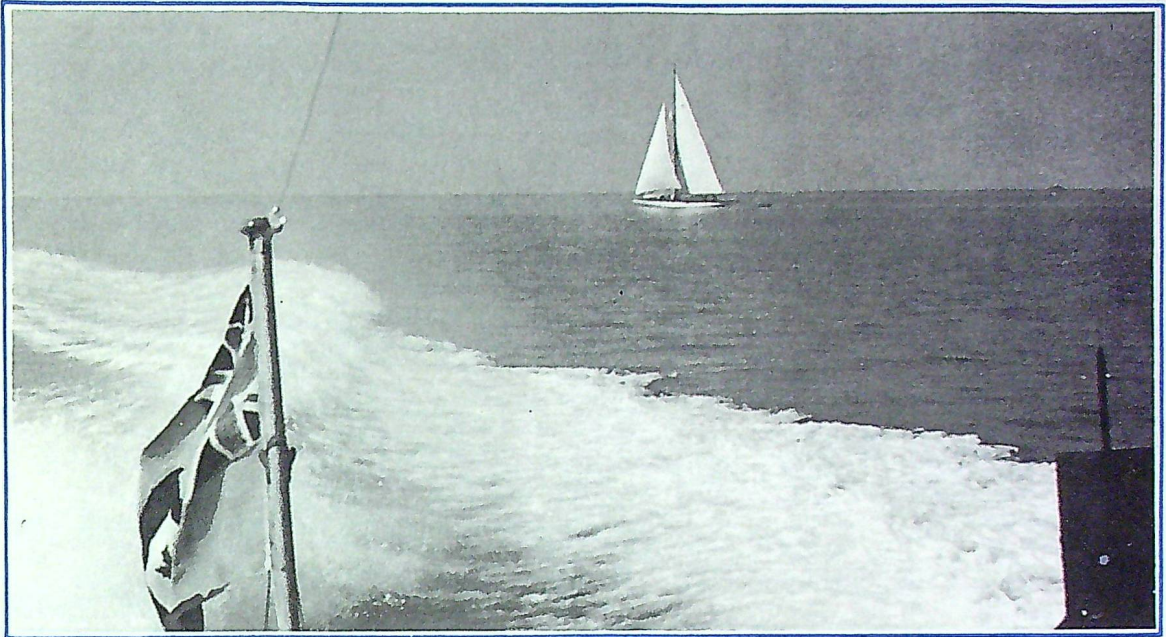
The following photographs, taken by Flt. Sgt. B. G. Moodie, tell the story far better than words could do it. They also reveal the fact that Flt. Sgt. Moodie, in addition to being Chief Engineer of the "Huron," is an amateur photographer of no mean ability.

*(Permission to reproduce any of the following photographs must be obtained direct from Flt. Sgt. B. G. Moodie, 122 Marine Squadron, RCAF, Patricia Bay, B.C.)*

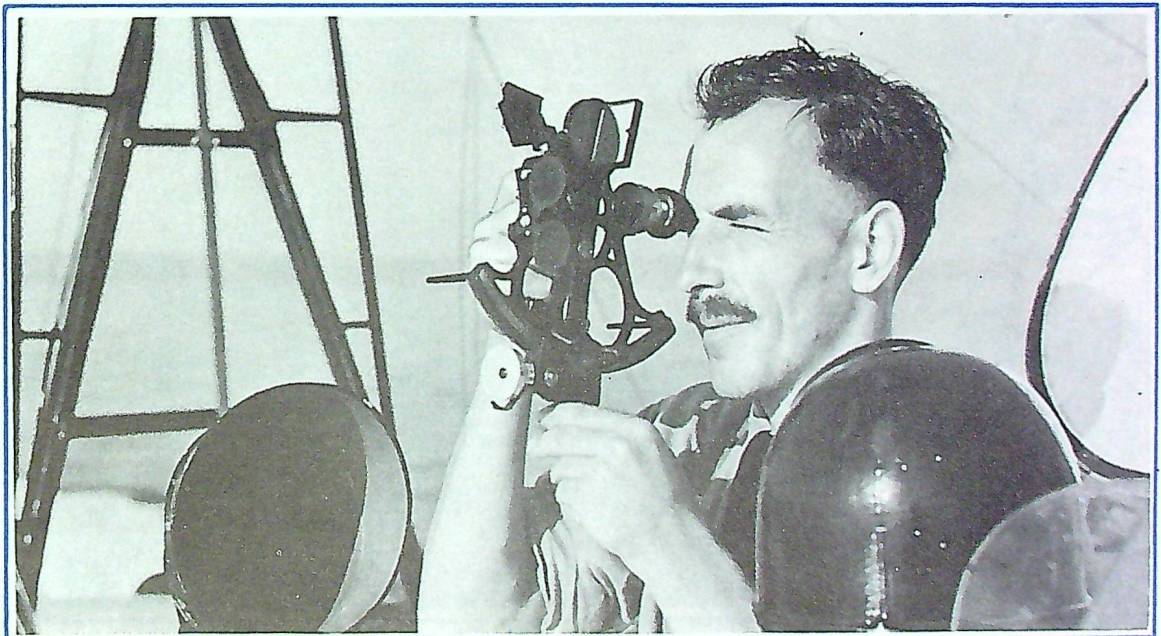


*A thick morning fog, as M235 "Huron" sets out on her trip, affords an early opportunity to try out the radar. The "Huron" leads out the "Malecite," another of the Squadron's vessels, as the latter starts off on a short patrol.*

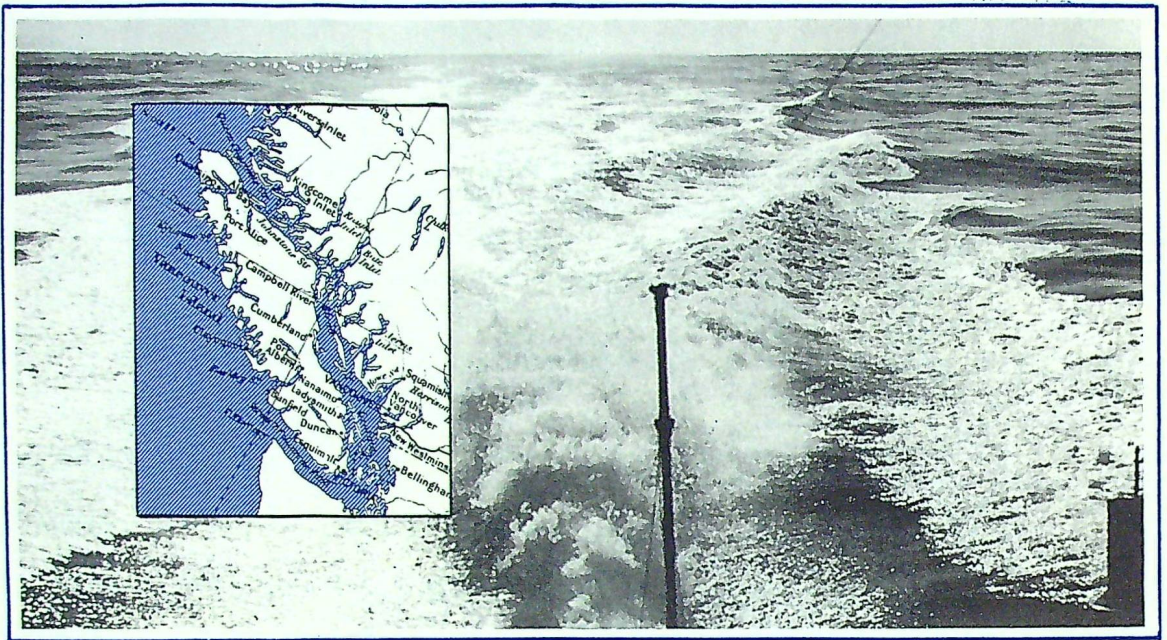
## The Roundel



*By the time the "Huron" reaches Victoria, the fog has melted to a blue autumn haze. Here the speedy craft roars through the quiet waters past a slow-gliding yacht.*



*The Skipper, Flt. Sgt. Jack Phillips, gets in a little practice with his sextant. Flt. Sgt. Phillips took a holiday from the Marine Section in 1941 to fly an operational tour in C-47's.*



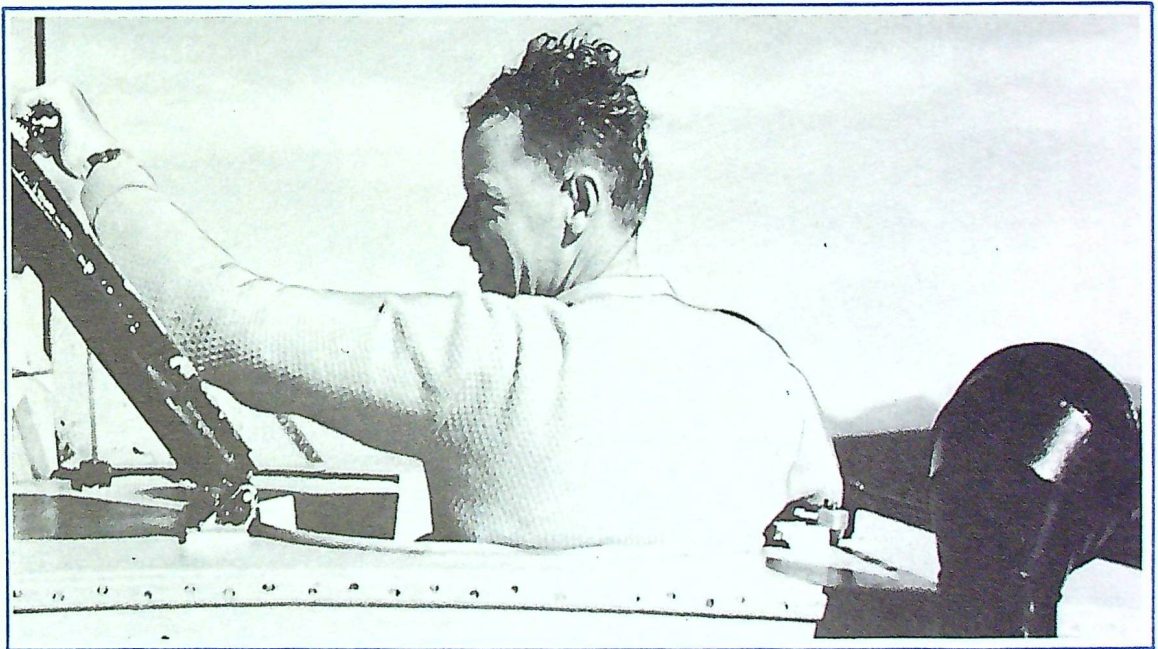
The "Huron's" wake, as her twin 1500 horse-power Packard engines drive her out beyond the sheltered Straits of Juan de Fuca into the open Pacific.



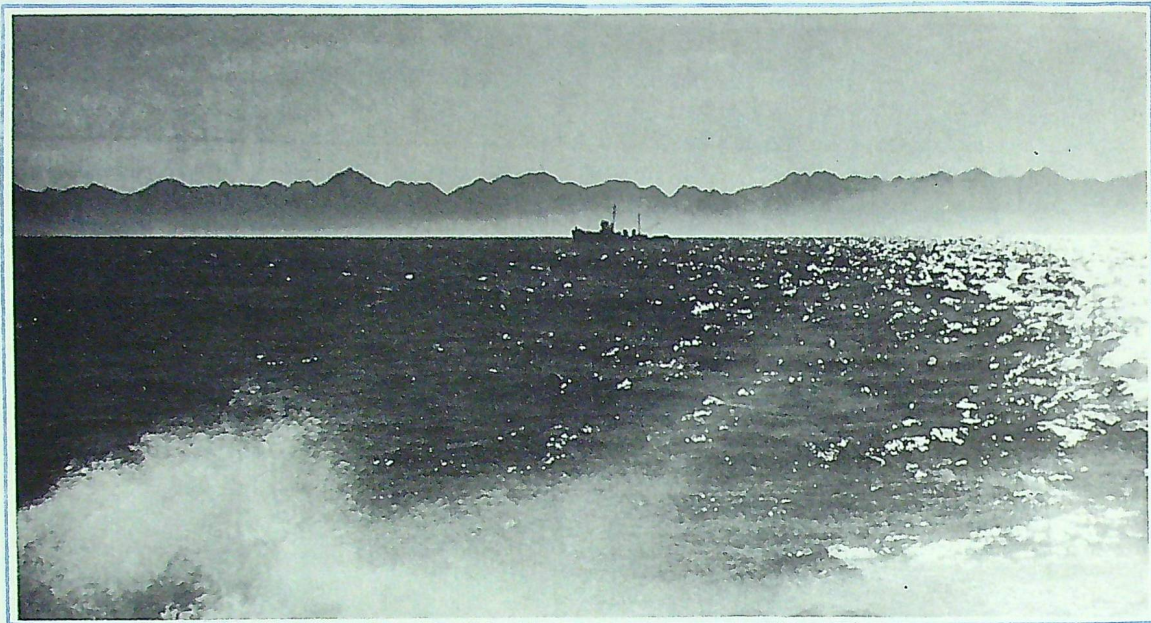
Sunset, Ferrer Point. This sombre view will be heart-breakingly familiar to many an ex-radar man who put in a lonely six-month stretch at this desolate spot twenty miles south of Zeballos. All mail and supplies—and the tons of equipment for the station itself—had to come around the West Coast, be landed through rough surf, moved over corduroy and plank roads, and finally hauled up a 500-foot cable-car railway to the highest point.



*Hauling up the anchor in the icy dawn, preparatory to starting on the 220-mile run from Ferrer Point to Bella Bella.*



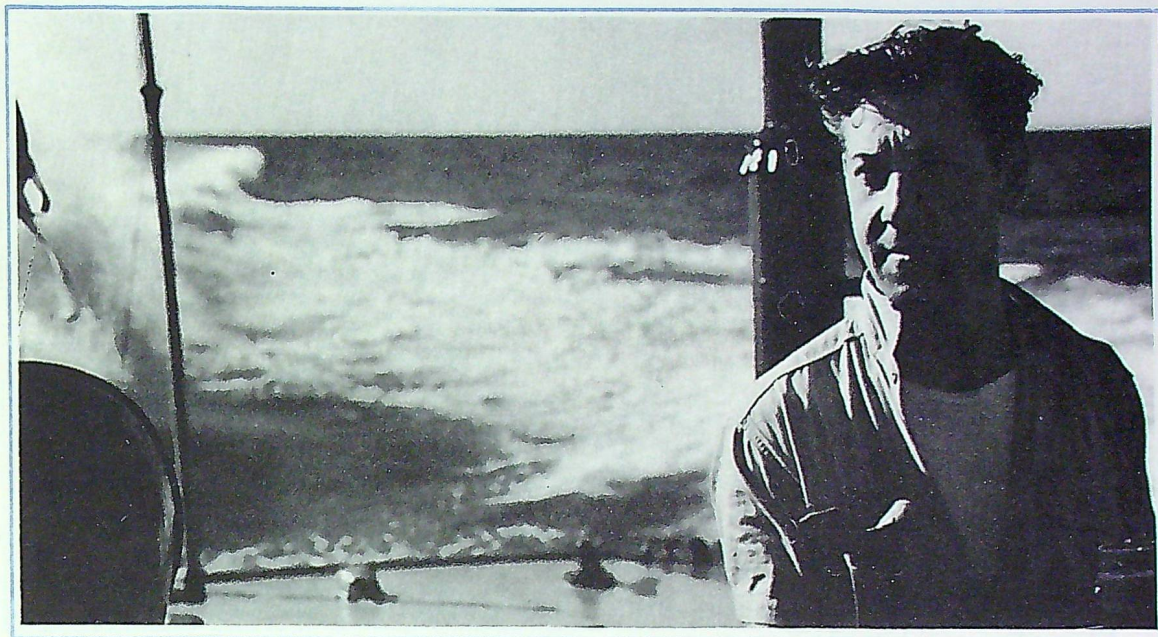
*The Squadron O.C., Flt. Lt. Bob Beer, watches a big one go by.*



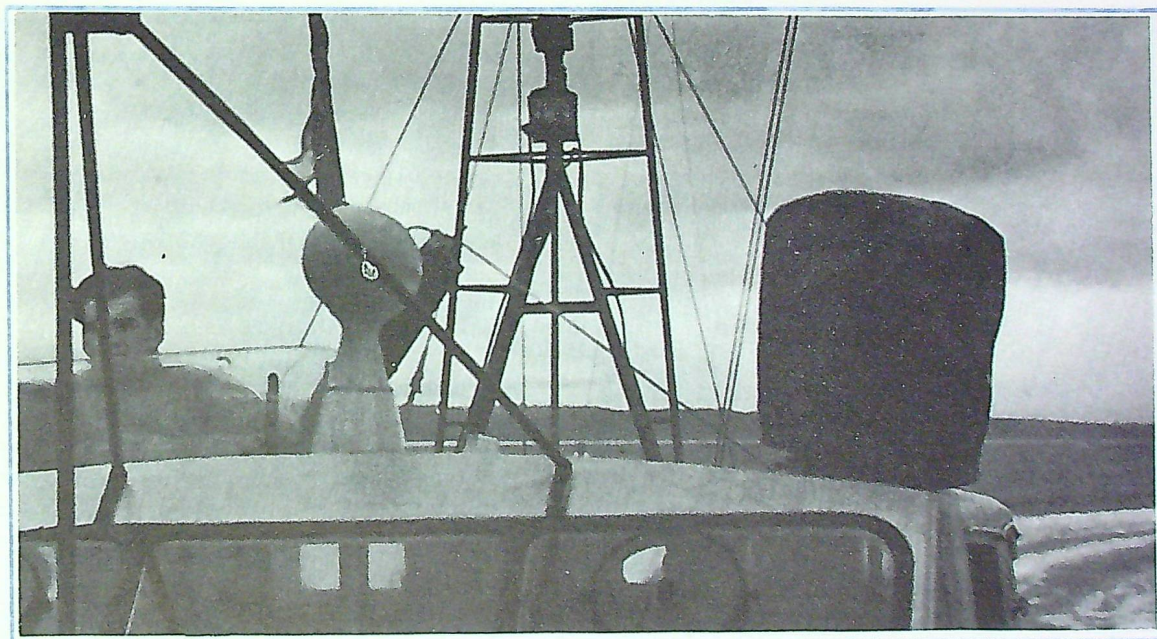
*Off Quatsino Sound, against a rocky backdrop of inhospitable coastline, one of Western Whaling Corporation's vessels takes advantage of a low morning sun.*



*Guided solely by her radar, the "Huron" rounded Cape Scott in a fog that cut visibility to 200 yards. Then, as Cape Calvert loomed on the radar scope, the fog lifted and revealed the rare sight shown in this photograph—a sulphur-bottom whale, of about 60 tons, amusing himself by turning ponderous somersaults.*

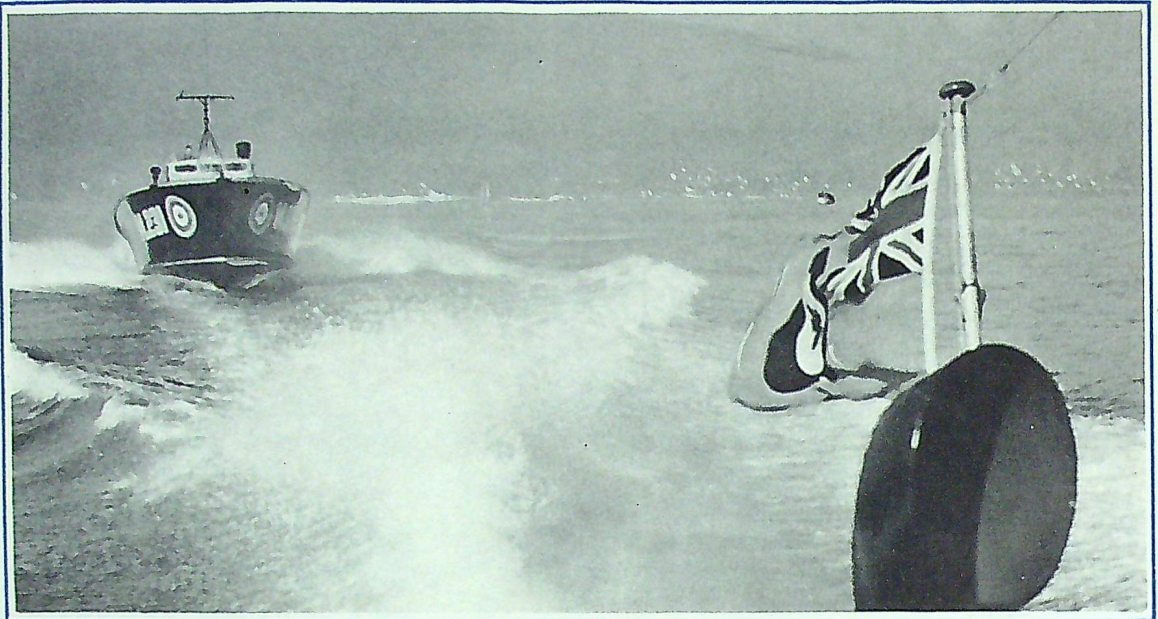


*2nd Engineer LAC Johnny Stad, looking at the rocky and surf-battered shoreline, reflects how nice it is to have two engines and a dory.*



*With ugly and lowering clouds above him, the look-out keeps watch on the flying bridge. Driftwood—even small stuff—can hole the hull or “prang” a propeller. So dangerous is it that the crew rarely sleep or relax during their “watch below.” All hands off watch (including the cook) are looking ahead. The menace of driftwood is one of the things even radar can’t remove.*

# The Roundel



*The "Malecite," having come out to greet her returning sister, follows her back into Patricia Bay. The "Huron's" running-time, to cover 900 miles, was 37 hours 7 minutes.*



*Just in order to prevent any jealousy in the family, Flt. Sgt. Moodie has asked us to publish the third sister's photograph. So here she is— The "Takuli"—as she left Patricia Bay for Halifax, via the Panama Canal.*

# A Bleat From BULLDOZIA

(Reprinted by courtesy of "Air Clues")

(In "The Third Accurasian Affair," which was reprinted in "The Roundel" last month, reference was made to Micawberwic's letter to "Air Clues." Here it is.—Editor)

*An extraordinary communication is reproduced below: extraordinary in its conception and extraordinary in the manner of its expression. But then it comes from an extraordinary individual of an equally extraordinary State. What roundabout or subterranean channels the missive passed through before it finally came into our hands is far from clear; though Bulldozia is noted for its uncommon flair for doing things in a roundabout fashion. We gladly give the letter publicity to ventilate what its author obviously regards as a grievous wrong.*

AIR WORKS, C.S.P.

PRUNEWAY, W.C., BULLDOZIA.

Ref.:—AW/XYZ/DO/C.S.P.

YOUR EXCELLENCY GROUP CAPTAIN,

I have with honour read your esteemed account of *The First Accurasian Affair* but beg you to withdraw the slur you have made on my ancient name of good father and mother. I am the Chief Supreme Plumber of Bulldozia, and you say that my gunsights were wrong when we went to war with Accurasia.

2. Somebody had to suffer for our failure to win the war, and, because of your statement, my men have been disgraced. I myself aligned the gunsights on the tips of the shadows of the telegraph

poles—what could be more accurate? Those telegraph poles just cannot move. I have been sentenced to be shot, but since our sights have proved to be inaccurate, and an innocent civilian may have been injured, my sentence was increased to life imprisonment.

3. You shall know the truth how we lost the war. Thrice-cursed Accurasian black magic! Yes, it was you yourself admitted it, even if you did call it "weapon planning." How can it be known if a man is going to miss or hit until he has fired the rocket? That is not all. My very good friend Dan, who has an important sanitary job at the Accurasian Ministry, has shown me a book which



they got from the British Air Ministry (A.P. 3152). It cannot be honest that a man should be able to decree what the weather will be, how many aeroplanes will be serviceable, how long the men will work, and suchlike. I, Micawberwic, can tell you no such thing is possible.

4. Many men, they tried to get to take my place, but none could do it. Pronto! I come back. The Crown Prince, he say:

"Micawberwicz, you are the only man we can find who will be responsible for servicing our aeroplanes."

Such an honour it was—only me in the whole country who could look after those aeroplanes! This time I use every new broom. I tried all the Accurasian secrets; but they don't work, maybe because I don't know magic. First, I give Spannavoik—he is my assistant—the book on British flying and servicing methods and tell him to use it. Me! No, I don't read it; I just look at the pictures. I have no time for such foolishness.

Spannavoik comes to me and says:

"Hey, Chiefty, don't you want me to do your penny poolantas no more?"

"Of course," I tell him. "Yes." And then he say:

"These Accurasian dogs give a man stripes, but still expect him to work on aeroplanes."

I tell him not to worry but to give the book to the mechanics. First, they like it; then they grumble and even ask for ladders—as if a packing-case

all the aeroplanes. That morning a proud man I was: one aeroplane he could have, and more, if only I could get some spares; four wanted a tyre each, two more wanted engines, another a port wing, and yet another a starboard wing. I read some of the pages of the paper and you will laugh as I did. Here is some stuff:

"The probability of equipment failure is proportional to the amount of equipment in use. The maximum number of exercises should be performed with the minimum number of aircraft which should be kept airborne for the longest practical sorties."

Foolishness! If I had plenty of aircraft I would be angry with the Count if he did not fly them all. I like to see them in the air, it makes me feel good; besides, if there is no flying it is always whispered: "Micawberwicz has no aeroplanes."

6. Some more—it says:

"Where a regular and constant output of flying hours is required the plan should be based on the output possible during the most adverse combination of factors likely to be experienced. For example, the average winter necessitates putting twice the number of aircraft in the air to achieve the same flying output possible in the summer months."

Now, isn't that stupid? Who would want to fly in winter? Anyway, I could not supply twice the number of aircraft in winter, because my men can then only work about three-quarters as hard as they do in summer.



is not good enough. They even ask for many more things. Later, they stop asking: they find the book's methods have washed out overtime.

5. One morning Count Weltwistle comes into my office. He throws at me the latest Accurasian Staff Paper and says I am to read it while he flies



7. Here is yet more:

"There is an optimum output from aircraft, aircrew, groundcrew, instructors, pupils, etc.; the efforts from each should be balanced. If they are not balanced, output will decrease and wastage increase. An illustration: if 20 armourers, instead of the necessary 30, are provided in a total of 300 groundcrew to produce 600 flying hours using 21 aircraft, then the output will be only 400 hours and the wastage will be 100 men plus 7 aircraft."

8. You laugh, yes? So do I, because I have only half the number of armourers I require; but those I have I just whip a bit, promise them a 48-hour leave, and, pronto! they work twice as hard. Which reminds me, I must find out why the last armourer didn't "sign on."

9. So then, Count Weltwistle comes back and asks if I like the paper. He tells me it does not fool him because he knows it's in code. The idea is to reverse everything and we would then have a picture of our glorious Bulldozian Air Force.

10. I trust, dear Group Captain, that I have shown you what an injury you have done to such a conscientious man, and would welcome you to visit our magnificent Air Force. Maybe if you are nice to Count Weltwistle he will let you fly our serviceable aeroplane very much.

Your very humble and obedient Servant,

P. D. MICAWBERWICZ,  
*Sgt., Acting Paid Ensign—Acting Unpaid Majordomo, Chief Supreme Plumber, Bulldozian Air Works.*

GROUP CAPTAIN E. S. D. DRURY, A.F.C.,

c/o "AIR CLUES,"

BRITISH AIR MINISTRY,  
LONDON, ENG.



## OUR INTERPLANETARY FUTURE

AERONAUTICAL PEOPLE might well take a leaf out of the book of the British Interplanetary Society, which once a year, at the start of its lecture season, turns aside from technical preoccupations and pauses to consider where it is going and what it is letting the human race in for.

Dr. Olaf Stapledon, lecturing recently to the Society on "Interplanetary Man," warned them how dangerous "expertism" can be if accompanied by misinformation in other fields. Interplanetary flights, he said, will not come if our species destroys itself with atomic power before achieving unity; on the other hand, a unified human race could use the tremendous possibilities of atomic energy to alter conditions on the planets so as to make them habitable. Alternatively, progress in biological science might enable us to produce a modified human species adapted to life on other Worlds.

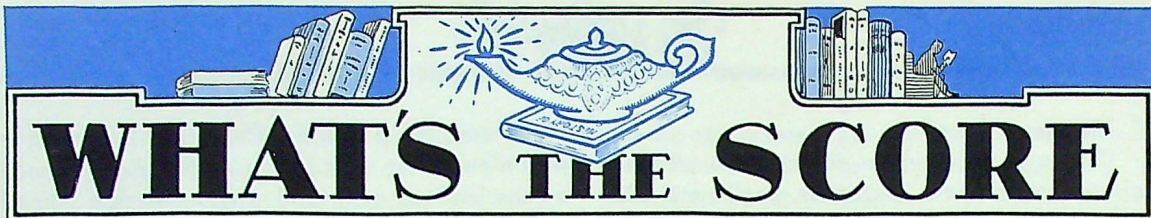
(Courtesy of "The Aeroplane")

Warning against grandiose schemes for using atomic energy was given by a chemist in the audience, who declared that there is not even enough uranium and thorium available to destroy the human race, and it would take one atomic bomb per day merely to keep the World's population stationary.

In the unlikely event of our contacting another intelligent species elsewhere in the universe, Dr. Stapledon opined that human thought would have to develop well beyond present-day standards if we were to co-operate with them instead of trying to conquer them. This led one lady member to demand a strict psychological selection of people allowed to go on inter-planetary voyages; in fact, she would not trust more than 25 per cent of the Society's membership with the task. But, as Dr. Stapledon asked, who would select the selectors?

—A.E.S.

(Dr. Olaf Stapledon some years ago wrote one of the most fascinating books of all time: "Last and First Men." In it he "traces" the history of man from the present day until his final extinction on the planet Jupiter, where he has sought refuge from the deadly rays of the dying sun.—Editor)



# WHAT'S THE SCORE

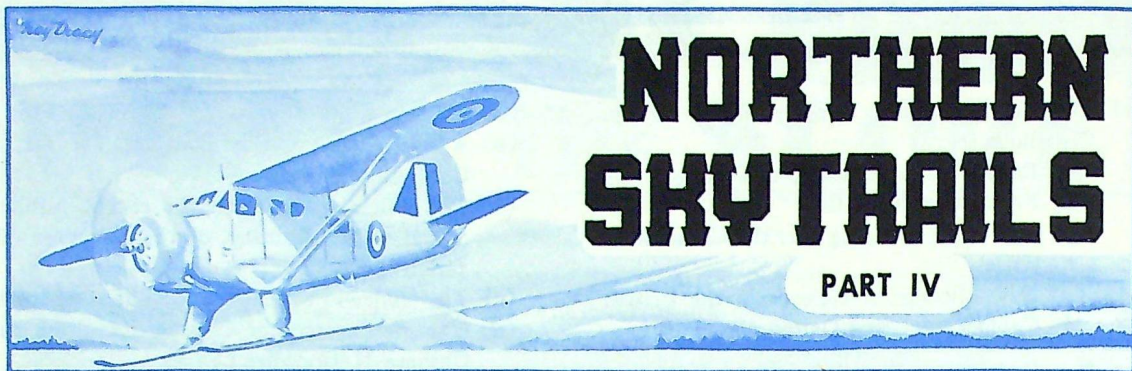
(Answers are given on page 48)

Attached to this month's manuscript of "What's the Score?" was a memorandum from the Educational Branch. The following is a brief quotation from it: "Surely by now we've brought everyone at least up to the standard required for a Ph. D. Isn't it about time you got a little help from some of these intellectual giants?" So there it is. If you like these questionnaires, you'd better start sending in the odd question (with the right answer indicated). The twenty best questions, selected each month from all those received, will be published in "The Roundel," with acknowledgements to every contributor.—Editor.

1. Alger Hiss has figured prominently in the newspapers lately. He is:—
  - (a) The communist leader in the Soviet Sector of Berlin
  - (b) The author of a controversial history of U.S. participation in the late war
  - (c) The U.S. citizen indicted in the U.S. for communist activities
  - (d) The Austrian physician who is reported to have witnessed the death of Hitler
2. Which of the following received most Marshall aid in 1948?
  - (a) The Benelux countries
  - (b) Western Germany
  - (c) Austria
  - (d) Italy
3. The "Banana Republic" is a term humorously used for:—
  - (a) Nicaragua
  - (b) Panama
  - (c) Peru
  - (d) Chile
4. The capital of China is:—
  - (a) Peiping
  - (b) Chunking
  - (c) Soochow
  - (d) Nanking
5. A new Mufti of Jerusalem was appointed in December 1948. The term "Mufti" means:—
  - (a) A mayor
  - (b) A descendant of Allah
  - (c) A military ruler
  - (d) An expounder of Moslem Law
6. The U.N. are still concerned with the question of Kashmir. Kashmir is in:—
  - (a) Afghanistan
  - (b) Northern India
  - (c) Indo-China
  - (d) Turkey
7. The most powerful propeller-driven plane, the B-B6-B, has:—
  - (a) Four engines
  - (b) Eight engines
  - (c) Six engines
  - (d) Ten engines
8. Tegel has figured very prominently in the news lately. Tegel is:—
  - (a) A mountain ridge in Palestine
  - (b) An airport in Berlin
  - (c) A new radar interception system
  - (d) The new light alloy for making bridges
9. UNESCO may be defined as:—
  - (a) A body devoted to the welfare and care of displaced persons in Europe
  - (b) A United Nations group devoted to the study of scientific defence developments
  - (c) A United Nations organization devoted to cultural development throughout the world
  - (d) A body formed to combat communism
10. The Lipari Islands figured in World War II. Where are they?
  - (a) Off the coast of Iceland
  - (b) Off the southern tip of Italy
  - (c) Near the Marshall Islands
  - (d) Off the coast of Argentina

11. Costello has gained some publicity lately. Costello is the:—
- Roman Catholic Bishop of Chicago
  - Prime Minister of Eire
  - U.S. judge presiding over the Communist trials
  - New Minister of Defence in the British Cabinet, replacing Dalton
12. Bauxite is:—
- The ore used in making aluminum
  - A non-combustible substance used in the manufacture of gasoline tanks
  - A light alloy used in manufacturing aircraft wings
  - A form of lint used in dressing excessive burns
13. During the absence of the Governor-General from Canada, who exercises his powers?
- The Prime Minister
  - The Under Secretary of State
  - The Chief Justice of Canada
  - The Leader of the Senate
14. The immediate cause of the Second World War was:—
- The German determination to absorb Danzig
  - The remilitarization of the Rhineland
  - The annexation of Austria
  - The occupation of Czechoslovakia
15. The word Canada is believed to have been derived from an Indian word "Canata," meaning:—
- A collection of huts
  - Land of snow
  - Land of forests and lakes
  - Home of the Great Manitou
16. In the Vandenberg Resolution:—
- The exact limits of the zones of occupation of the Allies in Germany were determined
  - The Western Nations refused to grant ERP aid to Yugoslavia and Albania
  - The lines of succession, should a president die during his term of office, were for the first time defined exactly
  - The U.S.A. declared its intention to lend military aid to other countries
17. Sun Yat-Sen was:—
- A Chinese philosopher, contemporary with Confucius
  - The official title, until the recent public denial of his divinity, of the Emperor of Japan
  - The leader of the Boxer Rebellion of 1900
  - The predecessor of Chiang Kai-Shek as Chinese Nationalist Leader
18. A somnambulist is a person who:—
- Is addicted to violent nightmares
  - Suffers from insomnia
  - Walks in his sleep
  - Is unable to remain awake
19. With respect to Palestine, Canada:—
- Has given recognition to the state of Israel
  - Has refrained from giving recognition either to the Arabs or the Jews
  - Has furnished military aid to both sides
  - Is refraining from any action pending a full debate on the question at the next session of parliament
20. With respect to the United Nations, Ireland:—
- Has been denied membership through veto of its application by the Soviet Union
  - Does not desire participation, feeling economically unable to make any contribution
  - Feels that it would be of more benefit to remain neutral in world affairs
  - Has not been invited by the U.N. General Assembly to be a member, nor has she filed an application





By Flt. Lt. E. P. Wood, D.F.C.

### The R.C.A.F. in the Sub-Arctic: 1927 to 1939 (Cont'd)

#### No. 3 General Purpose Detachment

ON JULY 1ST, 1931, two Bellanca Pacemaker seaplanes arrived at Fort Churchill for the purpose of carrying out photographic operations on the west coast of Hudson Bay and the lakes and inland waterways in an area bounded roughly by Maguse Lake, Kaminuriak Lake, Rankin Inlet, and Hudson Bay. With them came their crews: Flt. Lt. A. F. ("Sandy") MacDonald, O.C. of the Detachment; F/O P. B. Cox, pilot; Cpl. Lunney, rigger; LAC Green, fitter and camera operator; LAC Harvey, fitter and camera operator; and A. R. MacPherson, civilian cook.

As soon as ice conditions permitted, the Detachment flew North and landed at Mistake Bay, N.W.T., and a base was established on July 21st at Tavani in an abandoned fur-trading post. The Detachment was accompanied by a party of Land Surveyors.

The right angle oblique method of air photography employed by the Detachment was a new experiment. Hence little or no previous data was available with regard either to camera or flying technique. (The Detachment had devised its own camera mounts and worked out the required geometry while waiting at Fort Churchill for the ice to clear out of the Bay). None the less, excellent results were achieved, and by the time the operation was complete, numerous errors had been discovered in the existing Marine Mercator's Chart of Hudson Bay. In all, about 1200 photographic miles were flown.

Flying was done at an altitude of 5000 feet A.S.L., following the shorelines of lakes and rivers at a distance of half a mile from the near shore. In addition to aerial photography, the Detachment did the usual assortment of odd jobs which always fall to the lot of anyone with an aeroplane in such regions. A substantial tonnage of freight was flown from Baker Lake to establish a new post at Beverley Lake for the North West Territories Department. The Detachment's arrival at Baker Lake was coincidental with that of Col. Lindbergh on his historic flight across the Barren Lands to Japan in a long-range Lockheed Sirius.

Weather conditions encountered were anything but pleasant for contact flying. Visibility below safe V.F.R. limits was all too frequent. Fog banks had an unpredictable habit of rolling in and blanketing the coastline with little or no warning. The Detachment aircraft were not radio-equipped, and in those days no radio navigation aids existed in the Territories. Under conditions of lowered visibility navigation was fairly difficult, since the magnetic compass was quite useless. Generally the pilot had to rely on sun diagrams—which were, of course, of no help when the sun was obscured. Navigation was for the most part a matter of map-reading from the somewhat vague maps available and reliance on that "sixth sense" with which Providence seems to have endowed children, alcoholics, and certain pilots.

None the less, the operation proceeded on the whole according to schedule and without any serious mishaps. Only two minor incidents (both of them on the humorous side) deserve mentioning here.

The first occurred on July 31st, when the Detachment arrived back at Tavani from an operation further down the coast to learn that one of the survey parties was a week overdue in arriving from the Barren Lands. With Eskimo observers in the plane, a two-day search was undertaken—and rendered none the pleasanter by numerous forced landings on glassy water caused by overheating of the Wright J6 engines, which had not been fitted with oil coolers. Then, when the survey party was finally located, its members were highly insulted by the fact that anyone had so much as dared to consider them lost!



The second incident was the forced landing of F/O Cox on August 3rd. While he was returning from a photographic flight, his engine began to lose power slowly and finally died completely. Thorough investigation revealed no indication whatsoever as to the cause of the failure, and F/O Cox's experience remained one of the unexplained mysteries of the North. It is more than probable, though, that a better understanding of what is now known about carburettor icing would have set at rest the baffled minds of the entire Detachment.

The Detachment was constantly reminded of the need for unremitting care. The Barren Lands afford little shelter, and winds of up to seventy miles per hour are not uncommon. The year previous to the Detachment's operation, a number of aircraft had been used by the mining exploration companies in the same area, and the wrecks of many of them were observed along the coast. Rumour had it that one aircraft had actually been lifted clean off the water in a gale and carried seven miles inland.

On August 5th, the Detachment flew the first official airmail flight from Chesterfield Inlet to Fort Churchill. The mail load included cachets forwarded for this specially authorized flight from almost every corner of the globe.

The photographic operation was completed on September 3rd, and two days later the Detachment flew down to Fort Churchill on its way to further work at Riding Mountain, Manitoba.

### **Air Commodore R. C. Gordon, C.B.E.**

"My first experience with northern flying," writes Air Commodore Gordon, "was at Cormorant Lake, from May until November 1932. During this period I was the officer commanding the Base, and the only pilot based there. I had under my command approximately twenty-five other ranks, engaged in servicing and repairing aircraft.

"In 1932, the Base at Cormorant Lake was used entirely as a servicing point for R.C.A.F. photographic and transport aircraft en route to the western Arctic, and as a repair depot for aircraft that could not be handled at Winnipeg. The Base itself consisted of one hangar with full repair shop facilities, slipway, messing and barracks accommodation. It was self-contained, with electric light and fire-fighting equipment, and supplies were brought in from The Pas or purchased in the small town of Cormorant about one mile distant.

"I found my job very interesting but somewhat lacking in excitement. Indeed, my one operation that year worthy of special description was the operation referred to as 'Cosmic', for which I was detailed to do the flying.

\* \* \*

"'Operation Cosmic' was conducted to ascertain what effect northern latitudes had on the Cosmic Ray, both on the ground and in the air. The experiments made were under the direction of Dr. Milliken of the University of Southern California.

"To carry out this operation the RCAF supplied a single-engined supercharged Fairchild aircraft fitted with floats. The operation was to consist of one flight of one hour and fifteen minutes at an altitude of approximately 18,000 feet, to be immediately followed by another hour and fifteen

minutes at as high an altitude as could be obtained with the aircraft in question. No oxygen equipment was supplied for the operation and, on contacting the Commanding Officer of Winnipeg Air Station in connection with this matter, a reply was received to 'chew gum and swallow frequently'. To accustom me to flying at high altitudes without oxygen, practice flights were authorized for approximately ten hours in the air. Shortly after these trial flights were completed, Dr. Milliken arrived at Cormorant with his experimental gear. The equipment was automatically operated and required no maintenance in the air, so that the aircraft carried only myself and LAC Fortey, the engine mechanic.

"The morning after the instruments had been installed in the aircraft, I took off in CAVU weather with a westerly wind. I climbed the aircraft over the Base to an indicated height of 18,000 feet and flew on a westerly course of 270°.

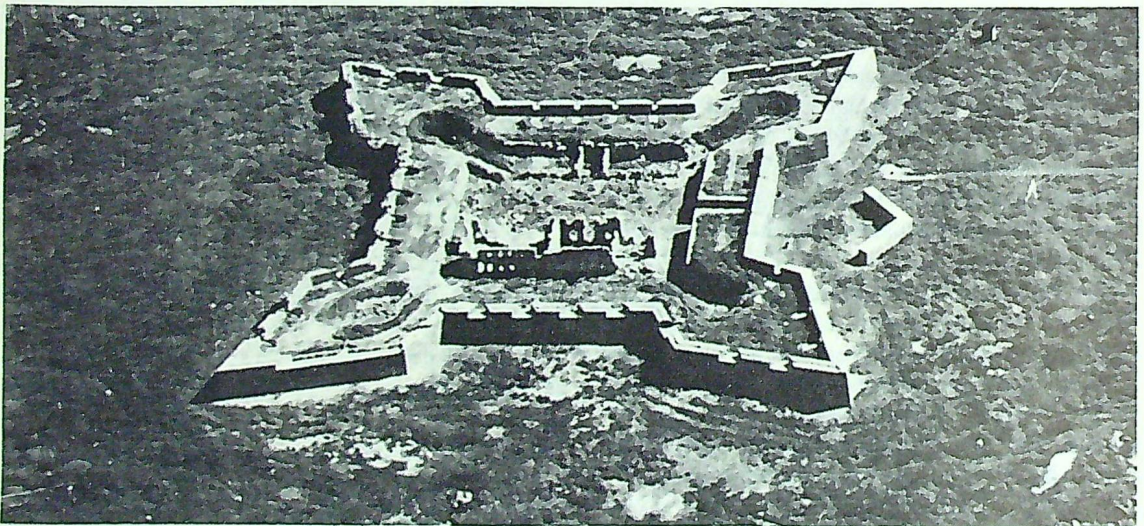
"The above course was held until the hour and fifteen minutes had elapsed, and the aircraft was then climbed to an indicated altitude of 23,000 feet and placed on the reciprocal course. After about forty minutes LAC Fortey became ill and

lay down on the floor, and about twenty minutes later I was seized with a severe headache which lasted until the following morning.

"The aircraft was flown on this course for the remainder of the hour and fifteen minutes specified, then throttled back for the descent. By this time a solid overcast had formed at about 10,000 feet and no opportunity had been obtained to check landmarks. On breaking out of the overcast at about 6,000 feet I attempted to locate our position, but without success.

"The terrain was unfamiliar and apparently uninhabited. Gasoline was running low and, as I was suffering considerable physical discomfort from the high altitude at which we had been flying, I decided to make a landing to conserve fuel. Having selected a lake, I was going in on my final approach when I sighted a settlement on an adjoining lake.

"This proved to be Oxford House Post on Oxford Lake. It was a bit of a shock to find myself so far east of my own Base, but on going over the flight logs that evening I realized that a strong wind of approximately 60 miles per hour had been blowing at the altitude at which we had been



*Old fort at Churchill*



flying. Since our flight had been above clouds, we had not been able to check the wind.

"The aircraft was refuelled from the RCAF gasoline cache at Oxford House, moored for the night, and flown back to Cormorant Lake the following day. There I learned that a search was already under way by aircraft that were returning to Winnipeg from the Great Bear Lake district."

\* \* \*

During the summer season of 1934 Gordon commanded an RCAF Photographic Detachment. His description of this type of Detachment and its normal work fifteen years ago is not without interest in these later days.

"A typical RCAF photographic Detachment in 1934-35 consisted of two aircraft, two pilots, two camera operators/aircraft mechanics, and a fifth man who, in the ordinary course of events, remained at the Base to assist in servicing the aircraft and cooking for the Detachment. At that time the aircraft provided were Bellanca single-engined float planes.

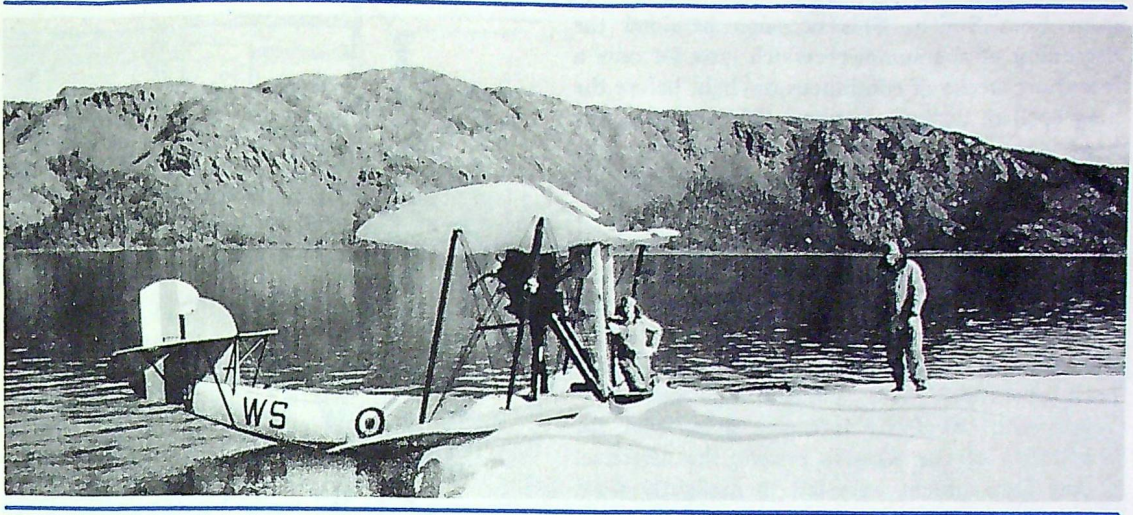
"The established procedure was for the Detachment to commence work in the southern areas as

soon as snow and ice had disappeared and, as the season advanced, move to the more northerly areas. This procedure was reversed in the fall of the year. No radio facilities were provided in the aircraft, nor, in remote locations, were they available even at the Base. This circumstance made it essential that each Detachment must operate two aircraft to guard against unserviceability, to be sure of flying out of remote locations, to communicate with Headquarters, and to supply food for the Detachment. Contact with Headquarters had to be established at least once every two weeks.

"In addition to its Service personnel, a Detachment normally had a Topographical Survey representative allotted to it for the season by the Department of the Interior. The main work of this individual was to establish control points (by astronomical observations throughout the area to be photographed) to form a basis for the plotting of the photographs taken. To enable this representative to do his job, the Detachment provided aerial transportation, assisted him in setting up his camp, and provided food for his requirements. The men supplied by the Department for

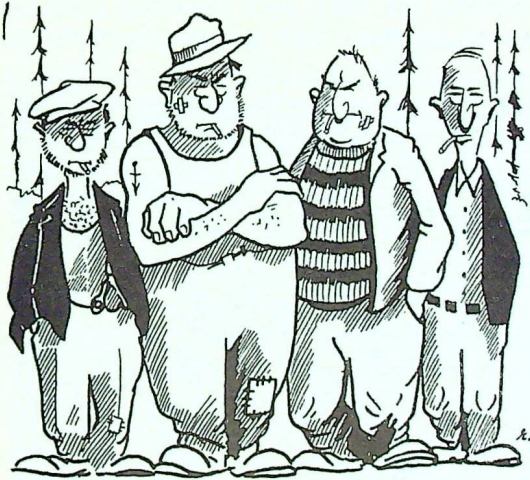


*Among the Mackenzie Mountains*



*Vedette at Glacier on East Side of Great Bear Lake.*

this type of work were rugged individuals. They enjoyed their work, seemed to have a great capacity for living among mosquitoes, and ate and slept comparatively little.



"The Detachments were self-contained units. The Commander was completely responsible for his Detachment—its operations, its food (which in the N.W.T., had to be ordered in March to ensure that it would be available for pick-up at Waterways in June), its fuel, its equipment and personnel. In addition he functioned as an Accounts Officer."

Gordon's northern operations during the years 1934 and 1935 were conducted in the following regions:

- God's Lake, the area between Great Slave Lake and Lake Athabaska,
- Slemon Lake (named after Flt. Lieut.—now A/V/M—C. R. Slemon, who established a gasoline cache there in 1927),
- Cree Lake, and
- Aklavik.

His account of the early part of the year's work includes two incidents of the type which were almost routine experiences in those days. On the first occasion, after being forced down by engine trouble, he and his crew had to spend three days in the pouring rain on a diet of ship's biscuit and whatever fish they could catch. On the second, a non-existent gasoline cache which was marked on their vague map almost led to disaster.

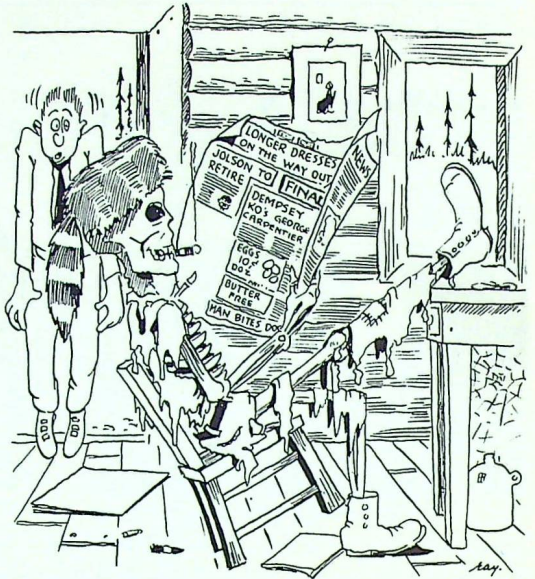
Speaking of the operations in the Aklavik region, he writes:

"Aklavik is located on the Delta at the mouth of the MacKenzie River and is the main centre of trading activity for the western Arctic. The terrain is flat and marshy with a small amount of timber growth. In 1935, the settlement consisted of approximately fifty whites. It was particularly active on the arrival of the first boat of the year

from Fort Smith. This occasion heralded the beginning of the summer—which lasts for only a few short weeks of continuous daylight before the long spell of darkness returns. The arrival of the boat is a great occasion for the Eskimos, who swarm in with their schooners to obtain supplies for their summer operations.

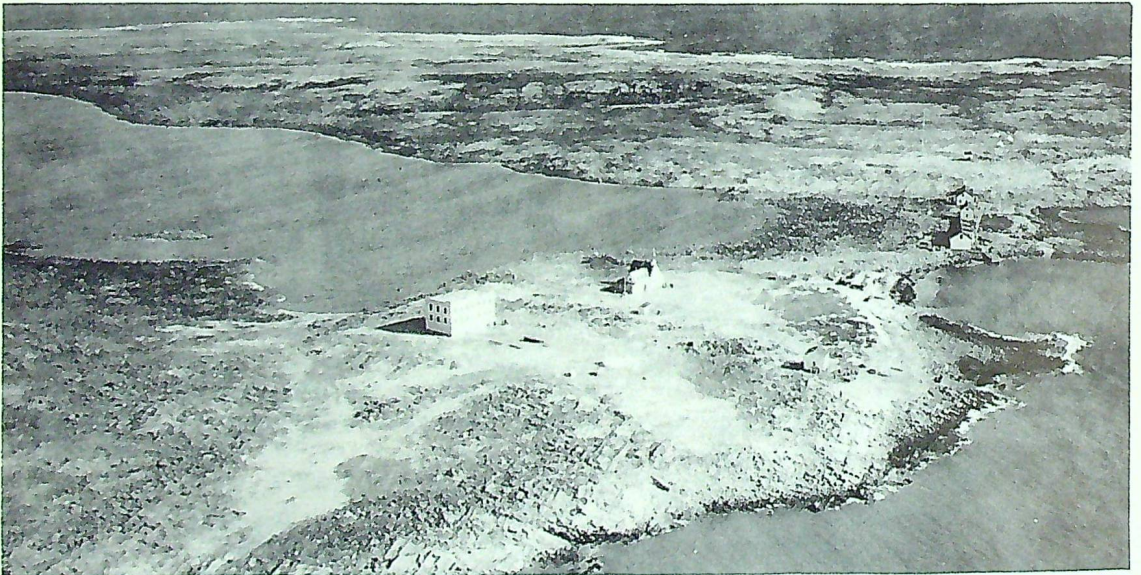
“Two photographic operations were carried out from Aklavik. One was over the Reindeer Reserve north of Aklavik, and the other was across the Richardson and MacKenzie mountains to the Porcupine River. The weather was perfect, and both operations were completed in four days. What with the fairly intensive flying and the hospitality of the Aklavik people, the personnel of the Detachment were left in a slightly worn condition.

“During a transportation flight in the Reindeer Reserve, I landed on a lake, and, while establishing camp, my crewman discovered an old abandoned cabin a short distance up the shore. This cabin was scarcely more than a hole in the tundra, surmounted by a wooden framework and covered by a badly weathered tarpaulin. Inside we found a human skeleton and portions of an old sporting



magazine. No identification was ever established, either on the spot or through the R.C.M.P. at Aklavik.

“The trip across the Richardson and MacKenzie mountains was much more interesting than the monotonous flying over the Reindeer Reserve.



Chesterfield Inlet



*Lac du Bonnet*

After following the Rat River, we proceeded down the Bell River to the Porcupine. This route passes through rugged country with mountain peaks rising to a height of 8000 feet. This is the area in which the mad trapper, Johnston, had been eventually located and killed some years previously. From the air we could see the buildings of

of La Père House, an old abandoned trading-post that had served as headquarters for the search. It was also along this route that an entire detachment of R.C.M.P. perished in the middle of winter in 1911 on a trip across the pass from Dawson City to MacPherson."

*(To be continued).*



## PUSH-BUTTON WARFARE

*(Reprinted by courtesy of "The Aeroplane")*

C. G. Grey discusses at some length the Report of Air Chief Marshal Sir Roderic Hill on the German attack on Southern England with flying bombs and rockets. C.G.G.'s comments should do much to help people see the menace of the guided weapon in its proper perspective.

At the conclusion of the article is a table compiled from the Report showing how much greater the menace was from the V-1 than the V-2—quite apart from the menacing, throbbing, blowpipe-like roar of the former's power unit. In spite of the fact that the Defence knocked down 50 per cent of the V-1's launched, 30 per cent got through. Of the rockets, against which no defensive action could be taken once they had been launched, only 25 per cent arrived in the target area as against the 80 per cent of V-1's which would have arrived in the same conditions. Add to this the fact that the V-1 took some 400 man-hours to build as against, say, 20,000 for the V-2 rocket and it is obvious which of these two weapons with similar range was the most effective.



The



# SOVIET AIR FORCE

## PART FOUR

By "Polygon"

(Reprinted by courtesy of "The Aeroplane")

### Aircraft Engines

I REMEMBER THAT, during the "Kaiser" war, German engineers concentrated on the gradual development and improvement of a series of simple six-cylinder engines. During the "Hitler" war we ourselves adopted a similar policy, for the majority of our war-time engines consisted of two types only, the air-cooled sleeve-valve radial and the liquid cooled 12-cylinder V engine. As the War went on, these types were gradually improved and developed to give more and more power. The Russians adopted a similar policy, for they knew that an engine takes longer to develop than does an aeroplane.

In 1939 the Soviets had the licence for building the Wright cyclone, the Gnome-Rhône, the Hispano and the BMW. Very wisely they decided to develop these well-proved engines rather than evolve a new design. By 1944 production had been concentrated on four types of air-cooled engines and three types of liquid-cooled engines. The air-cooled types were:—M 88 B of 1,100 b.h.p. used for bombers; M 82 of 1,700 b.h.p. used for both fighters and bombers; M 62 IR of 1,000 b.h.p. for transport aircraft; and M 11 of 145 b.h.p. for trainers.

The liquid-cooled types were:—M 105 PF of 1,200 b.h.p. for fighters and bombers; M 107 of 1,600 b.h.p. for fighters; and AM 38 of 1,700 b.h.p. for ground-attack aircraft.

Brief particulars of the AM 38 type (a 12-cylinder V engine derived from the BMW VI are

as follow:—Bore, 160 mm.; stroke, 190 mm.; swept volume, 46.6 litres; compression ratio, 6.8:1; reduction gear, 1.36:1; supercharger ratio (single-speed), 11.05:1; fuel, 95 octane; take-off power, 1,600 b.h.p.; max. r.p.m., 2,150; and dry weight, 1,890 lb.

A typical air-cooled type was the M 82 (a 14-cylinder radial engine derived from the Wright Cyclone), details of which are:—Bore, 155 mm.; stroke, 155 mm.; swept volume, 41.2 litres; compression ratio, 7:1; reduction gear, 1.45:1; super-charger ratio (two-speed), 7.14:1 and 10:1; take-off power, 1,700 b.h.p.; and dry weight, 1,950 lb.

Although the types listed formed the mainstay of the S.A.F., experimental work was done on new and original designs. At least two new liquid-cooled types were under development, one having 18 cylinders arranged in three blocks, and another having 36 cylinders arranged in six blocks; air-cooled radials of 18 cylinders were also under development. It is more than probable that a good deal of work was done on jet power units, although these did not appear on the front. Total production of engines during the War probably exceeded 275,000.

### Armament

When one looks back, the "Hitler" War was remarkable for the fact that throughout the contest the R.A.F. and the British Army fought with machine-guns of foreign design. We pride ourselves that we are the finest internal combustion engineers in the World and a machine-gun, after all, is nothing but an internal combustion engine of very high power and extremely light

weight; yet we had no machine-gun of our own design. The reason may be traced to the fact that, up to 1935, we had a pathetic faith in the League of Nations, and that a good machine-gun takes longer to design and develop than does an aero-engine. We knew we had not time to develop a good weapon and so adopted the Browning, the Hispano and the Bren. Even the Navy went foreign with the Oerlikon.

The Russians, on the other hand, although evolving their aero-engines from foreign designs, were entirely original in their design of machine-guns. What is even more remarkable is that the Russian guns were of a very high standard. They were reliable weapons and had a good rate of fire. The standard light and heavy machine-guns used in the S.A.F. were: 7.62-mm. SH-KAS with fixed or free installation; 12.7-mm. BERESIN with fixed or free installation; 20-mm. SH-VAK with fixed or free installation; 23-mm. V-JA with fixed installation, and 27-mm. N.S. with fixed installation.

Gun mountings generally were of a much lower standard than the weapons, and the S.A.F. had much to learn in the way of power-operated turrets. A study of the types of aircraft I have described shows that most had hand-operated guns, and generally the tactical aircraft were too small and light for the application of heavy power-

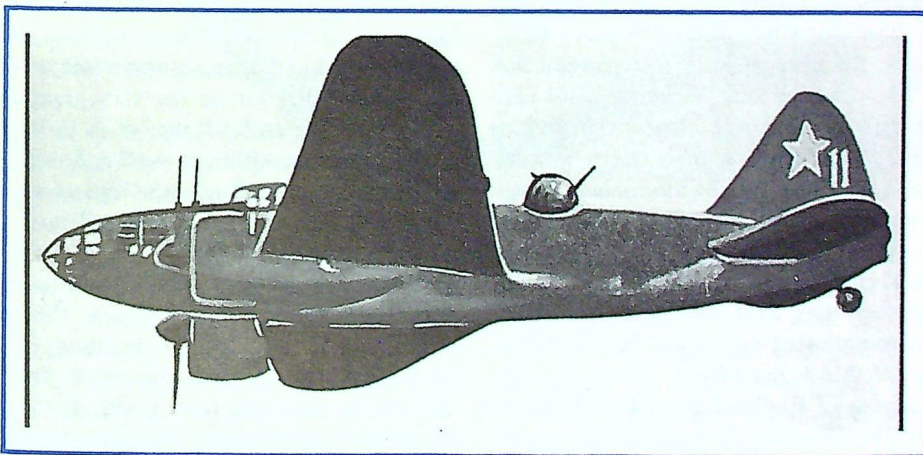
operated turrets.

Ammunition was of a poorer quality than our own and bombs were not as efficient. The main types were 110 lb., 220 lb., 1,100 lb., and 2,200 lb.; armour-piercing bombs were similar to our own S.A.P. Incendiaries were mainly 1 kg. and 2.5 kg. with thermite filling, and 10 kg. and 50 kg. filled with thermite and naphtha. Gun and bomb sights were considerably simpler than those used in the R.A.F., although a number of hand-operated semi-automatic bomb sights were in use. The Russians had devoted a good deal of research work to chemical warfare, and their standard of equipment was comparable with our own. Spray containers were designed to be fitted externally and operated with a high delivery rate. None, however, was used in the War.

The Russians were probably limited in their materials for ammunition, and the somewhat low standard of training precluded the use of complicated instruments. Their ability in gun design is the most remarkable feature of their armament side.

## Conclusion

This article on the Soviet Air Force has dealt entirely with the operations and equipment of the Russians during the War. We would all like to know something about the present-day con-



*OUTMODED.*—One of the standard medium bombers used by the Soviet Air Force during the War, the Ilyushin Il-4, previously and better known as the DB-3F, is now rapidly going out of service, though some are still used for training and general purpose duties.

stitution of the S.A.F., but the fabulous iron curtain seems to have clanged down on both information and friendship.

The facts I have outlined can give us a reasonably useful guide regarding present-day Soviet air power. Although we and the Americans have made great reductions in our air power, and in the monies granted to design and research, it is more than probable that the Soviets have done the opposite. Only complete fools would behave in the truculent manner of the Russian politicians if they were not backed by the most powerful armed forces. The conduct of the War, and the great achievements of the S.A.F. and its factories, show that the Russian leaders are not fools, at any rate in the military sense.

There are four main conclusions to be drawn from a study of the S.A.F. in war. The first is the very great importance the Russians attach to research and the great number of establishments they have set up for that purpose. The Soviets were very backward in air power at the start of the War, but they emerged with complete air superiority over the Germans. That progress is likely to have had a steady acceleration since 1945, and has been strengthened by a powerful influx of German scientific brains. It may be that the ideology and principles of these German scientists are in deadly opposition to Communism, but ideologies are apt to take second place when it is a case of sheer necessity to live. We may reasonably assume that the already powerful Russian research and development facilities have been expanded, and have, by now, done much work on jet engines, rocket motors, and guided missiles.

I will not speculate on the atom bomb except to point out that their own professors, aided by Germans, must be fully aware of the general principles of construction of this weapon. No one knows whether they have been able to build up great and complicated appliances needed for the production of this engine of war. It took the combined resources of England and America several years, but the Russians have got the resources, they have had the time, and they can experiment in secret.

The second conclusion we may draw is that we must no longer look on the Russians as a race of illiterate peasants but as a mechanized people with an ever-growing interest in things mechanical. The move of their great factories from the front line to the Urals and to Siberia was one of the greatest engineering feats the World has ever seen. That it was accomplished in so short a time and that aircraft design went on smoothly during this move is a mechanical miracle. I have pointed out that, generally speaking, the standard of their equipment in the way of aircraft and engines was inferior to that of the Germans and of ourselves. We must not forget that not until 1944 did they have time for research and new development and that their policy was devoted intentionally to quantity rather than quality. They have now had four years to make up leeway and we must not ignore the brilliance of their weapon designers.

The third conclusion is that great strides were made in S.A.F. training during the War. Their basic material in the way of personnel is good, with a natural aptitude for mechanical training. Their bravery is fantastic. A friend of mine was privileged to take some Hurricanes over to the Russians in the early days of the War and also joined in their operations. He told me some remarkable facts about the bravery, toughness and endurance of the Russian fighter pilot. Finally, we must not forget that the Russian does really believe his propaganda. He is allowed to know nothing else.

Lastly, and perhaps most important, we must give careful consideration to the very great flexibility which the Russian Staff showed in the conduct of their operations. Although the S.A.F. was virtually a huge Tactical Air Force, the leaders were always ready to learn from the enemy and to adapt their operations to the varying needs of war. While I think that their general policy still holds fast to the tactical principle, they have the men and material available for the building of a great strategical force. We do know that the Russian aircraft factories are now producing in quantity the Soviet version of the American Superfortress, and the fact may well indicate a change of attitude towards strategical bombing.

The whole World is now divided into two religious camps, and when I use the word "religious" I do so intentionally. The Russian people, except for some millions in concentration camps, are fanatically devoted to their new religion, which is the worship of the State, and the denial of individual freedom and liberty. The rest of the World is equally fanatical in its worship of freedom. Freedom to worship what we like, freedom to talk and write as we like, freedom to

criticize our Government, and freedom to laugh at our State officials.

History has shown that religions often cause bitter wars. Let us hope that history does not repeat itself. We have some reason to look with cynicism on the phrase "a war to end war". War with Russia might not end wars, but would most certainly end civilization.

End

## LAMENT FOR THE "TIGER"

PILOTS ALL OVER THE WORLD, flying all manner of aircraft, will lament the passing of the Tiger Moth, the most famous and widely used training machine of recent years. It is about to be superseded by a modern, all-metal monoplane, the Chipmunk. Whatever type of aircraft may now be in their charge, most pilots learned to fly on a Tiger Moth, and they remember it with gratitude and affection. It was—and still is—a gentlemanly aircraft. It could be relied upon. In the hands of the most unskilled flyer it never displayed vice or temper. Even when a ham-fisted learner landed it with a series of terrifying bounces it showed no resentment and was apparently unharmed. On its next "circuit and bump" it was as docile and obedient as ever, and the heart of the pilot warmed to it.

The first of the long Moth series was developed as early as 1925, but the improved Tiger Moth did not appear until 1932. Since then 12,000 Moth aircraft of various types have been made, including 9,000 "Tigers," as they are affectionately called, most of them by the de Havilland Company in Britain, but some at the company's factories in Australia, New Zealand, and Canada, and some under licence in foreign countries. The Tiger Moth became the standard first trainer in the R.A.F., in all the Dominion Air Forces, and in the air forces of twenty foreign countries, and it has been used by hundreds of flying clubs in almost every country in the world. As long ago as 1928 the

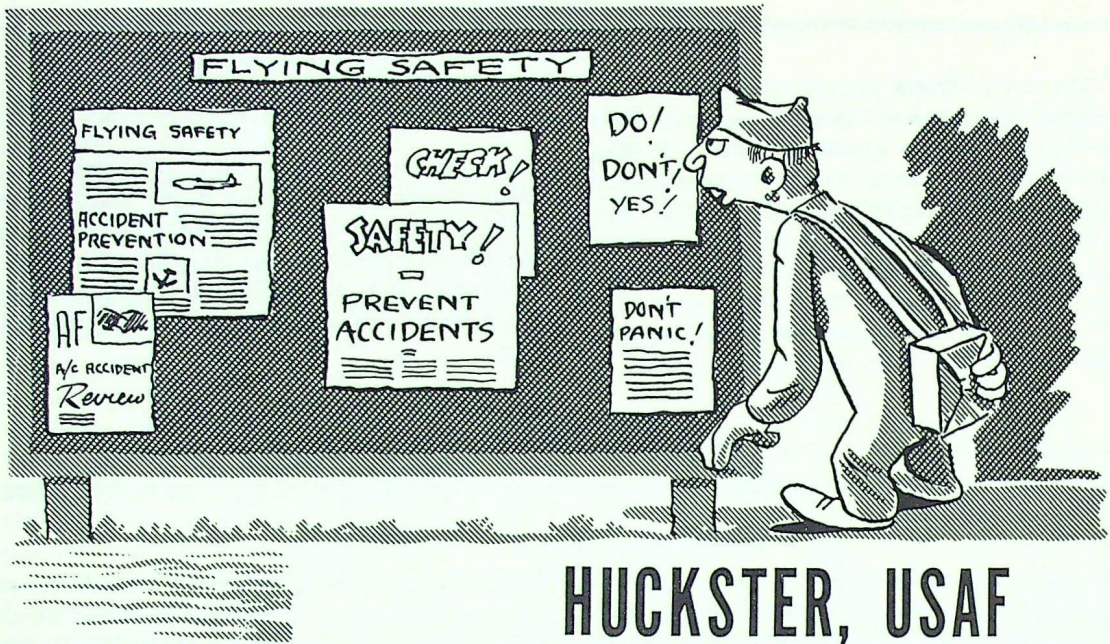
Moth won for Britain the world altitude record and the international 100-kilometre closed circuit speed record. The altitude was 19,960 ft., established by Mr. (now Sir Geoffrey) de Havilland, the head of the firm, and the speed record was 119.84 miles an hour, set up by Mr. A. S. Butler, the present chairman of de Havillands. The same firm's jet-propelled aircraft hold the same two records today, though there is a great difference



The de Havilland Tiger Moth

in the figures. The altitude record now stands at almost 60,000 ft. and the speed record at more than 600 miles an hour. And the faithful old biplane which began the tale with its own feats has stayed on until now as an indispensable character in the story, nursing the first essays in the air of the men who went on to break the records—and to save their country from its enemies.

(From the London "Times")



## HUCKSTER, USAF

(Note by Editor of "Flying Safety": A veteran pilot, master of the sarcastic word, finds the Air Force a huckster and expresses his "admiration" in choice language in the following clever article on the Flying Safety educational programme. Inadvertently, he proved the point and "bought the soap," for only the ending to this piece is fiction. You see, he landed safely and remembered that "the successful flight is never finished until the engines are cut and the Form 1 is filled out." He now lives happily with no more serious worries than a few flying safety reminders before his eyes.)

★ ★ ★ ★ ★

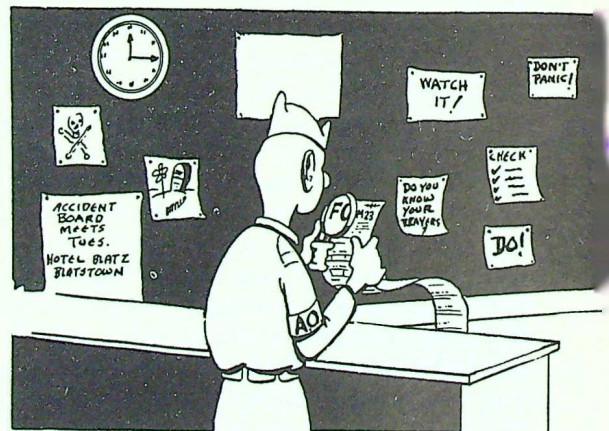
(Reprinted by courtesy of "Flying Safety")

"A RECENT FLYING TRIP to Muroc Lake afforded me the privilege of landing at several Air Force fields en route for the purpose of (1) re-fueling a C-45 airplane, (2) obtaining something to eat, and (3) stopping overnight for a rest and a contemplation of those diversionary pursuits which become more plausible with each added mile from home base.

"This was the first extended flight I had made since returning from overseas and it was a revelation to note the improved trend of thought toward the FLYING PROBLEM. It was evident that someone had devoted considerable effort, plus a lot of public expression, to the fact that (1) airplanes are dangerous, (2) all pilots are dopes, except when serving on accident committees, (3) airplanes will not withstand impacts against mountains, (4) a pilot, cleared 'contact', had better damned sight stay 'contact', and (5) if an air-

plane dives into the ground it was because 'all the altitude in the world is no good if it is above you'.

"Upon all of the walls in every operations office, adorning the mirrors above the bars in the Officers' Clubs, plastered on all bulletin boards, and obscuring such vital informatives as O.D.



rosters, Women's Club agenda and 'pro' station locations, there were pictures of airplane accidents and descriptions of aircraft accidents. Very interesting they were too—some of them—and I missed two buses, a train connection and one possible blonde, because I became so absorbed in reading about what happened to 'Captain G . . . , who took off in a B-25 for a routine night cross-country training flight.'

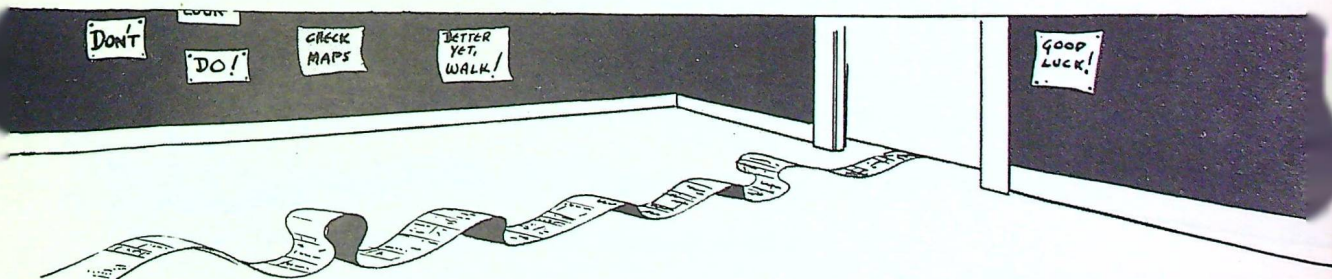
"It seemed that Captain G . . . had had three thousand hours in B-25's, but on this occasion he neglected the vital point of crawling back into the aft tail section to check for foreign objects before taking off. Two hours east of Albuquerque, and after properly and legally changing his flight plan from 'contact' to IFR through the CAA, the Army Flight Service, the St. Louis Control and the W.C.T.U., Captain G . . . noticed that the B-25 had become unreasonably tail heavy. Within a few moments the backward force on the control column was so great that he had to put his feet against it and push with all his strength. The copilot finally realized that something was amiss, so he too put his feet on the wheel and began to push. Their combined pushing was in vain, and the B-25 crashed and burned.

"The only survivor was a Roumanian stowaway in the extreme aft tail section, and he confessed later that he had only taken out 'first papers'. The accident committee concluded that a diminishing fuel supply caused the weight of the stowaway to effect adversely the balance of the airplane, and recommended that in the future all Roumanians carry evidence of citizenship. (Note: There has been a noticeable decrease in the number of B-25 crashes in the vicinity of Cincinnati.)

"Gruesome reminders of pilot frailties dogged me at every stop—and at every seat. I was happily visiting that boon to all travellers when my eyes rested momentarily on a cubicle partition. There, thumbtacked on the plywood, was depicted the smoking ruins of a C-47, with a two-inch caption stating: 'This pilot forgot to raise his flaps on the go-around!' Hastily pulling up my own flaps, I got the hell out.

"I wandered, somewhat feebly, to the clearance desk, trying to dismiss the dismal thought that, no matter how good a pilot thinks he is there is always something he does that could end in a crack-up if certain circumstances follow certain action. This was to be the last lap of the trip. Six hundred miles to go, and the weather was marginal. 'Marginal' means only that nobody, including the weatherman, knows just what the hell is going to happen to the weather. I began to fill out the clearance form—which is a test of sobriety, patience and mental agility. There is no continuity to the thing; the first blank spaces are devoted to the names and religious affiliations of the passengers, then there is an incontinent skip, 'Do you have a flashlight?' 'Is everyone equipped with a pro-kit?' 'Is any communistic tendency evident?' and 'Do you solemnly swear that every light in the airplane is working?' In an inconspicuous lower corner there is a space to indicate where the pilot is going and how he intends to get there.

"I signed this clearance form in approximately 20 places. The 19th signature put me on record as claiming that this C-45 had been weighed and physicked at 1315 hours on 3 September 1946, and had not gained an ounce since that time. Then the A.O. presented himself with a smiling frown:

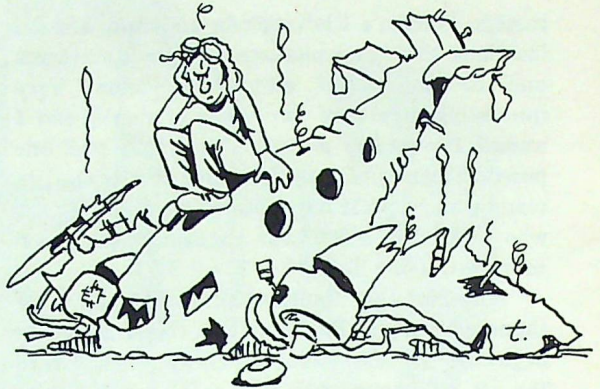


“‘Sir, do you have an instrument card?’

“I proudly pointed to the command wreath on my wings and stated that Mr. Truman had advised me I could sign a clearance if I put my mind to it without the instrument card. I gave the A.O. a stony glance, but did not, I positively did not, tell him that I had been flying bank and turns since he had worn three-cornered pants. Then came the vital question. ‘Sir,’ said he, ‘we haven’t gassed your airplane yet because you didn’t tell us last night exactly how much fuel you had left in your tanks.’

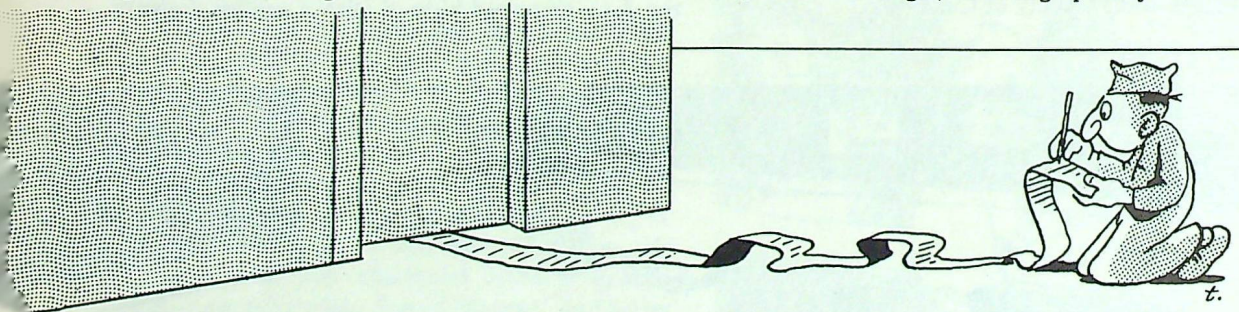
“Two hours later I was ready to go. My pulse was still strong and heart action good. I soon found that the weatherman was all wrong, because I had to climb to fifty thousand feet, where I dallied around for an hour or so without oxygen—proving something or other. Then I came down lower to see what the rest of the world looked like. It didn’t look so good. I went up again. It didn’t look so good up there. Everywhere I looked it didn’t look so good, so I quit looking.

“Four hours later the destination hove into sight. I reminded myself that airplanes seldom crack up in the air; ‘it is usually a violent contact with the ground which results disastrously.’ But nothing could happen to me! I had faithfully memorized all the accident pictures on the bars, on the mirrors, the bulletin boards and in the latrines, and I could recite all the pilot errors from 1924 to 1947. I discarded, as unpatriotic, the sneaky thought that accident committees like to blame everything they can on pilots in order to give themselves a false feeling of security when they fly. I concentrated all my effort upon the problem of landing.



“That landing is a matter of history. It was going to be perfect; I remembered the picture of the burning B-25 on the mountain peak, and pulled back on the stick—although I was still two thousand feet above the runway. I recalled that to prevent a fire a good pilot always cuts his switches—so I cut all the switches I could find, and noted with deep satisfaction that both engines quit promptly. In order to avoid possible collision with any other airplane which might be under me on the final approach, I pulled back further on the stick, and immediately went into a spin.

“Another rule flashed into my memory, ‘Turn to the full tank before landing.’ Since all of the tanks were practically empty I turned the selector to the OFF position and hoped for the best. I had, by this time, definitely committed myself to the landing. I concentrated hurriedly upon some more accident rules. ‘A Good Pilot Knows the Condition of his Airplane at all Times’. So I left the cockpit and clambered back through the cabin, pausing now and then to test the structure with a thumping experimental finger, nodding politely to the



passengers en route. Then I noticed a strong smell of gasoline fumes in the cabin, so I immediately warned everyone against lighting anything except properly certified lighters. Rules were rules! I realized that the co-pilot was probably having a rough time all by himself so I hurried back to the cockpit, put on my parachute, buckled the shoulder harness, studied the 'G' file for a few minutes and strapped a bail-out oxygen bottle to my leg, making certain of course that no leaking oil lines were anywhere near the oxygen.

"I was thirty seconds ahead of my E.T.A., so I picked up the microphone and advised A.A.C.S. of the fact. This time the answer was reassuring and to the point, 'Los Angeles Air Traffic Control advises that you are in a spin and are approaching the east end of the north-south runway. What are your intentions?'

"The last thing which was absolutely clear to me was the memory of a vivid picture on the wall at Tinker, which showed a bedraggled looking pilot crawling away from an upside-down AT-6. His goggles hung over the nape of his neck, his collar and tie were askew, and his expression reminiscent of a college boy caught by an irate farmer—after molesting the 18-year-old daughter. There was something altogether pleasing about that expression, and it was with the happy picture that I departed the earth. The C-45 I was flying crashed, and all of us were killed, and this story was written by an amiable 'ghost writer' whom I subsequently encountered while he was 'holding' over the Hickory fan marker, just west of Pittsburgh."

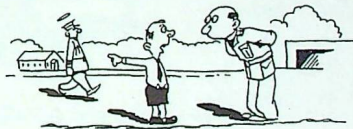
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## CASUAL REFLECTION

THE PILOT who finds himself in trouble in the Arctic will do well, when searching for a good landing spot, to make use of the natural "sky-map." In the Arctic, a uniform overcast with clouds at a high level reflects the terrain below it and gives a fairly dependable indication of terrain and general ground conditions. A uniform white

"sky," for example, indicates a uniform covering of snow. If the "map" is mottled, the region directly below is likely to be pack ice or drifted snow. Blue (new) ice is indicated by grayish patches, and open water, timber, and snow-free ground show up as black areas in the cloud reflection.



## PROMOTION

A certain Commanding Officer of a station on the North West Staging Route is still not quite sure what to make of it.

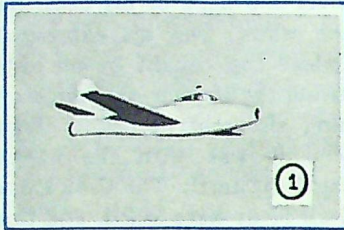
The Padre had started a Sunday School on the station. "Who," he asked the beginners' class, "is our Heavenly Father?"

"Please, sir," piped up one little chap, "the Commanding Officer."

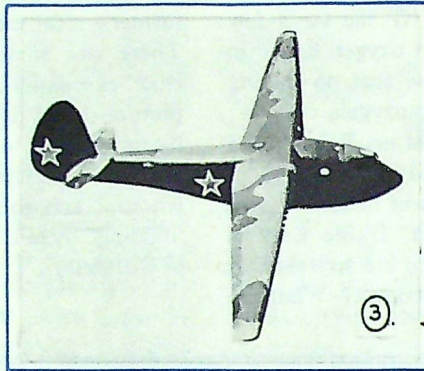
—S/L James Dunn

# Do You Know Them?

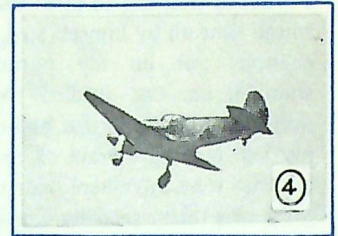
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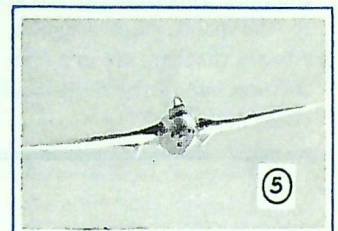
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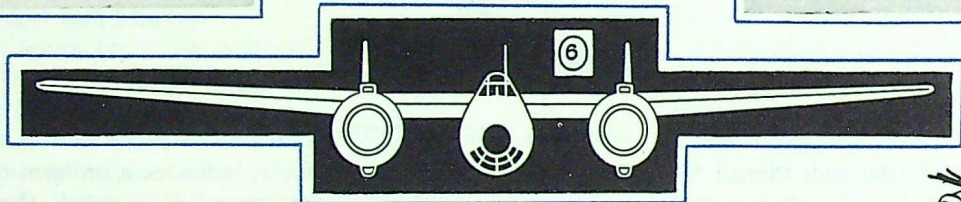
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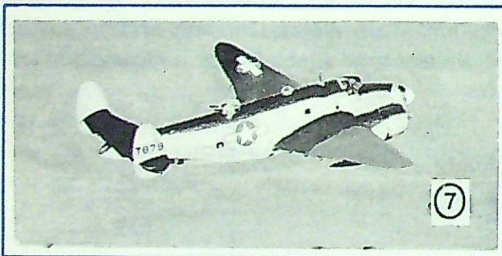
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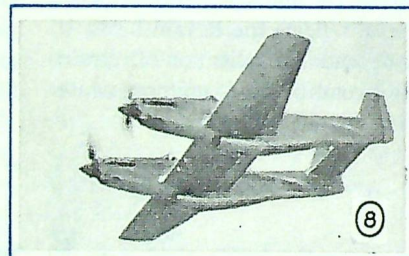
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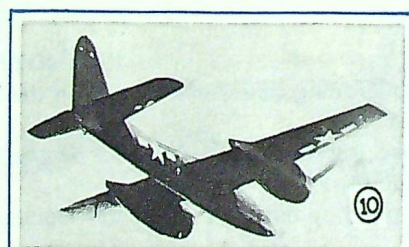
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# SOUVENIR of a SERMON

by Y. J.

THE PADRE felt in his pocket for a match. His fingers closed on a large jagged piece of shrapnel. He felt again its cold weight and steel-sharp edges. He was back again on the beaches of Normandy, a mile from the Channel, a few days after D-Day, 1944.

The Wing, a collection of Units in 83 Group of the Second Tactical Air Force, was tented beneath rows of apple trees. Through the middle of an orchard, bull-dozers had ripped a bumpy and dusty strip on which the aircraft roared in and out. The Wing had trucked in one bleary rain-soaked morning before daylight, cursed up its tents, and dug its slit-trenches. Sunday came, and the Chaplain conducted the service of Holy Communion at 8 A.M., three services at various attached Units, and in the evening the big communal tent was crowded for the final service of the day.

In his sermon, based on the scripture passages—"One thing I do," and "To him that knoweth to do good, and doeth it not, to him it is sin"—the Padre used the recently passed D-DAY to illustrate the difference a decision makes. He went on to speak of the indecision and procrastination in which most people floundered. He spoke of the mess a man finds himself in if he continues to postpone till the morrow what he should have done ten years ago. He pleaded for decision and action upon some one thing—one thing to be decided and acted upon that very night, be it such a central matter as committal to Jesus Christ or such a lesser matter as writing an overdue letter to Mother and Dad.

After the close of the service, the Padre went for a stroll around the Camp. He came upon an airman grunting and sweating as he picked and shovelled the beginning of a slit trench. The Padre stopped.

"Better late than never, son," he said, "but you should have dug that trench the day you got here. You've been taking a mighty big risk."

"I know it, Padre," grinned the airman, "and I suppose I shouldn't be labouring on the Sabbath.

But you are responsible."

"I am?" exclaimed the Padre.

"Yes, Sir, you are. I was to church tonight and you asked us to do some one thing which we had neglected, so I decided to dig this slit-trench, and I am digging it."

The Padre laughed and remarked, "Well, under the circumstances, I guess I'd better do more than watch you work."

So the Padre helped excavate, although before the job was finished he almost wished he hadn't offered. Digging had never been a popular pastime with him.

On Tuesday morning the Padre was awakened by a scratching at his tent-flap and a voice, "Hello, Padre! Are you awake?"

"I am now," growled the Padre sleepily. "Come in, but don't drag the tent down."

A figure pushed into the tent. It was the digging airman of Sunday night. "Dear me," said the visitor, "I'm ashamed of you Padre. It's six o'clock. You should arise and gird your loins and sally forth."

"Never get up until three minutes past six," grumbled the Padre, now wide awake. "What's on your mind?"

"This," replied the airman, and threw down beside the door a large piece of metal. The Padre glanced at it.

"Just a bit of shrapnel," he observed.


"Yeah, I know," rejoined the airman, "but a kinda special piece as far as I'm concerned. That naughty thing came from heaven last night while Jerry was peppering the airfield. It went through the tent, through my pillow, through the straw, and into a foot of earth. Now if I hadn't been in that slit trench which I dug because I went to church on Sunday and heard you preach a sermon, it would have been just too bad for my head on that pillow."

The Padre picked up the fragment. "Quite a souvenir," he remarked, as he hefted it. "How about letting me keep this as a souvenir of a sermon?"



# NUCLEAR ENERGY

## for AIRCRAFT PROPULSION



### Possibilities and Prospects

(Reprinted by courtesy of "Interavia")

IN THE SECTION on aeronautical research, the report on U.S. rearmament in the air published at the beginning of this year by the Presidential Air Policy Commission, stated, among other things, that immediate steps should be taken to intensify research on the employment of atomic energy for the propulsion of aircraft.

At the time this statement was made, the NEPA Project (NEPA meaning Nuclear Energy for Propulsion of Aircraft) had been proceeding at Oak Ridge for over a year, so that a certain amount of clarity must reign in connection with the fundamental prospects of the idea. It is also to be assumed that the knowledge gained up to that time was sufficient to justify continuation of the project.

\* \* \*

What would be the characteristics of an engine driven by atomic energy, suitable for installation in aircraft?

Steam engines, which would seem to offer the simplest means of exploiting atomic energy, could obviously not be used in conjunction with aircraft. The particular way in which nuclear fission furnishes heat, moreover, precludes application of the principles of the reciprocating engine. Judging on the basis of present-day knowledge in this domain, it would seem, therefore, that nuclear power units for aircraft would have to embody the principles of the gas or hot air turbine and of the ram-jet engine.

Technically and constructionally, a pile is called for through which, for example, a neutral gas or air is pumped. In this process, however, it is unavoidable that not only the constructional

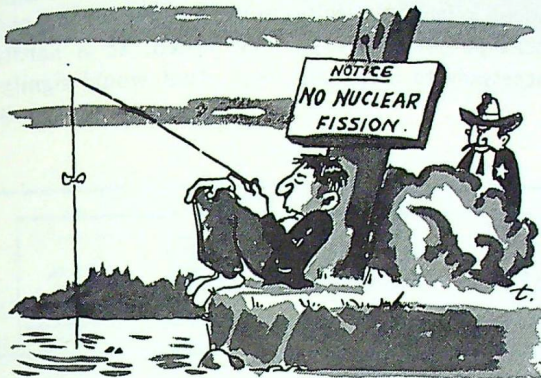
materials of the pile and the heat carrier, but also all other machine parts, will become more or less strongly radioactive under the effect of the intense nuclear radiation. This means that an engine consisting of a pile and a heat converter, which is or has been operative, may not be touched by humans for the purpose of regulation or restarting, and for a long time may not even be inspected from close proximity.

A limitation of this sort is of course unthinkable with respect to an aircraft. It would be least unbearable in conjunction with a ram-jet, which features no moving parts and therefore requires little maintenance. Hence, a ram-jet fed with atomic heat would seem to be the simplest and most likely attainable form of nuclear power plant for aircraft.

The atomic fuel, that is to say the fissionable original product, with which the stationary atomic power station of the future will be fed, is primarily pure uranium. Besides this, it is also necessary to have considerable quantities of graphite, which serves as a tamper to cut down the speed of the neutrons. For reasons of weight alone, an uranium pile could not be used for aeronautical purposes. More favourable possibilities, however, are presented by plutonium, which represents a concentrated source of atomic energy and does not require any additional tamper. The slow and controlled chain reaction of plutonium has already been realised. Another concentrated but very expensive source of atomic energy is represented by the U 235 isotope, and there is no reason not to expect that the future will provide further fissionable substances featuring perhaps still better qualities. At all events, it should be possible one day to harness the destructive effect of the detonation of a few kilogrammes of fissionable material

and follow it up with a controlled chain reaction allowing for an adjustable production of energy. It is also conceivable that the weight factor may be kept within reasonable limits.

The main technical difficulty is presented by the dangerous radioactivity, fatal to living organism and also detrimental to many constructional materials. Nuclear fission and



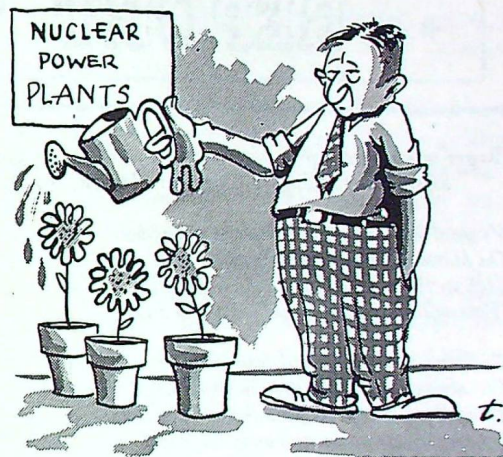
the production of atomic energy is indivisibly coupled with strong particle radiation (alpha, beta, and neutron rays), as well as the extremely dangerous electro-magnetic gamma radiation.

Of these, the alpha and beta particles are relatively harmless, and can be screened off by fairly light materials. Their effect is quickly weakened after a short passage through air, and further screening can be effected by aluminum, thus a very light-weight constructional material. The positioning of nuclear engines well towards the tips of the wings would, in the case of large aircraft, afford adequate protection to crew and passengers. The neutron rays, however, offer great difficulties since many constructional materials brought into contact with them can become radioactive, and their effect on living organism is extremely damaging. But there exist materials, for instance cadmium or boron, which are not too heavy and reflect them without absorbing them.

The most serious difficulty of all, however, is presented by the short-wave gamma rays, whose intensity, in view of their deadly effect on living

organism, must absolutely be kept within limits. The bearable amount of radiation which a human can support in a day is estimated at 0.1 x-units per eight hours. This corresponds to the radiation of 1/50 grammes of radium, or 3,300 gamma rays per square centimetre of 2 million electron volts (2 MEV). Gamma radiation is so penetrant that a quantum of 2 MEV is subjected to a reduction of 10:1 only after travelling 400 metres through air or penetrating a lead wall of 4.5 centimetres in thickness. The radiation produced by nuclear fission, however, concerns many million x-units and a radiation which contains many times more energy than that from radium.

Under these circumstances, there is no other means of screening off nuclear power plants than



with thick and heavy plates of lead. Meanwhile, in the special case of aircraft, an alleviation of these conditions is provided insofar that the power units can be positioned some distance from the fuselage and only a small area of them, and not on all sides, need be screened off. The greater part of the destructive radiation, together with the hot air stream which would by then have become radioactive, would be ejected through the tailpipe into the atmosphere, whereby this would all the same give to a strongly-ionised and radioactive wake. This gives birth to special problems as regards the "poisoning" of the air space and the utilisation of radio equipment. Apart from such disadvantages, however, it remains for the future

to show whether it will be possible to keep the weight of nuclear power plants and their screening media within bearable limits.

To sum matters up, it is clear that the possibility of using atomic energy for the propulsion of aircraft is not to be ignored. There are reasons to suppose that atomic energy will only be utilisable for very big aircraft, since chain reactions in conjunction with the fissionable elements known so far, cannot take place unless the element is in sufficient quantity, thus requiring a large-size pile.

The surmounting of the enormous difficulties which are coupled with the project for applying nuclear energy to the aircraft propulsion field, would doubtlessly be worth while if it were successful. For it would represent a big step forward in aeronautical science: with a few kilogrammes of fissionable substance, even though the power plant might have to weigh a number of tons, it would be possible for large aircraft to be propelled at high speed over practically unlimited distances—and perhaps even at supersonic speed. It is hardly necessary to emphasise what that would signify.  
S.

## ★ ★ REPORT TO ROGER ★ ★

(Roger was a fighter pilot who was shot down on a night sortie over the English Channel in August, 1944.)

*We won! We walked the Victory road and bore  
The blazoned banners of our martial pride  
High in the wind, and shrill the bugles cried  
"Farewell" to you and all the youth that died.*

*'Tis done. You know; or do you know we won?  
You always said we would; you who believed  
With all youth's simple faith that no grim cheat,  
Not even Death, could steal away the bright  
Bright glittering fruits of our sure victory.  
You were so eager, swift to race the sun,  
Laughing at danger in the flak-filled night,  
Playing with brilliant recklessness the game  
Of "Tally Ho!" as bandits swarmed the sky.  
And in that final moment when the flame  
Of blazing Spitfire spiralled down to earth,  
I thought I saw the white wings of your youth  
Bear to the heavens more than earth received.*

*Roger, sometimes, when all about is still,  
When through the house soft-footed silence creeps,  
About to wind its cloak around the night,  
I see you standing there. I talk to you,  
So smiling, full of life, so purely whole,  
Wearing with nonchalance the sombre robe  
That Death draped round your slender, youthful form.*

*You know we won; but are you satisfied?  
Have we in blundering ignorance betrayed  
The sacred cause for which you nobly died?  
Have we but lit a candle in the sun  
Instead of the bright torch so dearly won?  
Have we let slip the silken bonds of Peace  
To be re-bound in bloody chains of war?  
Have we been traitors to your high ideal?  
Have we forgotten your last sacrifice?*

*If you think this of us there shall not be  
Honor for us to whom you cast the load.  
If you think this, then all the countless hosts  
Who paid with you the swift and final price  
Have as their right to rise and swift condemn  
Us who remain as traitors to the cause.*

*But, Roger, know you this: we have been tried  
And still are being tried in that swift fire  
Of circumstance that yet may sweep the world  
Once more into the holocaust of war.  
We are not traitors, nor are you betrayed.  
Still hallowed is your shrine of sacrifice,  
Still in our hearts there lies your wish for Peace.  
But, Roger, there is one thing you must know:  
If others lift again the threatening sword  
We shall not hesitate to raise once more  
Our flag of freedom. If this is to be,  
Give us your strength until eternity.*

—Sqd. Ldr. Richard C. Tiplady.



*Based on Paper by*

**Lt.-Col. W. L. Clay**

*Ordnance Department, U. S. Army*

*(Reprinted by courtesy of the "S.A.E. Journal")*

**INDUSTRIAL RESEARCH EXPERTS** and universities are exploring astrophysics, cosmic rays, ionization, atmospheric, and biological phenomena of the upper atmosphere while the Army and Navy are advancing knowledge of offensive and defensive rocket warfare at the White Sands Proving Ground, N. Mex.

The present programme with the V-2 rocket began in March, 1946, and will close this year. This will be followed by a series of launchings of the Martin Aerobee, and as soon as it is finished, with Martin Neptunes. That part of the test programme is expected to run into 1951.

V-2 rockets used in this work are copied as closely as possible from the German prototype as to weight, weight distribution, and overall dimensions. But the rocket is filled with elaborate instrumentation to record phenomena that have been until now, far beyond the range of man's knowledge.

First modification has been to increase height reached by altering the German V-2's trajectory. A new nose tip was designed to house experimental and test equipment. The nose section was also changed to take cosmic ray counters, solar spectrograph, and the body was sealed at one atmosphere at ground level and housed electronic equipment, batteries, and ground controls used prior to launching.

A radio system which permitted an operator on the ground to cut off the fuel supply was an adaptation of the five-channel FM control system developed during the war. It is so designed that three channels must be closed before cutoff is accomplished, minimizing unintentional cutoff of fuel due to electronic disturbances.

Complete details of the German V-2 rocket have never been assembled, and most of our knowledge of the weapon came from examination of damaged parts, interviews with captured German technicians, and manuals, but only four launchings of the first 25 rockets were failures.

On one of the launchings photographs were taken of solar spectra, the first ever obtained from above the ozone of the upper atmosphere. Solar spectra in the ultraviolet below 3400 Angstrom units were photographed up to the altitude of 88 km (54.68 miles), and showed that with increased altitude they progressively extend into the ultraviolet. Comparing these pictures with the spectrum of a calibrated carbon arc to extend the curve of average radiant energy as a function of wavelength, the ultraviolet intensities are much less than had been predicted, this experiment showed.

The first data on cosmic rays obtained above the atmosphere where the primary radiation could be studied directly were obtained with other rockets with specially equipped laboratory counting devices which telemetered the information back to the launching station.

The first four rockets assigned to this investigation disclosed that the greater portion of primary radiation of the cosmic ray consists of particles hard enough to penetrate at least 12 to 15 cm of

lead, and about one out of every five such particles will produce a shower in 12 cm of lead.

This work also disclosed that a non-primary soft component exists above the atmosphere, equal to about one-fourth the total number of particles present.

Telemetering devices to record findings aloft are important because recovery of an undamaged record after the impact of landing is seldom possible. Parachutes are used, but the landing impact is about 2400 mph unless the speed is decelerated.

The equipment used to telemeter the information to the ground station includes a 23 channel sequential pulse time modulated transmitter, with a peak output of 1200 w at 100 mc. It is mounted in a pressurized case, and weighs about 150 lb.

Its chief job is to automatically radio back to the receiving station on the ground temperatures, air pressures, characteristic of primary cosmic radiation, and properties of the ionosphere.

It also transmits the rocket's velocity, acceleration, skin temperature, and the motion of the control fins.

When data wanted cannot be reported electronically, the warhead or flying laboratory is made detachable, and exploded off at the proper time by

a radio link or a timing mechanism in the rocket. The aerodynamic characteristics of the rocket are spoiled, but with the warhead now in the tail section, it has a reasonably good chance of being recovered if it floats to the ground slowly.

Another method is to eject the instruments to which has been attached a large nylon parachute. Three smoke flares aided ground observers to locate instruments.

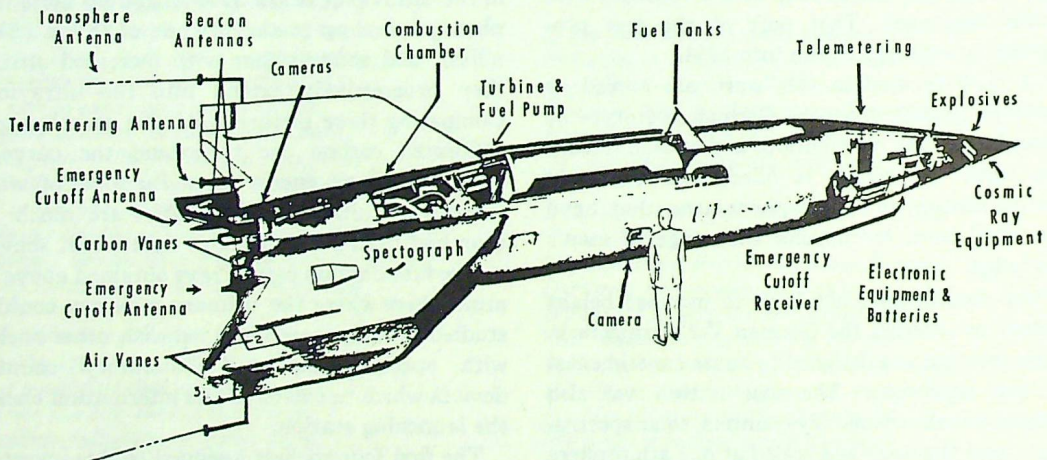
Trajectory, flight control, and other considerations are of particular interest to the Ordnance Department, Signal Corps, and Navy Department.

Calculations of the trajectory wanted are made before the launching, and the missiles are actually tracked in flight to see if they perform as required.

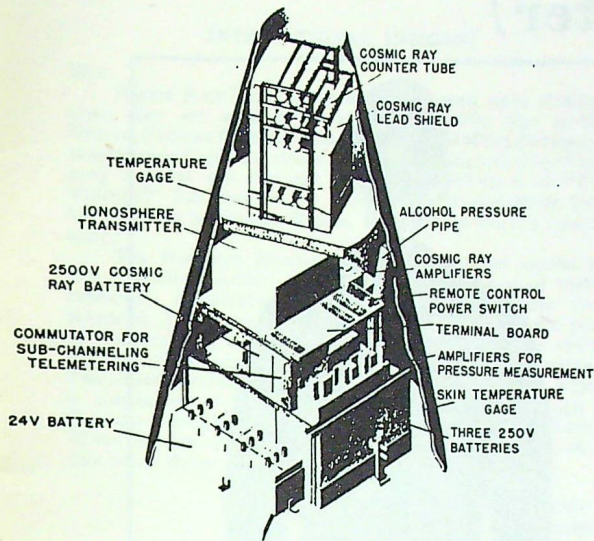
The three methods used in tracing the course of the V-2 are:

Optical, with 13 observation stations each equipped with high-speed moving picture cameras and other instruments;

Radio transmission on one frequency to the rocket and a retransmission to the ground station at twice that frequency. In this, the Doppler system, the outgoing and received signal beat together at the ground station, and this beat is



- V-2 equipped for study of earth's upper atmosphere



• Arrangement of recording instruments in V-2 warhead

the function of velocity of the missile. This system is also used in triangulation; Radar, which automatically traces the line of flight and the visual record is photographed.

From all the V-2 parts collected by Army and Navy technical intelligence personnel overseas and shipped home, only two complete rockets could be assembled. Despite interrogation of German personnel and examination of German specifications and drawings, complete technical data on all the components is unavailable.

Parts were carefully examined and analyzed for chemical composition of materials, dimensions, and workmanship. In one case more than 40 manufacturers were contacted before one was found which could produce a part with metric dimensions.



One failure was caused because a graphite vane disintegrated soon after launching. It headed off east instead of north, but the fuel was cut off from the ground control station.

Another exploded at 28,000 ft. 27 sec. following takeoff. Visual inspection of the wreck indicated that an outboard bearing overheated and this caused the fuel tanks to let go.

Steering failures accounted for several unsuccessful launchings. German technicians, however, explained that they had faced similar types of trouble during the last phases of the war.

One of the two gyroscopes which control the V-2 prevents the roll and provides control in the azimuth. The other, a pitch control unit, to control trajectory during the burning period. Their axes maintained the direction in which the rocket was aligned during the burning period, and in flight maintained this direction, one along the rocket axis, and the other horizontal and perpendicular to the direction of the target.

Deviations were detected by potentiometers which furnished control voltages to electrical-hydraulic servos.

## Two Maxims

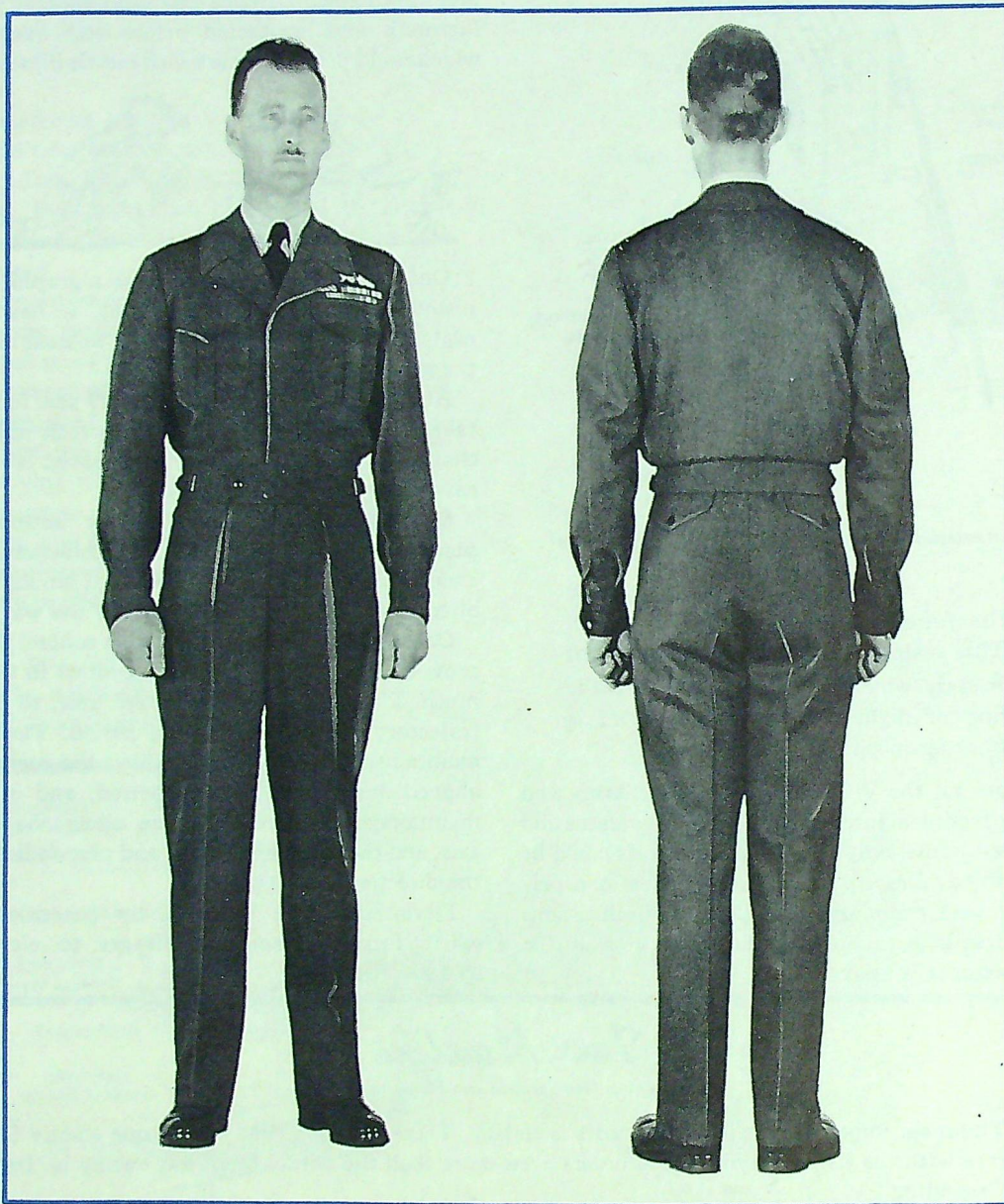
(Courtesy of "Revista de las Fuerzas Armadas")

The most important quality in an order is clarity. There exists in time of war one enemy that can interfere with the strict carrying out of orders even more than the actual foe. That enemy is 'Imperfect Understanding'.



A general law of the technical evolution of warfare prescribes that with each succeeding war man must go farther, more quickly, and at greater height or depth, in order to conquer his opponent.

# New R.C.A.F. Working Dress (Winter)



**TO BE ISSUED TO AIRMEN WHEN AVAILABLE**

# LETTERS TO THE EDITOR

## INTERNATIONAL INCIDENT

Sir:

Before East-West relations become even more strained than they are at present and Mr. Vishinsky cites in the United Nations Council yet another example of the outrageous reactionary Capitalist claims to Soviet records and inventions, may I point out that the November 1948 issue of "The Roundel" has claimed for North America something that legitimately belongs to Russia, namely "the world's coldest spot."

The Northern Siberian climate is somewhat similar to the Canadian Arctic, but the extremes experienced there, especially temperatures and winds, are much more pronounced. The average January temperature of the cold pole of the world at Verkhoyansk in Northeast Siberia is  $-58^{\circ}\text{F}$  and the thermometer drops to  $-80^{\circ}\text{F}$ , or near, every winter. The lowest recorded temperature at this station is  $-90^{\circ}\text{F}$ , which is considered to be a world's record minimum, although a Russian scientist noted a temperature of  $-102^{\circ}\text{F}$  in the Leena River district, about two feet above the earth's surface, on a day when there was a marked surface inversion.

G. T. HARMAN, S/L  
Editor, "RCAF Navigation Bulletin,"  
ANS, Summerside.

## A LOGICIAN OBJECTS

Dear Sir,

The two articles on the "Accurasian Affairs" by G/C E. S. D. Drury in the November and December issues of "The Roundel" were interesting, amusing and instructive—i.e. they had all the essential qualities of a good article.

There is one point, however, that puzzles me. (I readily admit that I know nothing about the subject). In both articles the author assumes a 25-yard average error by the two pilots, which, in the case of the Second Accurasian Affair, "would mean, on the average, one tank probably destroyed per three sorties." I do not understand the validity of this assumption. To illustrate, I might miss with my first rocket by 10 yards, with my second by 40, and with my third by 25, which would give me an average error of 25 yards. This might continue indefinitely with an average error of 25 yards, or even better, and yet not one tank would receive a direct hit and be destroyed. Would not the average number of direct hits be a better basis for calculation than the average error? In my ignorance of the subject I have probably overlooked some simple fact; if so, I would appreciate enlightenment. (No doubt "the simple fact" is just that all marksmen are not such consistently bad shots as I.)

By the way, I was impressed with Major Roceteero's amazing performance, as reported in Table 1 on page 9 of the December "Roundel." On the 19th and 21st days of his duel, with a daily expenditure of 6 rockets he destroyed 6.25 tanks. Twelve and a half tanks with 12 rockets is very nice work. Perhaps the gallant Major could be prevailed upon to tell us how he did it. (If it were Count. Weltwistle no explanation would be required.)

Incidentally it was gratifying to note that "The Roundel" regards our two senior padres as men of "principle" (vide December "Roundel," page 14 and 15) even though our agnostic AFHQ persists in calling them simply "Principal Chaplains."

Yours truly,  
Clio Aero Nautica  
Ottawa, Ont.

## AN EX-TYPE TAKES THE PLUNGE

Dear Sir:

It all began on a February morning last year in England. After six months of civilian life I was just about fed-up. I had been reading in the paper over breakfast the usual advertisement asking ex-airmen to return to the R.A.F., and I had decided to fill it in and post it on the way to work, when I heard the thump of mail dropping through the letter box on to the hall floor.

It turned out to be my copy of "AIR MAIL," the Royal Air Force Association magazine for ex-R.A.F. personnel. On perusing its pages I noticed a headline: "There Are Vacancies For Ex-Types In The RCAF." I forget the exact wording, but whatever it was it appealed to me instantly, and I went off to work in a much more cheerful frame of mind.

The more I thought about the proposition that day, the more I liked it; and the moment I got out of work I phoned my pal and told him the glad tidings. Over a few beers in the local (the weekly supply had just arrived, so we were assured of at least two each) we thrashed the matter out... and our joint letter of application went in.

Nothing happened—anyway, not for six weeks.

Then one Monday a letter arrived requesting my presence at London H.Q. the following Tuesday week. Jack, I found out later, had to be there a week before me...

I could hardly wait until he got back to hear how he'd got on. His tale, when I heard it, shook me to the core. What he had to say about medicals, interviews, and other ordeals was enough to put the wind up a ghost; and it was in fear and trembling that I went off the following Tuesday.

Everything was exactly the reverse of what Jack had told me. I encountered nothing but courtesy, efficiency, and friendliness... and after a marvellous trip on the "Aquitania" we landed at Halifax in mid-June.

Jack and I parted at Toronto, bound for separate Stations.

I arrived in Hamilton with 25 cents in my pocket. I confess I felt a bit lonely—a stranger in a strange town in a strange country, wondering what the Sam Hill to do next. However, after some trouble I finally found the Air Force H.Q. and made myself known. There, I was soon made to feel at home, and within a few days I had been paid, fixed up with kit, and generally settled down.

Since being here I have made some very good friends indeed, and not for a moment do I regret the decision Jack and I took that evening in the local. I regret only one thing, and that is that I didn't have this chance sooner. In my short experience of them, I've found the people of Canada to be warm-hearted and true friends, and I hope I shall continue to do so throughout my entire Service career.

LAC T. W. Scott.

## APOLOGY

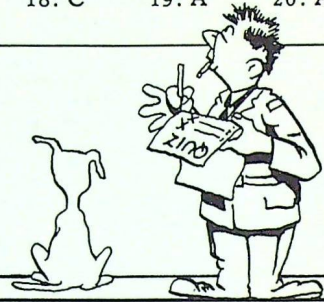
The Editor wishes to apologise for the error in the January issue of "The Roundel," which credited "The Third Accurasian Affair" to "The Aeroplane." This article was, of course, reprinted by courtesy of "Air Clues."

## Answers to "Do You Know Them?"

1. Thunderjet
2. Thunderbolt
3. A-7
4. Yak-7B
5. Vampire
6. TU-2
7. Ventura
8. Twin Mustang
9. York
10. Tigercat

## Answers to "What's the Score?"

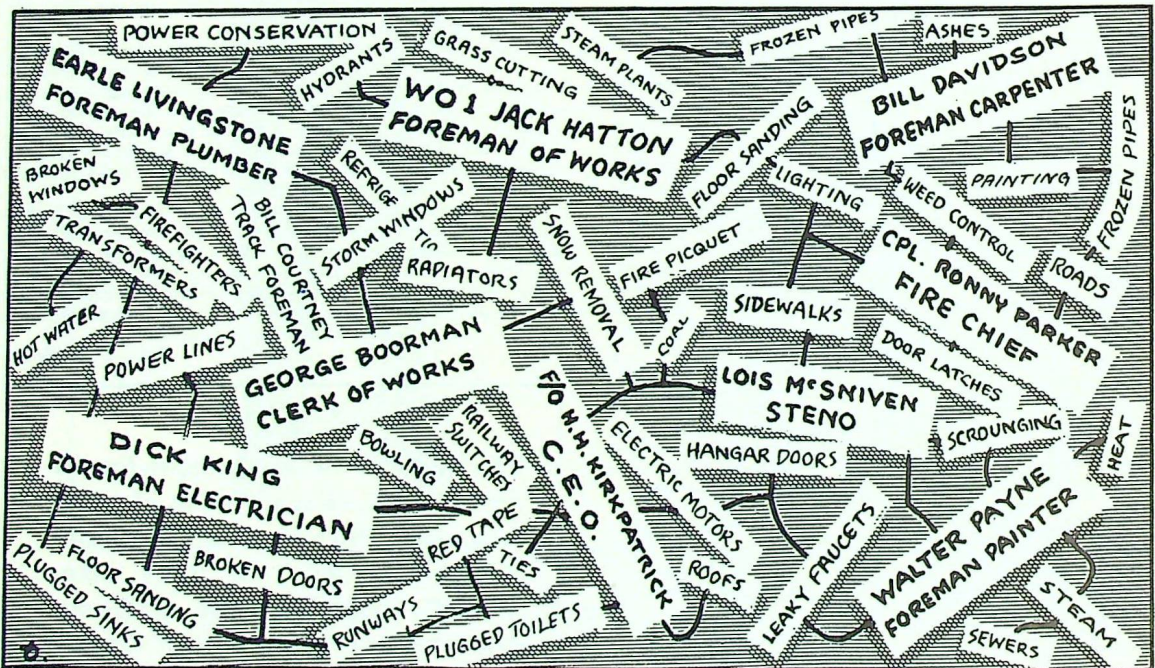
- |       |       |       |       |
|-------|-------|-------|-------|
| 1: C  | 2: D  | 3: A  | 4: D  |
| 5: D  | 6: B  | 7: C  | 8: B  |
| 9: C  | 10: B | 11: B | 12: A |
| 13: C | 14: A | 15: A | 16: D |
| 17: D | 18: C | 19: A | 20: A |



## EFFICIENCY NOTE

The chart shown below is reproduced from the Christmas issue of "The Bordenaire" in the hope that it may assist other Units in solving their organizational problems. As its

designer explains, "by following the lines one can trace the chain of responsibility and see just how the C.E. Section functions with such exemplary co-ordination."



THE EDITOR THANKS THOSE MANY READERS WHO HAVE SENT HIM LETTERS OF CRITICISM. SUCH LETTERS ARE INVALUABLE IN HELPING TO MOULD THE FINAL CHARACTER OF "THE ROUNDDEL." HE WOULD, HOWEVER, LIKE TO SEIZE THIS OPPORTUNITY OF POINTING OUT TO THOSE WHO WANT MORE ORIGINAL ARTICLES FROM OUR OWN SERVICE THAT MERE WISHING NEVER BUTTERED NO PARSNIPS . . .

*Address that contribution you've just decided to send in, to:-*

**"The Roundel,"  
Room 2540,  
D.N.D. Bldg. "A",  
Ottawa, Ont.**



