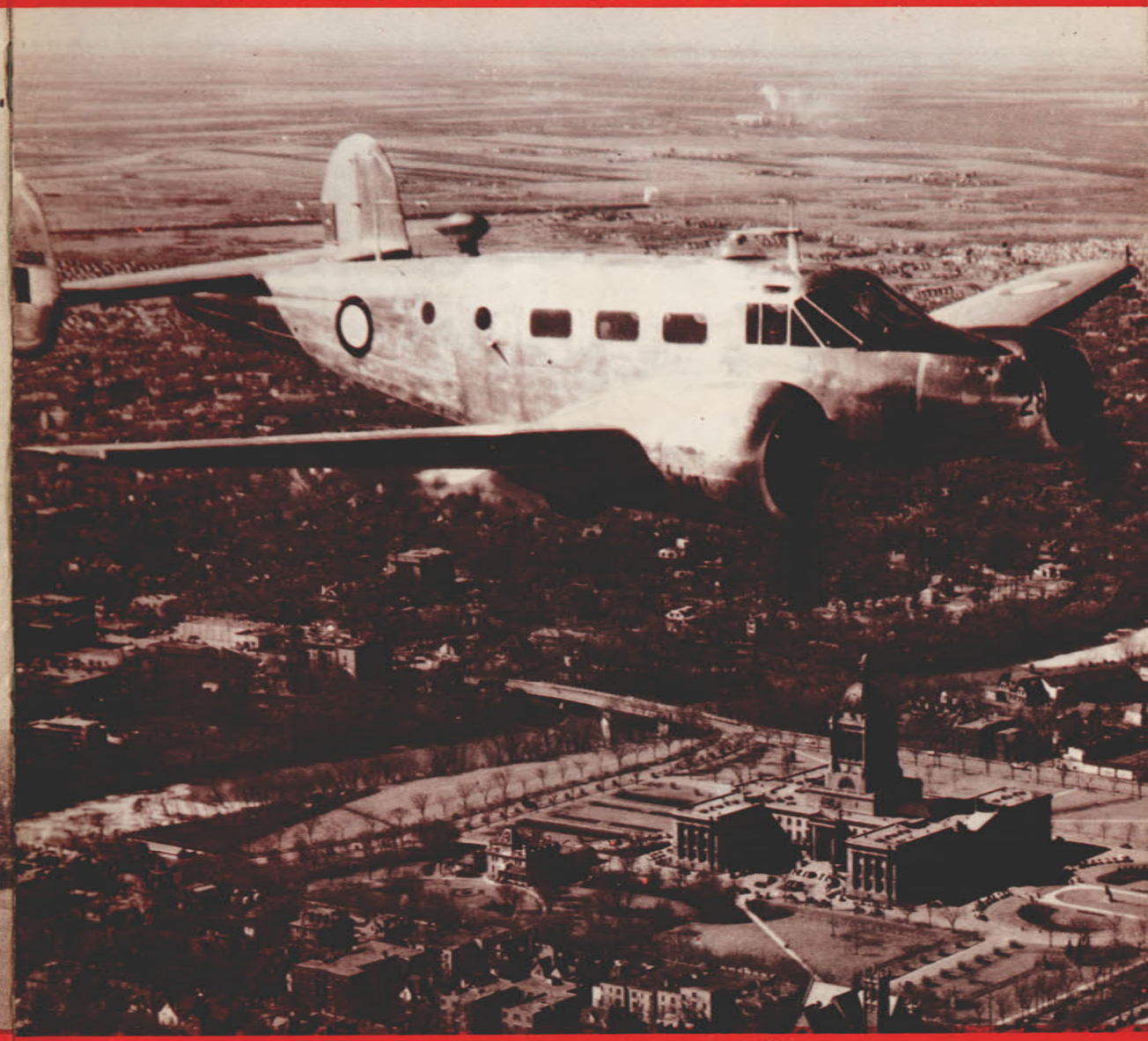
"NORSEMAN" equipped with pontoons at work over the Winnipeg area during the 1950 flood disaster.

VOXAIR

THE VOICE *of the* AIR FORCE

OFFICIAL PUBLICATION OF THE R.C.A.F. IN WINNIPEG



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VOXAIR

THE VOICE OF THE AIR FORCE

JUNE 21st, 1952

ACTIVITIES OF THE ROYAL CANADIAN AIR FORCE IN WINNIPEG

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EDITORIAL

CHOOSING Stevenson Field at Winnipeg as the site for 14 Training Group Headquarters and the Air Navigation School — which combined to the other units already operating, to make it one of Canada's largest air establishments, was a wise selection.

The field itself is roomy and modern — having adequate runway length and skillfully handled control and landing aids. Stevenson Field is the core of east-west air traffic for Canada and the aerial springboard for the minerally rich north. A future edition of VOXAIR will give readers a history of Stevenson Field — which is practically the story of the development of flying in Canada.

Winnipeg itself has all the attractions that appeal to an airman. There is entertainment for every taste — from dozens of movie houses, through the theatre to ballet, from pee-wee baseball to the Blue Bombers of the Western Football Conference, from public dances to hotel balls. Winnipeg is rich in historical lore and modern industrial growth — and its beautiful homes and parliament buildings. But its greatest claim to fame — through an airman's eyes — is the hospitality of its citizens and the wholesome beauty of its girls, surely nothing more need be said about the latter.

Cadets of No. 2 ANS can vouch for the extraordinary hospitality of Winnipeggers — for in this respect the city ranks second to none in Canada. Through the agency of the Central Volunteer Bureau, an extremely active group of civic-minded people, a hospitality committee has arranged and administered a wide entertainment programme. Probably first on the list is home hospitality—where cadets from NATO countries have been invited to private homes for dinner — or a full week-end. They have also arranged for partners for the cadet dances — as well as tickets for public entertainment and sport activities. It is so completely arranged that even welcoming committees, augmented by the Wartime Pilot and Observer Association and the Air Force Ladies Auxiliary, greet incoming courses. As an expression of gratitude for this hospitality, the cadet body entertained eighty-five underprivileged children at a Christmas party which was a complete and howling success. The C.B.C. thought it to be such a success that they broadcast a fifteen minute programme of it.

In considerably less than one year, this station has practically burst at the seams with its growth. Before the influx, reserve units and a basic maintenance staff kept the station going —and a fine job they did too — especially during Winnipeg's disastrous flood of 1950. Since then the flood of personnel, aircraft, equipment, renovations and new construction has descended. As a result, every inch of space is utilized and everybody is busily occupied in improving conditions. Incredible progress has been made in such a short time — and there is still so much more to be done.

With the terriffic influx of married personnel recently, it doesn't take much imagination to picture the chaos that would be prevalent had our units been located at or near a much smaller city. Think of housing alone! Even with its population of 350,000, housing experts have wrestled with the problem of finding reasonable accommodation for the families of officers and airmen.

But the "piece de resistance" is the weather. It has been suggested that the Chamber of Commerce of Florida and California come here to find what climate really is. This past winter was a snow shoveller's holiday and the only criticism to be made for the spring was that spring fever set in too early and lasted too long. Surely no one will belittle one boast that all heat records were broken in April — and that on one day Winnipeg recorded the highest temperature in all of Canada and the United States.

You're right! Winnipeg has been a wise selection!

By F/O KEN REID

Cover Story . . .

THE FIELD OF VIEW from an aircraft! It presents all the interesting aspects of life . . . the progress . . . the glories . . . the struggles . . . those with nature and against it . . . man with man and against man.

An A.N.S. Beechcraft Expeditor swoops over Winnipeg. The Legislative Buildings, crowned by the shining "Golden Boy," representing man's efforts to govern progress and to administer to his existence and needs — and to the left is the Lieutenant Governor's residence, the home of the Honourable R. F. McWilliams, Q.C., representing achievement and the solidity of security. The Amphitheatre, on the right, attracts the eye of the sports enthusiast, which represents the competitive and co-operative spirit of man. In the foreground, one sees the buildings formerly occupied by the University of Manitoba which have catered to the cultural development of man. Any view from an aircraft is a study of life itself!

'PEG PERSONALITY

GROUP CAPTAIN
L. H. RANDALL, D.F.C., C.D.

GROUP CAPTAIN Lawson H. Randall, D.F.C., C.D., is the Commanding Officer of R.C.A.F. Station, Winnipeg. G/C Randall was appointed to this position in January, 1951, after serving as Air Attache to the U.S.S.R. in Moscow for over two years.

Born in New Brunswick he received his formal education at Bristol High School. Later, he graduated from the New Brunswick Normal School and continued his studies at Mount Allison University, Sackville, N.B. Receiving his B.A. degree in 1936 he took up a position as Schoolmaster in Wellsford, N.B.

July, 1938, saw him join the Royal Canadian Air Force as a Pilot Officer. He graduated as a pilot in 1939.

A colourful career ensued during the war years. G/C Randall commanded Canada's first squadron to operate in the Far East. To this squadron, a Catalina Flying-boat Unit, he gave the name "Tusker" after the fighting bull elephant of Ceylon—island base of the squadron. Its record proved that it was well named. He was already a seasoned veteran of anti-submarine warfare in the Arctic and Atlantic before his term of service over the Indian Ocean.

Returning to Canada in 1944, G/C Randall attended the War Staff College in Toronto. After serving in R.C.A.F. headquarters in the Plans Division for two years, he went to the United Kingdom to attend the Joint Services Staff College. Later he became a staff officer in the Directorate of Personnel Administration at Ottawa—a position he held until his appointment to Moscow.

His position as Commanding Officer, R.C.A.F. Station, Winnipeg, has not been an easy one. However, his selection for the position was a wise choice as the smooth functioning of this—one of Canada's largest stations — can be seen. Under his careful guidance, it has gradually awakened from a long dormant period to the bee-hive of activity that it is today.

His tales of his many experiences have kept many a group of listeners spellbound. It can be said that life at Station Winnipeg has been made exceptionally pleasant by his kind consideration and understanding. It is with great pride that Voxair salutes our Commanding Officer.

A Typical Search

By S/L J. H. Simpson A.F.C.

(cont. from last issue.)

THE FOLLOWING morning the crews arrive back at the airdrome and are briefed for the day's operations. Both aircraft are alotted search areas.

They are to fly to Lac Pierre and do a track crawl at one thousand feet using a visibility of two miles. One will fly a mile to the left of the proposed track of the missing aircraft and the other a mile to the right until they reach the vicinity of Race Falls. Assuming that the two sportsmen had been able to maintain their track within a reasonable distance they would probably be sighted on this first run. If they have had some minor trouble and have landed safely on a lake along or near track and are unhurt they will have a fire going which will be easily spotted. However, if they have been in serious trouble and have crashed out of control into heavy bush the chances of discovering the wreckage from this height is very remote.

The idea is to cover as much territory as possible in the first few days within the probability area, in that area within a reasonable distance of the proposed track, in the hope that the occupants are still alive and can be rescued before succumbing to exposure, injuries, insects or hunger. Few people realize that insects in the North Canadian bush and muskeg areas are a real menace capable of causing death.

The two Dakotas are airborne at 0800 and set course for Lac Pierre which is two hours distant. On arrival at Lac Pierre the aircraft turn onto their respective tracks as assigned and all eyes commence scanning. The captain covers a similar area to starboard. The navigator may stand between the two—map reading and scanning the area directly ahead.

In the cabin four more scanners are placed strategically at the various windows so that a maximum area is being observed. If the aircraft is fitted with a large type astro dome a further scanner can observe all quadrants for smoke signals.

Usually the aircraft will stay in the area for a maximum of four hours after which time the scanners tend to become slightly "stare crazy" and every light coloured stone or strangely shaped tree appears to be an aircraft.

Inexperienced scanners are sometimes "over-eager" in reporting sightings which on examination through field glasses turn out to be rock formations, trees, etc.

It has been proven that after four hours of scanning the efficiency of the scanners will drop to a point where it is useless to continue. It any case the days flying time will be roughly eight hours which is more than enough if the crews are to last for ten days or more without their efficiency being impaired by fatigue.

We will leave the aircraft and return to the operations room once again where further information is being gathered and sorted into various categories. A long distance phone call has been made to relatives of the missing airmen in the U.S. and they are already proceeding to Winnipeg to render any possible assistance. The search master has obtained information that the owner and pilot is a veteran woodsman and carries full survival equipment in the aircraft, including a tent, rubber boat, insect repellent, rations for 30 days, guns etc. This of course will influence future planning. Also further reports are coming in from various seaplane bases and radio stations. These include sighting reports from trappers and Indians who have come in to isolated trading posts and described seeing an aircraft "heading thataway" —two moons ago. All these reports must be judged as to their value and some which appear accurate will have a definite bearing on future search areas to be covered. The float equipped Norseman has arrived from Lac Du Bonnet and will be flown out to land at the various lakes where the crew can interview the trappers further if their descriptions of the aircraft seem to fit.

Meanwhile several more Dakotas and a Canso have arrived to assist in the search. The search master and his staff having snatched forty winks during the day are now preparing to debrief the returning crews from the first two Dakotas. No sighting message has been received so the first days searching has been unsuccessful. The areas of probability have been extended and divided into large sections which will be covered the next day using a creeping line ahead at a height of 1,500 ft. and visibility of one mile. Eight Dakotas and one Canso will be used and hundreds of square miles searched. And so it goes on day after day. Sometimes old man weather interferes and all aircraft will be grounded for one or two days which can be very frustrating. The aircraft depart at 0800 and usually return about 1600 in the afternoon. The crews are tired and all they require is a "beer, food and the sack" after being debriefed. The search master is eager for clues but few of any value are forthcoming.

The sightings of the Indians and trappers have been investigated by the float equipped Norseman and proved blind alleys. After three weeks have passed many aircraft have run out of time and had to be sent back for inspections, the remaining crews are getting very weary and a feeling of hopelessness settles over the operations room.

However the search master is still confident and decides to work on the hunch that all aircraft drift of course to the east when flying a northerly heading. This was proved true on various other searches, possibly due to the prevailing winds. Assuming this then the possibility that the Fairchild has overshot it's destination by a considerable margin does exist. A new probability area is opened up North and East of Race Falls. The crews are briefed and the three remaining Dakotas take to the air. The Canso is still at the Pas but is under repair with magneto trouble.

At 1303 hours twenty-six days after the search began, where hope had all but been given up the dramatic message comes in—"aircraft sighted, undamaged, two survivors." The excitement in the operations room is tremendous. Five minutes before the staff had been sitting down engaging in desultory conversation and dozing. Now all are jumping up and down and thumping one another on the back. The scene on board the Dakota is similar if not more so. The aircraft is positively identified and the position confirmed. The Dakota is instructed to orbit the scene until the Canso which has been made serviceable can arrive. At 1400 after it has been confirmed that the lake is suitable, the Canso becomes airborne and proceeds to the scene. A water landing is accomplished and the two survivors are picked up safely and brought to the Pas.

A Day At 14 Training Group

THIS TITLE is headed "A Day at 14 Training Group." The writer would like to point out that the activities disclosed hereunder are a little different than the usual that prevail at Group Headquarters. Normal routine at a Group is pretty much the same as any other that would take place at a Command or Group level. It is not the intention of this article to relate to its readers the organization of Group since this phase was covered quite thoroughly in the first issue of the Station paper. It is worthy of mention, however, to note that our Group still in its embryo stage comprises of approximately\60 personnel under the direction of Air Commodore Bryans and responsible to Training Command for nine RCAF Stations in western Canada. With these responsibilities, 14 Training Group which became functional on the 15th of May has been a place of activity in all branches with little time out for play, however, anyone passing by 14 Training Group Headquarters on the afternoon of May 22nd would possibly hear, "Pull that rope, drive that nail, don't break that shovel or you'll end in jail." Blisters started, muscles creaked, and backs ached as the afternoon passed lazily on. With realization of personnel efforts, at 1600 hrs weary officers and airmen gazed at what we hope will eventually turn into a lawn in which we can all be justly proud.

I would venture to say that this is the first time at a Group HQs that administrative and clerical staff traded desks and typewriters for a shovel and a hoe on a mass production basis, and all turned out on a construction project that included the Air Commodore and his officers and airmen staff.

A few points viewed from on the spot scene that took place on this sunny afternoon last month. The Air Commodore surprised many labourers in handling a hoe and surveyors instruments (see picture) while Padre Scott handled with skill the rake and shovel; other names too numerous to mention portrayed with skill the handling of gardening tools that would in some instances make professional gardeners look like amateurs.

It was overheard that the Air Commodore would hesitate to run a plantation with the staff, however, it was encouraging to note that he would take a chance on running an Air Force, and after all we are not landscape gardeners.

Cpl. L. L. Haggerty

Twenty W. B. (2 ANS)

THIS IS salve et salvete. With this our valediction to Winnipeg, we had better tell you just whom you have had among you in the name "Twenty B." In the first place, Twenty course as a whole is the only all-British, all-Regular course in 2 A.N.S. In other words, the object of NATO—the integration of members of different services and nations being trained together the better to work together later on—is defeated from the start. We admit that we probably have deserved the appellation "cussed Limeys." We have ourselves grumbled unashamedly at certain aspects of training under "Colonials."

Now that we are going, we had intended really to work to create a wonderful impression of ourselves to leave with you for the benefit of those who come after us. Could this be? Well, the bank manager and his charming staff found broad smiles of relief when we told them we were on our way, and would like to take a photograph. That's about all they would let us take, and for that occasion, Mullinger, Phillips and Carter played the Englishman abroad, instead of the usual Saturday morning capers.

There are among us (or were, since we are now defunct), a group of intellectuals. This quality does not manifest itself so much in class as at the bridge table, charmingly situated as you will see in the photograph, between the third and fourth bunks from the North in Room 7 of Block 14. The only occasions upon which the representatives of this cult were ever seen in Greater Winnipeg was when a deputation of one went out to replenish the worn out gramophone records. He was never allowed away for long, he had to hurry back to that fascinating situation on top of the trunk, in that enchanting oasis between the beds, where the 'phonograph' disposed rich melody and discord to cover up the noise of the bidding.

There must be more than several of the cab and bus operating staffs of the city who would recognize at least three of our number even in a fog. These are those we have lost to the guileful girls of this city. Whom, may we say immodestly, know good men when they see them. However, they choose these three—Derek Carter, Bernard (she prefers it in full) Lines Mason, and Brian Stevens. The last two are married. Verb. sap.

No mention yet of navigation study? Well, we have taken it in our several strides, and some of us have been pretty unsurefooted. Methods of achieving the odd air mark have varied from out-bargaining Briefing and Analysis, to diligently obtaining and using all the information garnered on each trip, even if it took you to Grand Forks, North Dakota, by accident. Of the night hours in the washroom, absorbing the necessary intelligence to maintain good enough 'ground' marks, the less said, the better.

We have all things considered, probably been fair to our instructors. We tried to be, honest, fellers! While grateful for the knowledge they have imparted, we have taken liberty to be ultra critical of the quality of instruction. These gentlemen probably are not perturbed by this revelation, for doubtless they have long regarded us as unprincipled morons. However, in the mutually happy atmosphere of our departure, we and they have (D.V!) discovered a common amity which makes us, at any rate, just a little sorry to leave.

Getting down to personalities, throughout the photographs of our members in these pages, you will find visual representations of many of our humble selves.

Mullinger, first (George usually manages to get there when there's kudos about. He got the credit for the Grand Forks trip. And it wasn't him, at all. That was Dead Reckoning Carter.) His aim in life, anyway, is to be a second row at Rugby Union football, all by himself. Speaking of rows, the finest first row we ever avoidea belongs to Roy Mills. Teeth, we mean. Could you miss 'em? In contrast, toothsomely, with him, is 'Fluffy' Helps. Unfortunately, sickness robbed him of the chance to finish the course. When he wasn't flying, he worked for a while marking trips, so now you know how all the rest of us managed to get. The man looking out of the picture with all the aplomb of the 'gen' navigator, is Cyrano de Thistlewood, and we had to get him into a picture he could look straight out of to get the nose in at all.

Well loved by all who contact with him for his ceaseless good cheer and sun-like smile is 'Percy' Goodband. Had we thought to organise properly, we could have put him in charge of our Complaints (Making) Dept. Apart from making complaints, we have mulled over several topics in midnight discussion groups. Star performers on the question 'Should the radio be shut off?' have undoubtedly been Dave King and the wild man from Wales, Phillips (no given name!). They have managed to spoil quite a few manhours of sleep for all of us.

The man with the chin, Geoffrey Denyer, stuck it out well and truly. He went down to Minneapolis for a good time on leave and came back with a bride. Winnipeggers will probably know John Elmitt and Paul Fletcher much better than we do. When they get dressed up like the dummies in Harry Genser's window you can't tell 'em from the natives. How different from those Englishmen abroad, Messrs. Good-

band and Hancock, paragons of propriety both—we wonder.

Harry Tomkinson, an erstwhile breeder of rodents from Otley, Yorkshire, has half cleaned out the stock of Doris Day records held at "The Bay." He developed the ability to lie in bed smoking and read, and change records with one hand without stopping any of the other activity, into a high art. However, he suffered the consequences of one of the fire-cracker battles waged to brighten up this lonely life a little.

Who else is there? The Bridge men, of course,—Pete Cole, Chris Coates, Jack Smith, Roy Mills, Terry Miller, Eric Withers. Sales of 'Oh! Henry' bars will drop now he's gone. George Bridson! We had almost forgotten him, but he came in singing one of his pre-fabricated calypsos about John Shortall. What he finds to sing about in him, we have no idea; we can find nothing to write about him. That would be so of Sandy King, were there not evidence of his wearing the family tartan in and around the town. That surely makes him stand out, if only from the knees down.

Reference to Mike Dowsett is significantly left to the last. He is grateful for the wonderful number of sleeping hours he has attained here, but can't wait to sleep all the way to Montreal and then to London, and then start three weeks sleep while on leave.

So much for our past in Winnipeg. Of the future, we are in no position to warn the enemy where we each may be disporting ourselves to his discomfort, and naturally, we wouldn't if we could. We save such confidential information for the girl friends. (Just ask anyone from the Normal School anything about us you may have the yen to know.)

However, we are imbued with fair confidence that we shall be able to get the measure of any job they like to put us to. That is why we came here, and for the achievement of it, we thank you, the Instructors of 2 Air Navigation School, especially those who taught us.

THE ATOM— *Bomb or Benefit*

By Flight Sergeant J. E. Marsh

THE AUTHOR, has a red face—no not from exertion, but because he didn't fulfil the present day requirements of what is considered popular reading material for the masses.

When I was given this assignment it was with the understanding that it should appeal to the average person and be understood by even non-technical personnel. With this thought in mind, I personnally went into the crowd with a draft copy of the first article to find out the reactions of the "man in the street." What a reaction! The first person to read the draft copy stuck with it for two paragraphs, then looked up with a bewildered expression and said, "This article has no sex in it," unquote, and without any further explanation left me standing there complete with article and a **stunned** feeling of having completely failed in my first literary venture.

The second, third and fourth interview with the "MITS" did nothing to allay the suspicion that I would never (if I continued writing without sex) compose a best seller.

It may be rather difficult to introduce sex into this article, and beyond the fact that the atoms, particularly the ones at the top and bottom of the periodic chart are unpredictable in their habits they are I'm afraid sexless.

First then—a review of the last article so that everyone may start from scratch:

Remember

1. Matter has more space than substance.

2. Compounds may be broken down into basic constituents called "elements" and elements further broken down chemically to a unit of the element, the "atom."

3. There are over 100 of these elements some natural, i.e. Hydrogen, Gold, Iron, some man made, i.e. Plutonium.

They are arranged in a periodic chart according to their increasing protonic weight.

Hydrogen (1 proton) the lightest.

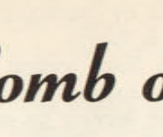
Oxygen (16 protons) basis for computing all other elements.

Uranium (92 protons) the heaviest of the naturally occurring elements.

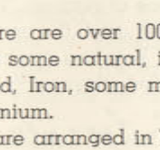
Atoms of the same element may have different atomic weight, depending upon the number of neutrons in the neucleus, these are called isotope.

Some elements may have as many as 10 isotopes, each with a different number of neutrons, therefore a different atomic weight.

To illustrate.



Normal Hydrogen atom.
1 proton (positive charge)
1 electron (negative charge)



Atomic Symbol—

1-"A" number-atomic weight of 1
H—Chemical symbol
1-"Z" number (number of protons, hence number of electrons).

"Heavy" Hydrogen Atom.

1 proton ⊕
1 electron ⊖
1 neutron O neutral charge same weight as proton (1)

Atomic Symbol—

$_1H^2$—1 proton 1 neutron
—1 proton.
atomic weight of 2

We can therefore say that there are two isotopes of hydrogen.

There are two phenomena possible in the atom (or isotope) Ionization—Separation of the neucleus (+) from the electrons (—) in which case the neucleus became a positive ion and the electron became negative ions. While in this ionized state they are called an ion pair (more about this phenomena which we come to the methods of detecting radiation).

Radiation — The disintegration of the atom.

There are two types of Radiation:

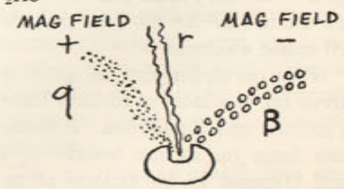
(a) Induced radiation (which will be shown later in the article).

(b) Natural radiation—which occurs in elements that are naturally radioactive.

Radium is one of these elements; it changes from radium to lead actually giving off three types of radiation during the process.

The Beta particle are attracted to the positive (+) side of an electrical field and were found to be a stream of electrons. (—)

The Alpha (+) particles are attracted to the negative side of an electric field and were found to be positively charged helium atoms. $_2He^4$



The Gamma rays are simply very short x rays.

The intensity of these radiations depend on the size of the piece of radium, gradually decreasing as more and more Radium is transmuted to lead. It is because of this decreasing intensity that the rate of decay must be computed in half-life. The half-life of a radioactive material is the time required to change ½ of the element to another element in the case of Radium, ½ of the piece will change to lead in 1,600 years.

It's something like trying to compute the time, it will take a frog (female that is) to cross the road, if at each jump he (excuse me) she hops ½ the distance the first time, then ½ of the remaining distance the second time, then ½ of the remaining distance the third time and so on ad infinitum, as you can see the poor frustrated female will never get across, no matter what the width of the road was, that she started to cross. So it is with Radium, no matter what the dimensions of the original piece were it never radiates it last alpha, beta, or gamma.

To give you some idea of the penetrating powers of each of the radiations:

Alpha particles can be stopped by ordinary paper.

Beta particles can be stopped by ⅛ aluminum.

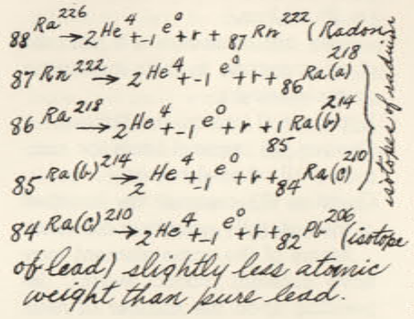
Gamma rays cannot be stopped by anything.

Incidentally, the shielding necessary to effectively reduce the intensity of the radioactive Beta and Gamma is computed in half-thickness — Remember the frog — if it jumps ½ the — Oh never mind!

The transmutation of radium can be shown by nuclear formulae. The nuclear symbol for radium is $_{88}Ra^{226}$ for the Alpha particle (helium atom) $_{2}He^{4}$ for the Beta particle (Hi speed electron) -1^{e0}

When an alpha particle, ($_{2}He^{4}$) is given off, the atom of radium loses 2 protons and 2 neutrons. It therefore loses an atomic weight of 4 and changes to an isotope of an element having a nuclear formulae $_{86}x^{222}$ which by consulting the periodic table is Radon.

When a Beta particle -1^{e0} is given off it loses an electron from the neutron leaving an extra proton which changes it to an element of the same atomic weight x^{222} but with 1 more proton $_{87}Ra^{222}$ which is an isotope of Radium. To reduce the steps required, the emissions of Alpha and Beta are combined and simply added algebraicly so:



Which is an isotope of lead having a slightly less atomic weight than normal lead.

There will be more of this when we get to nuclear fission or induced radiation.

Here are a few more interesting facts about radium before we leave it. It is obtained from pitchblend, mined to a great extent in Canada. The Gamma rays, very high penetrating power have relatively little effect on living tissue, and are nothing more than very short ex-ray.

The Alpha particles are very heavy, have very little penetrating power and consequently are considered harmless.

The Beta particles—hi speed electron are exactly like the electrons used in such instruments as Cathode Ray Tubes, being put to such good use in Radar and television.

The reason we have spent so much time on radium is that the emissions from radium, like the radiation from any radioactive substance have a very definite effect on lifting tissue the beneficial properties of these radiation are that they will destroy deceased tissue more quickly than healthy tissue, and under controlled conditions are used quite extensively in the treatment of certain types of cancer.

So much for radium. Now let us compare the relationship between mass and energy.

The charge on the nucleus is entirely due to the protons (÷) in it. It's mass and therefore it's atomic weight is determined by the combined mass of it's protons and neutrons.

The picture of the structure of the atom is pretty well complete, (See the Heavy Hydrogen atom). However there are still a few questions to be answered. Radioactivity was still not explained. Why did the Radium atom break down and what was the source of the energy liberated? Also how could so many positive charges exist so close together within the nucleus? Every atom with more than one positive charge also contained at least an equal number of neutrons and usually a greater number especially with the larger atoms. Perhaps the neutrons served to bind the positive charges together.

Since atoms are made up only of protons, neutrons and electrons we would expect that the atomic weight of each pure isotope should be a whole number multiple of hydrogen. However, accurate determination of atomic weight showed that this was not so. Taking the atomic weight of Oxygen to be 16.0000 and using this as a yardstick the mass of helium nucleus is 4.00280.

Mass of 2 neutrons	— 2.01786
Mass of 2 protons	— 2.01516
Total	— 4.03302
Mass of Helium Nucleus	— 4.00280
Difference	0.03022

Thus the mass of the Helium nucleus is less than the sum of its parts. In the formation of Helium from its components, 0.03022 units of mass remain to be accounted for.

In 1905 Einstein had suggested in his theory of relativity that energy and mass are different aspects of the same cosmic stuff and further that they were related.

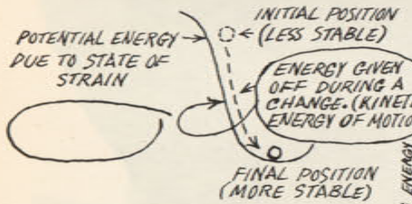
He expressed this relationship by the formula:

$E\text{-}Mc^2$ Where M = mass of a body in grams.

C^2 3x 10^{10} ams/Sec (velocity of light) and E Associated energy in ergs.

Using this equation to convert our apparent mass loss of 0.03022 units in the formation of Helium we see first that the mass 10 is approximately ¾ of 1 per cent of the total Helium mass. In one g of Helium this loss is 0.70075 gram. Multiplying this by C^2 gives us over 650 million billion ergs of energy or about 200000 kilowatt hours. This is the energy given off when ½ gram each of protons and neutrons unite to form 1 gram of helium. Stick with me, this won't take long.

When a stone rolls down a mountain into a valley its final situation is more stable than its initial one and during the change, energy is given out.



Generally speaking, when a system emits energy during a change it is more stable after the emission than before. This statement is also true for chemical changes and even for nuclear changes. The helium atom is more stable than the hydrogen atom. One way to judge the relative stability of a system is to determine the energy necessary to change it to some other state — Read on — the sexy part comes later.

The loss of mass that occurs in the formation of a nucleus from protons and neutrons is spoken of as its mass defect. The binding energy per particle in the nucleus is the total binding energy of the atom divided by the number of particles in the nucleus.

The binding energy per particle for each elements is obtained by substracting its atomic weight from the sum of the weights of the protons and neutrons in the nucleus and then dividing the difference by the numbers of particles in the nucleus. See! ! It's simple.

Taking Krypton as an example:

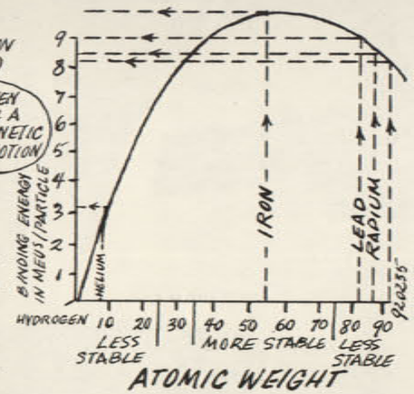
Krypton has 36 protons and 78-36—42 neutrons.
Mass of protons - 36 x 1.0081=36.2923 mass units
Mass of neutrons - 42 x 1.0089=42.3750 mass units

78.6673 mass units
Atomic weight of Krypton =77.9450 mass units
Mass defect = .7223 mass units

Now, one mass unit is equivalent to 931 Mev of energy using $E = mc^2$ therefore the binding energy = .7223 X 931 = 672 Mev. and the binding energy per particle = 672

78 = 8.6 Mev.

The binding energy per particle is different for each element and follows a regular pattern as shown in the graph.



The most stable elements lie in the centre of the periodic table, the ones at either ends being less stable. Also if it were possible to convert the atoms of elements with either high or low atomic numbers into atoms whose weights are near the centre of the table we would be changing from a less stable to a more stable form and energy should be given up on the process. It has been shown that the energy coming to us from the sun and stars is emitted during the formation of Helium from hydrogen. The other method of producing energy occurs naturally here on earth in the radioactive elements. Radium spontaneously breaks down into radon and lead. These have larger binding energies than the radium so that the energy is emitted in the charge to the more stable elements. This change is spontaneous and occurs slowly. Nothing we can do to the radium will speed up the process to give up the energy more quickly. However since 1939 we have learned another method of releasing energy by changing the binding energy from the heavy to the lighter elements. It consists in breaking up the uranium nuclei, resulting in the emission of vast amounts of energy, and forming elements with higher binding energies.

NO. 1 AIR MOVEMENTS DETACHMENT—

By Cpl. R. M. THORMINGTON

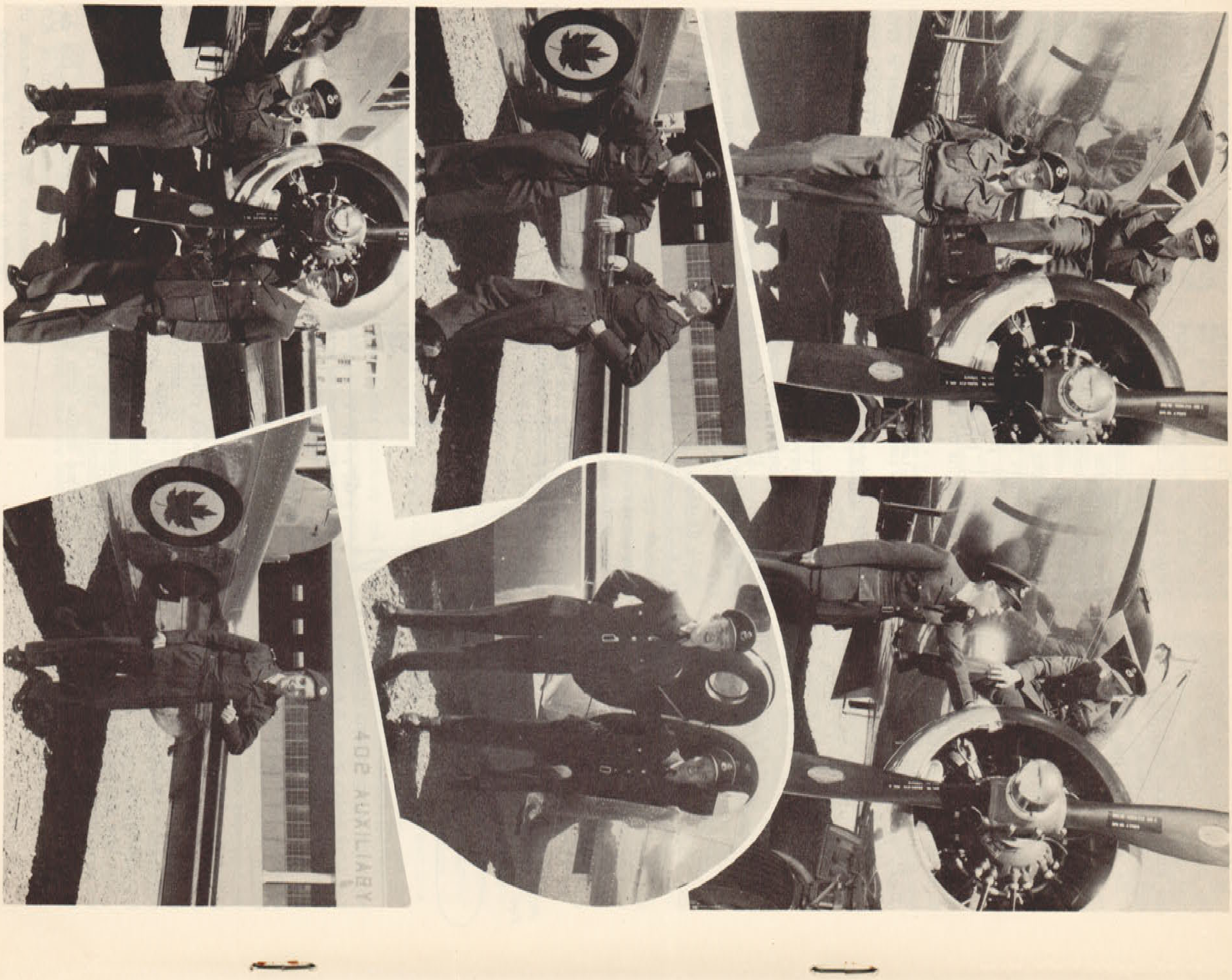
WITH THE BIRTH of a new publication "VOXAIR" at this station, No. 1 Air Movements Detachment has been asked to step forward and say a few words.

Commonly referred to as "Air Movements," we are a detachment of No. 1 Air Movements Unit located at Edmonton, Alberta.

Our Air Movements Officer at this detachment is F/L Harry Chekaluck, a pilot, formerly of 435 Transport Squadron, Edmonton, who found himself transferred to Winnipeg one year ago to "fly a desk" for a change.

To outline briefly the duties of this detachment, we are responsible for the manifesting of all passengers and freight, and the computation of the weight and balance clearance on all Air Transport Command aircraft passing through this station.

On an average month this detachment handles a total of 650 passengers and 23,700 pounds of freight in and out of Winnipeg.



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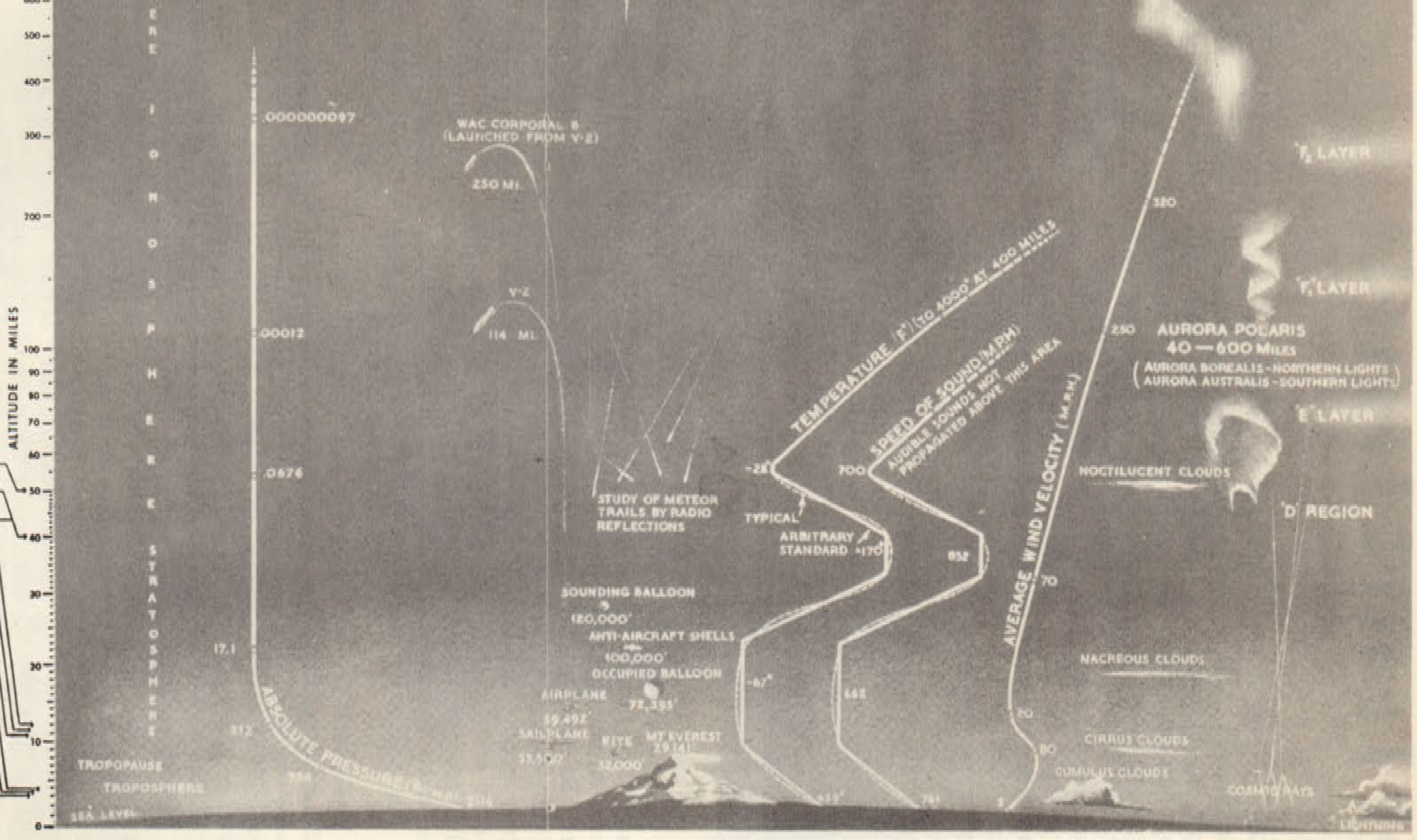


Characteristics of the Earth's Atmosphere

A KNOWLEDGE of the earth's atmospheric characteristics is important to air transportation as well as to weather prediction, radio communications, and the understanding of various phenomena that occur in our every-day lives. Although there are many unsolved problems, the advances during the past decade in this field have been outstanding.

The earth's atmosphere is currently defined as consisting of four concentric gaseous layers; the troposphere, stratosphere, ionosphere, and exosphere. These layers provide a gradual transition from the atmospheric characteristics as we know them at sea level, to the exosphere which merges with interplanetary space. The weight of this atmosphere is approximately one-millionth of the weight of the earth, and a square foot column extending vertically through the atmosphere weighs approximately one ton. Of this atmospheric weight about three-quarters is concentrated in the troposphere, slightly less than one-quarter in the stratosphere, one three-thousandth in the ionosphere, and one one-hundred-thousand-millionth in the exosphere.

Atmospheric characteristics vary with time of day, latitude, and season of the year. Consequently, only representative average values are shown.

AVERAGE SIZE OF METEORITES IS THAT OF A PEA

TWILIGHT LIMIT. FIRST MAGNITUDE STARS VISIBLE DIRECTLY OVERHEAD WHEN SUN SETS.

OZONE LAYER. CONCENTRATION OF OZONE IN THIS REGION ABSORBS LARGE PART OF SUN'S ULTRA VIOLET RADIATION.

BLOOD AT NORMAL BODY TEMPERATURE (98 F.) BOILS AT THIS PRESSURE ALTITUDE (63,000 FEET)

RECIPROCATING ENGINE POWER OUTPUT FALLS TO ZERO BETWEEN 55,000 AND 60,000 FEET

WATER VAPOR IN BODY BOILS AT PRESSURE ALTITUDE OF 55,000 FEET CAUSING SKIN TO INFLATE LIKE BALLOON

HIGHEST ALTITUDE AT WHICH ATMOSPHERIC OXYGEN IS ABLE TO SUSTAIN LIFE DEPENDS ON PHYSICAL CONDITION AND DURATION OF STAY (15,000 TO 20,000 FEET)

HIGHEST KNOWN COMMUNITY OF HUMAN BEINGS, ANDES MOUNTAINS, SOUTH AMERICA (18,000 FEET)

PAIN NOT NOTICED BY UNACCLIMATED MAN AT GREATER PRESSURE ALTITUDE THAN 16,000 FEET

LEVELS. The first layer of the earth's atmosphere, the troposphere, extends from sea level to about 35,000 ft. at middle latitudes, but varies from 54,000 ft. at the equator to 28,000 ft. at the poles. This densest layer is approximately four-fifths molecular nitrogen and one-fifth molecular oxygen. The tropopause is the boundary between the troposphere and the stratosphere; the stratosphere extends 60 to 70 miles.

ABSOLUTE PRESSURE. As distinguished from other characteristics of the earth's atmosphere, the vertical pressure distribution behaves in a regular manner and constantly decreases with altitude. At the outermost edge of the troposphere, the pressure has fallen to one quarter of its sea level value; at the limit of the stratosphere it has fallen to one three-thousandth of the sea level value.

TEMPERATURE. The temperature in the troposphere steadily decreases with increasing altitude. In the stratosphere, the temperature is at first constant, then increases to a maximum in the ozone layer. The temperature then starts to decrease again and reaches freezing temperatures just inside the ionosphere at the noctilucent cloud level, then increases to a maximum of about 4,000 (F.) in the exosphere.

SPEED OF SOUND. The speed of sound is proportional to the square root of the absolute temperature. However, as the distance between the molecules increases at the high altitudes, sound waves of the frequency corresponding to a piano scale are damped out in very short distances. The maximum altitude at which a given sound wave can be propagated increases as the sound wave length increases.

PREPARED BY ENGINEERING DEPARTMENT
DOUGLAS AIRCRAFT COMPANY, INC.
EL SEGUNDO PLANT, EL SEGUNDO, CALIFORNIA.

Leave! Leave! Leave!

By Cpl. E. H. DAY

LEAVE—The by-word of the Air Force—the foremost thought of its members—the most sought after period of pleasure. And certainly everybody deems it a necessity and an entitlement. Yes, an entitlement but remember, always, leave and pass may be withheld only by reason of the exigencies of the service, and that an officer or airman on leave or pass may be recalled at any time.

With this in mind you have applied for annual leave, a full month, thirty full days to wile away the time. You bear the morbid glamour of a few dens of iniquity or trespass with footpaths of Broadway, St. Catherines or Yonge, Barrington, Bank or Granville.

Bear in mind that with your thirty days leave you are entitled to a maximum of eight days travelling time or as many days as the leave may warrant. So here you find yourself with thirty-eight days leave and you only applied for thirty! Just think eight extra days already! And still you scream, "There should be more leave." Read on McDuff, this is just the beginning.

You want Good Friday off? You shall have it. Oh, so you also want Easter Monday—okay that too, so says the book. How about Victoria Day—that also you shall have, as well as Dominion Day, Labor Day and Armistice Day. Well, we finally got around to Christmas Day and what happens then? Well Christmas Day is definitely a holiday—including another two days inclusive. This also applies if you happen to take New Year's leave. Remember here that you are not entitled to both—only one or the other with the exception that you may take annual leave over both Christmas and New Year's in which case you will not be granted the extra two days.

So far do you realize the number of days leave you have had over the period of a year? Count 'em up. That's right, forty-seven days. That is seventeen days more than perhaps you fully realized.

Let us go further and include the week-ends. Fifty-two of them comprised of fifty-two Sundays and fifty-two Saturdays. Take the fifty-two Sundays and add them to the forty-seven days so far and what have you in leave (holidays) McGuff? Right, ninety-nine days! Suppose yours is a five-day week continuously — then add another fifty-two days more, a total of 151 days off. Okey, okey, McGill, you only work a five and a half day week. In that case add another 26 days to your 99 days and you still have 125 days off in a year.

With all this the birthday of the reigning sovereign or the day fixed by proclamation for the celebration thereof is a holiday. Inclusively, with this article, any day set or appointed by proclamation by the Governor in Council to be observed as a general fast or thanksgiving, or a holiday is another consideration.

Rest assured gentlemen, there are other leaves, some of which are deducted from annual leave which do not affect the number of days minimum leave over a year's period. And, there are some that do. As for an example, there is isolation leave which amounts to seven days for a minimum of 183 consecutive days during which time an airman's place of duty is in a locality designated in order as isolated. Yes, my fine friends, this too is in excess of annual leave.

So there you have it—a brief outline of a year's leaves and holidays and yet you scream, "MORE LEAVE," even though it may be a cry well known, "buckshee leave!" Just sit down and try to think of where you can get a minimum of 125 days leave, more than a third of a year, and still draw full pay.

2402 AIR CONTROL AND WARNING UNIT (AUX)

F/L R. A. BASSON

THIS UNIT was established on the 1st October, 1950. The Commanding Officer, S/L F. D. Searles, was appointed on 1st December of that year and on 6th March F/O now F/L R. A. Basson arrived as O/C Support. By mid-June the Unit moved to the old NRC building and began training in earnest.

The function of the Unit is to provide Air Control and Warning facilities. This is accomplished by correlating information from many sources; the prime source of information is their own Radar Convoy. The Unit attended summer camp at Abbotsford, working closely with 2442 AC&WU of Vancouver and gained much valuable experience.

On return from camp, training was resumed in the fall and culminated in a major exercise "Operation Strike" on 21st January, 1952. The objective of this exercise was the Rolling Mills at Selkirk. The defending force was the Winnipeg Reserve Squadron 402. The "enemy" of course, was "badly mauled despite the protection of the Calgary fighter cover."

Training is provided by the Unit in all relevant trades; Comm and Radar Technicians, Radio Ops, Teletype Ops, Comm Op and Fighter Control Operating. Classes are held on Tuesday and Thursday evenings with practical work and further classes on Sundays. Attendance has been good and many auxiliary personnel have obtained their groupings despite the short time the Unit has been operating.

An amateur Radio Club has been just recently formed and is becoming increasingly active. The Call Signs are VE4GY and CHP55. A 20 metre beam has just been installed and the Unit technicians are busy ironing out the "bugs" although results have been encouraging.

Social life on the unit has not been ignored however, and the 62 Club was formed to take care of that. The purpose of this Club is to provide "Do's" for its members. It is suspected, however, that the main purpose of these "Do's" is to appease the "better halves" who may resent being left home while the reservist attends parades. At the moment a combined Reserve frolic is being planned and will be held in the near future.

This year's summer camp will be at Watson Lake in the Yukon and a good attendance is expected. Great plans are made and preparations at 2402 are almost completed. This year, for the first time, the Unit is on its own and the determination to make good is strong. We know they will!

Sports SpotLight

By Cpl. J. SPEERS

BADMINTON

Sport activities on the station got off to a booming start in 1952 with the RCAF taking the grand aggregate total to win the Winnipeg Inter-Service Badminton Championship by a comfortable margin in most events. Congratulations to each and every member of the team for a show well done.

HOCKEY

The hockey team did well, ending in a third place deadlock with the Army in the Inter-service League. They bowed out in the playoffs in a very close battle with the Navy, who, incidentally went on to capture the league laurels. Although the RCAF did not top the league, they proved that they were at the top of the "Never Say Die Department." Next year they will be the team to watch.

BASKETBALL

With no official Inter-service League operating, a flight cadet club was formed and made a very impressive record with a scattering of N.A.T.O. representatives. These teams were very efficient machines from the viewpoint of team play. They made life quite uneasy for any opponent when in striking distance, missing very few opportunities to score through their speed and accuracy in shooting. Their main course of attack was team work and supplied the camp with a few thrilling nights of entertainment.

BOWLING

A very successful season was enjoyed by the Inter-station Bowling League. Honours went to A.N.S. Servicing by a very close margin over the Accounts & Mess Hall group. The roll-off was a three game total with the victors obtaining a narrow margin of 10 points to take the championship.

CURLING

The RCAF Curling Representatives ended in a deadlock with the Army in the Inter-service Curling League. The final rock decided the match in favour of the Army. Generally speaking the season was quite successful considering that there were many comparatively new curlers in the local club.

MEDICAL MEMO

20 June, 52

All Personnel

SUMMER COMFORT, Assurance of

1. Now that summer is practically upon us, the station will be divided into two groups—those who will endeavour to bronze their torsos with the aid of Old Sol in their spare time, and those who will furtively seek the shade of the nearest tree to evade his penetrating rays.

2. For those who fall under the former category the following information will be well worth noting:

(a) Sunburn is classified as "self-inflicted injury."

(b) Preventive measures such as oiling the skin prior to exposure, and a gradual increase in exposure times will reduce the chances of burning.

3. Our shade-loving f r i e n d s should be forewarned of the hazards that lurk in the woods in this locality:

(a) Wood ticks.

(b) Poison ivy.

4. Frankly, the place is loaded. For reasons better known by entomologists, the tick favours the Scrub Oak as its home and it is this variety of tree that offers the most readily acceptable shade in the station area.

5. When infested by these ticks, if the individual is in the close proximity of the MIR, he should go there i m m e d i a t e l y for disinfestation measures. If this is not practicable, he should bear in mind that the head of the tick must be removed. It is not a satisfactory method to simply brush off the tick as the head may be severed and left in the skin. If this happens, it keeps burrowing deeper into the underlying tissues with the result that severe infection is apt to develop.

6. A simple method for removal is the application of the lighted end of a cigarette to a distance of about half an inch from the body of the tick. This method causes the tick to remove its head from the skin at which time it can be brushed off.

Poison Ivy abounds plentifully in this district and if one chances to come in contact with it, he should immediately report to the Medical Officer for treatments as the condition spreads if not treated correctly.

(RF HARDY) Sgt.
Medical Inspection Room.

Principles of Jet Propulsion

by F/L A. H. Rewakowsky

ABOUT THE AUTHOR—Flight Lieutenant A. H. Rewakowsky is a Flight Commander in the A.N.S. Flying Wing. He started his air force career in 1946 when he enlisted in the RCAF as an aero engine technician, later remustering to an instrument technician and finally in 1948 took his pilot training at Centralia. He was stationed at Summerside as a Staff Pilot before being transferred to Winnipeg in August 1951. He is such an ardent hobbyist that he has been appointed as O/C Hobby Shop since his arrival here.

SINCE THE CLOSE of the last war there have been many technical refinements incorporated into our modern aircraft. None, however, have proved to be quite as revolutionary or far reaching as the gas turbine system of jet propulsion. Newspaper headlines herald the coming jet age and report, almost daily, the setting of some new speed or distance record.

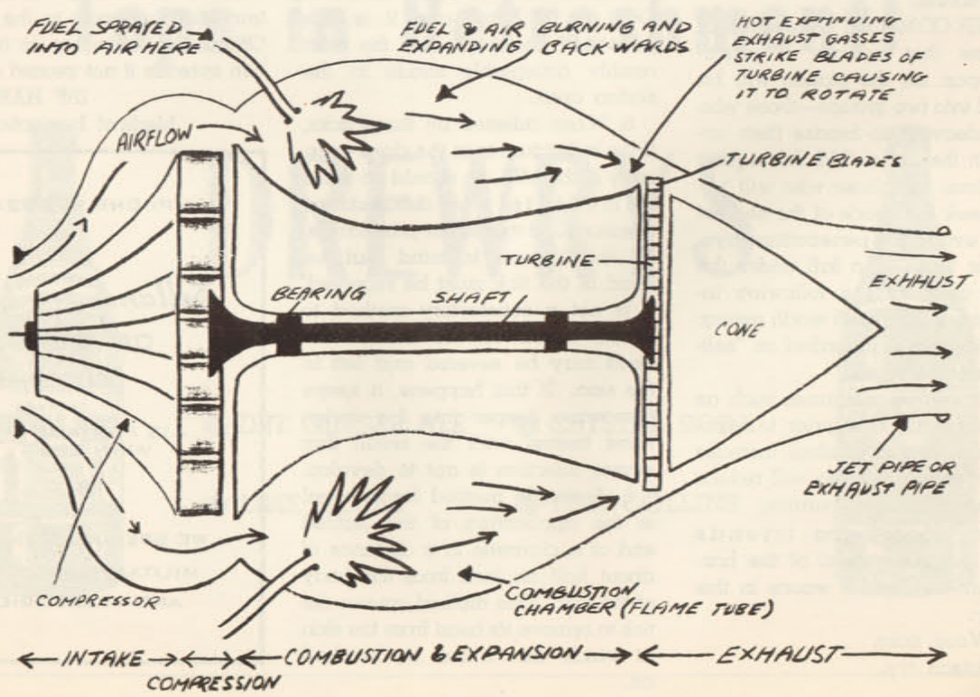
With all the talk of jet propulsion and its accompanying technical phraseology, there are perhaps many who are not too familiar with the basic theory or principle behind it. This article is directed to these people.

Technically, the conventional aircraft (piston engine driving a propellor) is a form of jet propulsion. It differs from the recently developed gas turbine or jet engine in the volume of air involved. The piston engine-propellor combination derives its thrust from the propellor. The propellor pushes a large volume of air backwards at a relatively slow speed and in so doing moves the aircraft forward. Jet propulsion on the other hand, ejects or moves a small stream of air backwards at a very high speed, providing the same net result—forward movement of the aircraft. The methods of producing the jet of moving air are the basic differences between the two types of power plants.

In the jet engine, air is compressed to expand rapidly thereby producing exhaust gases. Just how this is accomplished can be seen in the diagram below. Air is drawn into the front of the engine by

(Insert Diagram)

the compressor (or fan). The compressor squeezes this air and pushes it into the combustion chamber. Here, fuel is sprayed into the stream of air and the mixture burns. This burning raises the temperature of the air and causes it to expand. Since there is no other place for this air to go, it rushes out the back of the combustion chamber and strikes the curved blades of the turbine. This causes the turbine to rotate working on the principle of a water wheel. Since this turbine is mounted on the same shaft as the compressor, it causes the compressor to rotate. The rotation of the compressor draws in more air—a sort of vicious circle.



After passing the turbine, the high speed exhaust gases continue out the exhaust pipe. This high speed stream of gases escaping out the back of the engine gives the engine a push forward, thereby moving the aircraft.

To start the jet engine, an electric starting motor turns the compressor, fuel is sprayed into the air and a spark plug fires the mixture. After this, no more spark is required as the fuel is sprayed constantly and burning is continuous. The rushing exhaust gases rotate the turbine which in turn rotates the compressor. A jet engine can be compared to a blow torch—once started it burns continuously until the fuel is shut off. The hand pump used to supply the pressure in the blow torch is replaced by a rotating compressor or fan in the jet engine. The power to drive the compressor is supplied by the turbine.

From the above it can be seen that a jet engine is much simpler and has fewer parts than a piston engine. The compressor and turbine are the only moving parts. They are mounted on a common shaft and rotate on two or three bearings. Because of this, there is absolutely no vibration—a very desirable characteristic. Another advantage is that power is supplied continuously, not in a series of pushes or impulses as in the piston engine. The absence of many moving parts such as valves, timing gears, etc., makes maintenance much simpler. Also, a jet engine does not require high octane gasoline. It will burn kerosene, fuel oil, etc. Besides cutting down the fire hazard that is present with high octane gasoline, the supply problem is simplified. As the recent oil strike in the U.S.A. proved, we would be almost helpless if our foreign supplies were cut off.

The one main fault with the jet engine is its high fuel consumption. This is being investigated and may soon be cut down.

So it appears that the "Jet Age" is here. Perhaps in the near future we may take the schid run at noon in Halifax and arrive in Vancouver in time for tea.

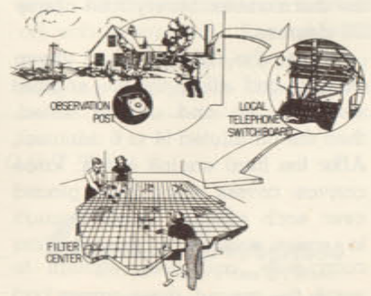
Ground Observation Corps

CONGRATULATIONS to VOXAIR on a very fine first issue. If, as is frequently remarked, experience and practice make for perfection, then we in a short time, should have a publication equal to any in the service to-day.

In our first article it was mentioned that the purpose of the Ground Observer Corps was to act as a supplement to the existing radar warding screen. Further to this, we would like to explain some of the shortcomings of radar, and why an observer corps is necessary in the air defense of our country.

Adverse weather conditions and hilly country, frequently limit the accuracy of radar. It was for this reason that allied fighter - bombers were able to cross the shores of Holland "under" the radar of the German defenders, and for the same reason that the multi-thousand manned Royal Observer Corps was formed in the U.K. during the last war. Here, in the event of war, the spotters would not only report aircraft which might be on their way to a bombing raid of Canada's industrial cities, but they would also play an important part in preventing the escape of bombers, which, because they have been damaged in a raid, try to fly low on their return and thus avoid being brought down.

When the G/OBC is completely organized in the Province of Manitoba, there will be a chain of observer posts set up approximately eight miles apart. The information sent from these posts will terminate



at the Winnipeg operations room or Filter centre, and then be passed to the appropriate R.C.A.F. Control centre. For the past few months we have been selecting suitable, responsible men throughout the Province, to act in the capacity of Regional Supervisors. These men have been allocated specific areas in which they will be responsible for the actual setting up of the Corps. In the outlying and northern part of the Province, various allied organizations have offered us the use of their existing communications facilities. A few of these are: Air Force Amateur Radio System, Hudson's Bay, CPR and CNR, Forestry Department, and Department of Game and Fisheries.

At the present time the Corps is approximately thirty per cent organized in the Province of Manitoba. It is hoped by us, to have, at least a skeleton reporting network set up in the very near future. However, the final activation of this network is still dependent on the selection and completion of a Filter centre in Winnipeg.

Bush Flying in Northern Manitoba

By F/O E. G. McNARRY

AT THE END of World War II I was one of the large number of veterans who decided to return to the land. Under the VLA scheme, I acquired a quarter section in the Foxwarren area of Manitoba, which I farmed from the spring of 1946 to the spring of 1950. By the end of this period I had been forced to the conclusion that the venture was proving none too profitable. This fact, combined with the still strong call of the wild blue yonder which had led me to enlist in the RCAF during the war, resulted in my decision to return to flying as a career.

My first thought, because of the crisis then developing in Korea, was to return to the RCAF as a pilot. Aircrew age limits at the time, however, prevented this. Instead I took a short civilian refresher course with the Winnipeg Flying Club, involving some ten hours of light aircraft time. In conjunction with this I was fortunate enough to be given a good deal of Buckshee ground instruction by several experienced friends associated with the club and with Winnipeg DOT. By Christmas of 1950 I had been granted a commercial flying licence, and set out to find a suitable employer.

This entailed some research, in the form of interviews with several Manitoba companies—Central Northern Airways (Winnipeg), Lamb Airways (The Pas), etc.; as well as correspondence with crop-dusting outfits in the U.S.A. Since my experience was limited in the type of flying required, the results were at first d i s c o u r a g i n g. However, through the cooperation of previous contacts I was offered a place with the ECO Exploration Company of Winnipeg (Now Riverton Airways).

This company's winter operations at that time consisted of air freighting supplies to various HBC posts in Northern Manitoba. On return trips their aircraft carried fresh whitefish, pickerel, trout, etc., back to Riverton, whence it was trucked to Winnipeg. During summer months the main occupation was the staking of mining claims in Manitoba's rich northern wilderness, and the transport of ore sampling equipment to various finds in this region.

I worked with this company from January to March, 1951, and over this period managed to build up a fair amount of winter bush time over the triangular area enclosed by Riverton, God's Lake, and Red Sucker Lake. Below I have attempted to outline some of the more salient points of winter bush operations.

Preparation for a flight over bush territory involves a considerable amount of planning and pre-flight preparation of the aircraft by the pilot. Work begins the night before the trip. The load consists of supplies for northern HBC posts—flour, sugar, tea and coffee, plus a wide variety of canned goods. Any foods not subject to frost damage were loaded in the evening. Refuelling at the Riverton base was comparatively simple, the fuel being filtered from an electrically operated gas pump. Oil was kept in a heated shack. Refueling could at times be a very cold operation, especially when the temperature dropped to around -40 degrees, with a breeze. During my first six weeks with ECO, the thermometer barely rose above -30 degrees.

When the aircraft had been gassed and oiled up the engines were run up and ground tested, then the oil diluted (4 to 6 minutes). After the final engine check, large canvas covers were then placed over each engine. Large enough to cover engines and propellors completely, and deep enough to reach the ground, these covers had to be fastened securely for the night, to prevent them blowing off. Next the wing covers were put on, their purpose being to prevent the formation of frost on the wings, which could constitute a serious hazard on take-off. This could be a tricky proposition with a strong wind blowing, sometimes requiring four men.

After bedding down the aircraft for the night, we tuned in to local Winnipeg broadcasting stations for the regional forecasts. These very generalized outlooks comprised our sole Met information from any official source. Maps of the route to be flown were studied, and main pinpoints marked. Compass headings were written on the map. Flight plans were unknown to us on these operations, but it was company policy that pilots were to adhere to a predetermined track. If adverse weather conditions were encountered en route, aircraft were to return to base or to make an emergency landing as near track as possible. Though all trips were nominally VFR, we often had to fly through cloud or below it at tree top level.

Courtesy of Al Nelson, Riverton Airway

Morning preparations began with breakfast between five and six A.M. Then each pilot and his helper began preparing their aircraft for flight. Engines were warmed up by means of a "blowpot," a large blowtorch with a vertical nozzle and a one gallon fuel tank. This blowpot was lighted, the lower part of the engine cover loosened to form a tent, and the heat directed onto the engine for a period of from 20 to 30 minutes before it could be started. One-half to three-quarters of an hour run-up was necessary after starting, to bring oil and cylinder head temperatures to operating levels and to evaporate the gasoline used in dilution the night before. During warm-up the helper made a final check on load and emergency equipment. It was his responsibility to tie down cargo and check that fuel pump and strainer, emergency rations, rifle and cartridges, engine and wing covers, blowpots, and sleeping bags were on board.

After takeoff a final visual check was made on the weather. Knowing that his own safety as well as that of the aircraft depended on his judgment in evaluating weather by a study of sky conditions, the northern pilot soon becomes proficient in practical meterology.

Navigation consisted of straight track crawl methods and direct map reading. Visual checks of pinpoints previously marked on the map for quick reference are used extensively, for mental ground speed checks and estimates of fuel consumption. In the northern lake area during winter it is very easy to confuse snow-covered marsh and swamp with snow-covered lakes, which can lead to some very embarassing moments for the map reader. When adverse weather was encountered, the pilot had to decide whether to press on, return to base, or make an emergency landing and wait for the weather to clear. The first two possibilities need no discussion, but making an emergency landing is another matter. Several factors governed whether it was to be successful or not. First a suitable landing area had to be selected—a lake or a river, preferably a lake. A low run over the area had to be made and a landing path chosen, drift checked, surface conditions noted (snow drifts, loose snow, etc.). If the landing area chosen is a river, then additional checks must be made for thin ice or open water. A common rule for selecting a landing area on a river was to look for moose or caribou tracks, since as a rule these animals instinctively will cross only on solid ice.

Courtesy of Al Nelson, Riverton Airway

Local fog was another winter phenomenum encountered. Over fast flowing open water in extremely cold weather low fog is very common. One peculiar thing I noticed was that across Loon Straits on Lake Winnipeg there was usually a band of fog one to two miles wide and up to 2,000 feet in height, every morning and evening.

We carried a lunch of sandwiches and coffee on every trip, which we ate en route.

As an example of a typical landing area we'll take the base at Island Lake. Here there were three choices for the approach. One was between two small islands and was usually the smoothest due to the sheltering effect of the islands. Another was over the HBC post and heading toward the lake center, the third a strip just offshore from the post. All three strips were marked off with evergreens. A good wind check could normally be made by studying the smoke from cabin chimneys. The wind check was very important — the aircraft were always loaded at least to capacity and sometimes beyond; a landing made with even slight drift could seriously damage ski equipment and Oleo legs. A visual check on approach was also necessary. Fishermen occasionally strung nets under the ice leaving holes and mounds of snow and ice or even fish poles as net markers. Tractor train operators have been known to plow trails across landing areas leaving ridges of snow which could be very dangerous.

One of the first things to be done after a successful landing at a camp was to ascertain the approximate weight of the fish to be carried on the return trip. The aircraft was then refuelled with the amount necessary to return to base plus 20 or 30 minutes extra. Occasionally the payload was so heavy that only enough fuel to reach the nearest fuel cache on the return leg could be carried. These fuel caches were also very welcome when unforseen headwinds were encountered on a trip.

The arrival at base was often at dusk and sometimes at night. There were no marker or runway lights for night landings and the pilot relied solely on his judgment and knowledge of the landing strips. During the final part of the approach height comparison with surrounding objects was very useful. Landing lights were of little or no use because of the reflection from snow-covered landing strips.

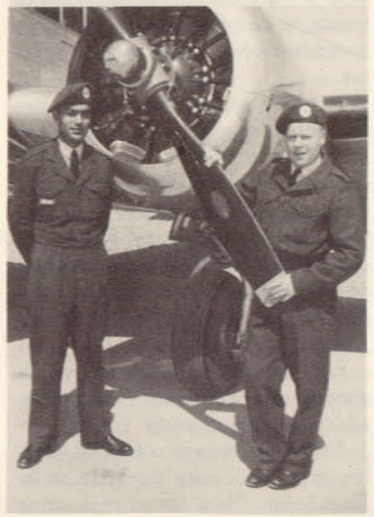
Preparation for the next day's trip began on arrival back at base.

(*Continued on page 22*)

The pilot's reply to the questions of how things went on the trip was usually a non-committal "uneventful."

The life of a bush pilot is a hardy one; he has a love for his aircraft which the outsider finds hard to understand. He lives a healthy outdoor life, eats plain but nourishing foods. Pay is secondary in his thoughts—the lure of territory over which he has never flown before leads him on.

A/P.O. MAIN J.
A/P.O. BORE J.



A./P.O. STEWART S.
A/P.O. PROBERT T.V.

A/P.O. ALLEN D.C.
A/P.O. CORKIN T.S.

A/P.O. BROOKS W.G.
A/P.O CAMPBELL D.

A/P.O. TAIT J.
A/P.O. JONES P.

ME Facts . . .

HANDLING the gasoline tenders is another of the many and varied ME Section activities, but for this particular function, it is a combined effort on behalf of hangar personnel and ME. This is a case of the hangar types saying "Give us the tools and we'll finish the job." As a result, ME supplies, services ond controls the tenders and hangar personnel make up the manpower.

When a North Star lands here for refuelling, the call is put through to the ME despatcher and he sets the tender crew on their way. However, if any complaints are to be laid on

ME's Gasolene Tenders—conveying the life blood of the air force.

servicing the aircraft with fuel, Sgt. H. A. Heath, NCO in charge of the Gas Pool, sets matters right.

On such a station as Winnipeg, gasoline servicing is an active project with so many aircraft arriving with gaping, empty tanks to fill. Just to give you some idea of the scope of this vital service, here are a few figures:

In one month, prior to the gasolene strike, a quarter of a million gallons of 90 and 100 octane gasolene were issued.

There are 6 tenders capable of carrying a total of 13,600 gallons. Five tenders have a capacity each of 1500 gallons, one has a capacity of 1300 gallons, one trailer tender has a capacity of 3200 gallons and the other carries 1600.

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