

# WESTERN **R.C.A.F.** AIR COMMAND

## Review

July, 1941

BRITISH COLUMBIA

VANCOUVER ISLAND



# R. C. A. F.

## Western Air Command Review

Managing Editor  
Bertrand Galloway

Associate Editor  
Sq. Ldr. R. M. Wynd



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### R. C. A. F. WESTERN AIR COMMAND REVIEW

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## EDITORIAL . . . . .

### APOLOGIA

In aerial warfare a man's first mistake is sometimes his last; in civilian life there is frequently another chance—an opportunity to cut losses and start again. This edition of the *Western Air Command Review* will suffice to illustrate the point in question. The reasons for non-publication of this magazine for the past four months may or may not be known to you by this time, but in the face of great difficulty, this publication has been rescued from oblivion through the resourcefulness and determination of Sq. Ldr. R. M. Wynd of Victoria. His first orders were to resume publication immediately, to get out an edition as soon as possible. Sq. Ldr. Wynd assured the Editor that

the boys of the Air Force were deeply interested in the continued publication of this their own official magazine. The time was then too short to get in touch with the various stations and training centres in this Command to get their latest news. The magazine was fortunate in having on hand some material which had been sent in previously by the boys and this has been used and that will be of interest to all of you; but, beyond the contributed material this edition has had to be composed of general news items and it is difficult from an editorial chair in Vancouver to know what is going to be most interesting to you. For this reason and to ensure the continued success of your magazine, please write the *Western Air Command Review*, and say frankly what you think of the magazine and what you would like to see in it—and above all, send in material of your own for publication. The way in which a publication such as this can be of most interest to the fighting forces of the Air is if it is made up of stories and items sent in by the members of the R.C.A.F., because you are the men who are making the news and history of our time and no matter in which far-flung outpost you may be stationed your activities and commentaries are of much greater importance than anything fabricated in any Editorial Office. . . . It's all yours!

## ...—V for VICTORY

During the spring of 1941 the British Intelligence Services reported to Headquarters that passive resistance to the Nazis of the occupied countries of Europe was being symbolized by the letter V. This V, symbol of eventual Victory, was being placed by the conquered peoples on the walls and doorways of their beleaguered cities.

Seizing upon this as excellent propaganda, the British encouraged the outbreak of V's and promised further assistance to those who were in this way striving to crawl out from beneath the Nazi heel. Accordingly, the British Broadcasts were arranged to commence with Beethoven's Fifth Symphony, whose opening notes give the V signal.

When the German Army was meeting organized military resistance on the Russian Front the campaign to encourage civil passive resistance was officially launched from London in a B.B.C. broadcast by Col. V. Britton, who declared the campaign officially open at midnight, July 12th. The broadcast was translated into every human tongue and a rash of V's spread over Europe and into the Americas.

The signal has taken every conceivable form and among the first to further the movement has been the Royal Air Force, who flash the V for Victory in their nightly attacks across Denmark, Northern France and the Rhineland and on into Berlin. As long ago as April, during the experimental stages of this campaign, the letter V coupled with the initials R.A.F. have appeared on walls in Brussels. On July 23rd in Los Angeles, Lady Halifax, wife of the British Ambassador to the United States,

smashed a glass wand of oxygen across the propeller hub of a new dive bomber and declared "I christen thee Vengeance, newest V in Britain's campaign for Victory." Although there have already been about 6200 "V" prosecutions in Paris, the invisible V army continues its work, putting V's on the Hotel Imperator at Nimes and on the door of Nazi headquarters near Rouen. French peasants chalk V's on their hands and press them against the backs of the uniform of Nazi soldiers who appear at headquarters "backing" Britain's "V" campaign.

The V for Victory is being flashed, tooted, whistled, written and even laughed—V clubs have been organized throughout the United States, and in this latest propaganda war, in spite of all that Berlin can do or say to prove that it is a Nazi victory sign, we have definitely beaten them to the draw. Symbol of defiance, faith and hope, our belief that modern man cannot and need not be enslaved and that the Nazi regime is doomed beyond redemption. . . . — . . . — . . . —

## Marine Power for the "AIR"

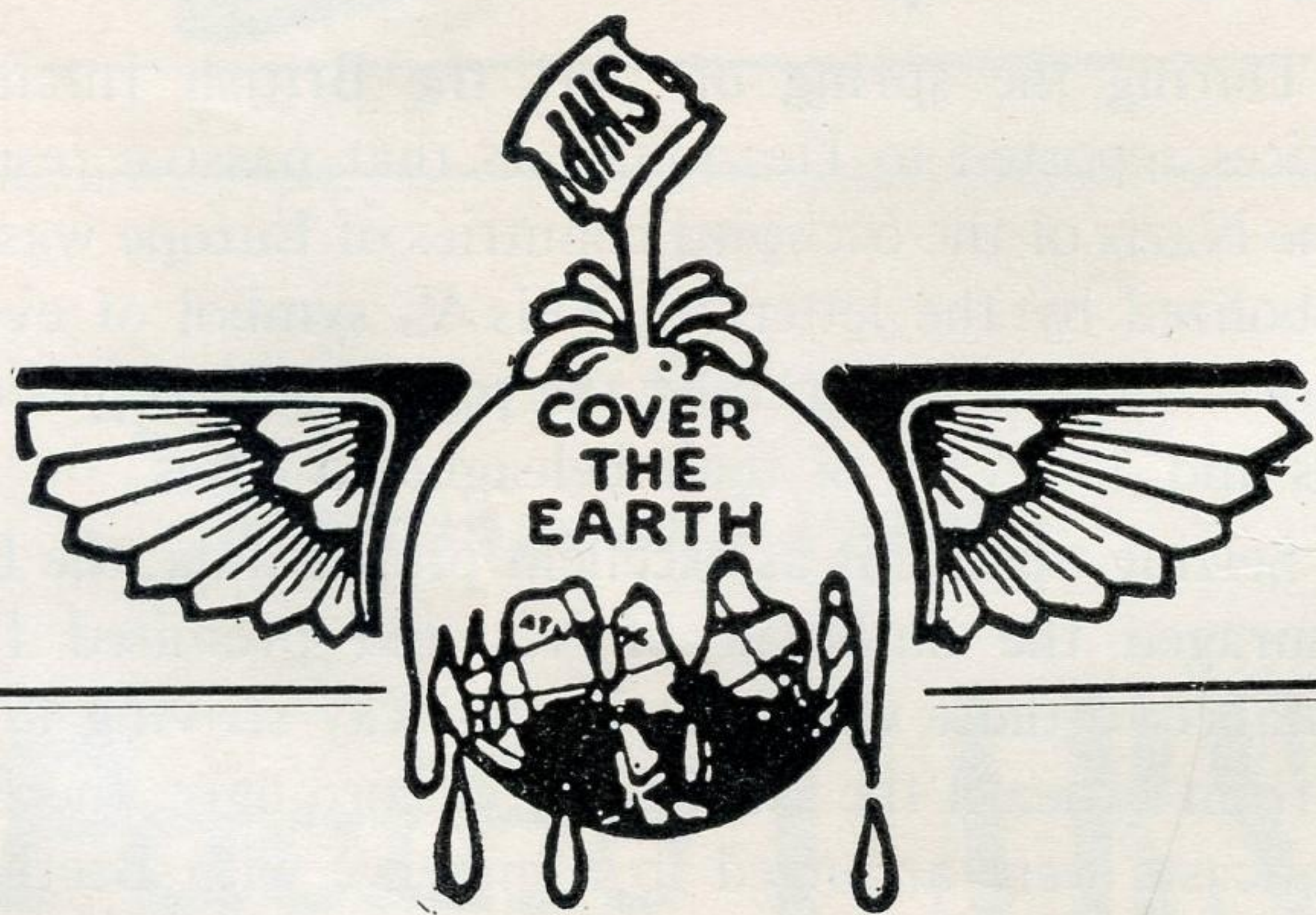
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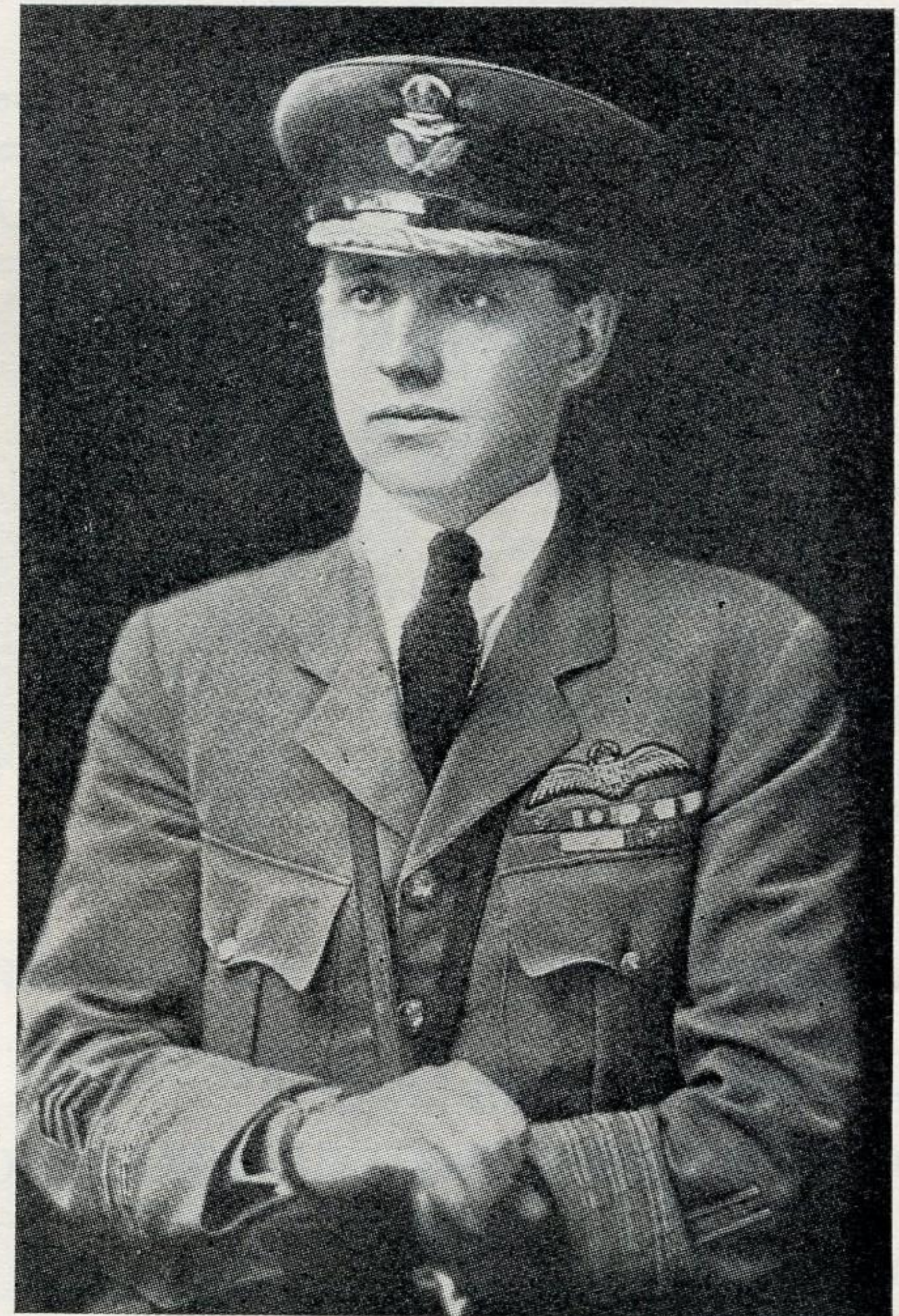
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# Famous Canada

## ● No. 3—Barker

*"They are too near to be great, but our children shall understand when and how our fate was changed and by whose hand."*



With the advent of the second world war the above inscription, which is carved on the walls of the Parliament Buildings at Ottawa, attains new meaning. The "children," the boys of the R.C.A.F. do understand and they are in a position to appreciate the bravery and ability of men like Barker who, with inefficient tools, did their best to finish the job.

Lieutenant-Colonel William George Barker, V.C., D.S.O. and Bar, M.C. and Two Bars, Croix de Guerre, Medal for Military Valour (Italian), was for nineteen years a very ordinary boy who lived in Manitoba and loved shooting and riding. Shortly after the outbreak of war he enlisted and went Overseas with the First Battalion of the Canadian Mounted Rifles. The static condition of the war caused them to be entrenched as Infantry. The apparent freedom and cleanliness of aerial warfare appealed to Barker and when his application was accepted he left the mud and joined the 9th Squadron, a Corps Squadron, operating on the Somme. Because of his excellent marksmanship record he was attached to the Royal Flying Corps as Second Lieutenant in April 1916.

During the months of intense activity on the Somme Barker gained a reputation for accuracy that assured the reliability of wireless messages preceded by his R32. He insisted on flying low and thereby acquired intimate and invaluable knowledge of the entire Somme area. In Aug-

# adian Airmen

ust he was attached to the 15th Squadron as an Observer and, in that capacity, he was detailed to photograph German defence. On one occasion he was attacked by two scouts which he successfully drove off. After taking the photographs he was again attacked by four scouts, which he also drove off. This exploit, coupled with his consistent good work, won for him his first decoration, the Military Cross.

His greatest service as an Observer was perhaps in November, 1916, at Beaumont Hamel. Flying low above the Ancre he noticed German preparations for a counter-attack. His accurate and immediate report enabled the British to break up the force of about four thousand with considerable enemy losses.

At the conclusion of the Somme battles he was sent to Harborough, Norfolk, to train as a pilot. After a very brief training period he returned to France and was promoted to Captain and given command of C flight.

His splendid service during the British advance on the Hindenburg line was rewarded by his second decoration, Bar to the M.C. After a somewhat unspectacular spring and summer Barker received orders to return to England as an Instructor. After a few weeks the quiet life of a training camp became unbearable to Barker and, in an effort to get back to the excitement at the Front, he made life miserable for the officers at camp by zooming over their quarters at weird hours. This unprecedented action served its purpose and Barker was sent back to France, there to join the 28th.

The Flanders offensive was at its height. Information was received at G.H.Q. that a large number of Germans were coming to relieve the exhausted troops. The six machines of Barker's flight winged their way low over the double row of poplars that lined the Ypres-Menin road. Almost a battalion of infantry was standing motionless under the trees—very few escaped the fire from Barker's six machines. Their duty done, they turned for home, but out of the clouds came a formation of ten enemy machines. The German Albatross D5's were faster and more powerful than the Camels used by Barker's flight but they were much slower in turning. Taking advantage of this Barker circled, cleared the enemy fire and brought down two of the Albatrosses.

Because of Italian misfortunes at Caporetto, the 28th Squadron entrained for Milan. Their arrival was enthusiastically hailed as an indication of Allied unity.

Christmas, 1917: Strict orders had been issued against unauthorised flights, but an Austrian balloon, floating lazily in the sky, was too much of a temptation and Barker and a couple of lieutenants took off and carried out an offensive against the balloon. For good measure they also razed the Aerodrome. In the inevitable retaliation by the Austrians the following day Barker once more illus-

trated his flying skill and courage, destroying two more enemy machines. By January he had brought his total up to five machines in the two months he had been in Italy. "For his splendid example of fearlessness and magnificent leadership . . ." he was awarded the Distinguished Service Order in February, 1918.

He continued this aggressive fighting and by March had brought down four more machines and two balloons, for which good work he received his next decoration, Second Bar to the M.C. By this time the initiative in the air had completely switched from Austrian to Allied and undoubtedly a great deal of credit for this change belonged to Barker.

In May, 1918, he was decorated with the Croix de Guerre for his splendid service as escort to the French, and for his services before and during the Piave fighting. Barker received the Medal for Military Valour from the Italian Government.

The "ceiling" of Barker's career was October 27th, 1918. He had been stationed near the Somme and had just received orders to report at Hounslow to take over the Squadron there. His total official victories numbered forty-six. His equipment had been sent ahead by rail. Barker climbed into his Snipe—his experiences are best portrayed by the official statement accompanying the announcement of the award of the Victoria Cross:

"On the morning of the 27th October, 1918, this officer observed an enemy two-seater over the Forest of Mormal. He attacked this machine and after a short burst it broke up in the rear. At the same time a Fokker bi-plane attacked him and he was wounded in the right thigh, but managed, despite this, to shoot the enemy aeroplane down in flames.

"He then found himself in the middle of a large formation of Fokkers, who attacked him from all directions, and was again severely wounded in the left thigh, but succeeded in driving down two of the enemy in a spin.

"He lost consciousness after this, and his machine fell out of control. On recovery he found himself being again attacked heavily by a large formation and singling out one machine he deliberately charged and drove the same down in flames.

"During the fight his left elbow was shattered, and on regaining consciousness he found himself still being attacked but notwithstanding that he was severely wounded in both legs and his left arm shattered he dived on the nearest machine and shot it down in flames.

"Being greatly exhausted he dived out of the fight to regain our lines but was met by another formation which attacked and endeavoured to cut him off; he succeeded in breaking up this formation and reached our lines, where he crashed on landing . . ." A superb finale to the war.

Barker recovered from his wounds and returned to Canada late in 1919. In 1920 he was sent to England as Liaison Officer at the Air Ministry. He returned to Canada and in 1930 became the president of the Fairchild Aviation Corporation. At a demonstration for the Department

(Please turn to Page 20)

# Wrought Aluminum Alloys

Prepared by

SQUADRON LEADER A. A. RABNETT, M.B.E., R.C.A.F.

## ● Anodic Oxidation Process

This process, which is referred to as anodizing, is used exclusively for coating aluminum and aluminum alloy surfaces. An aluminum hydroxide surface is produced on the work which has good corrosion resistance and provides an excellent bend for paint.

This treatment is not a plating process, so the anodic coating has no measurable thickness. The anodized surface is soft and easily scratched, which necessitates giving the treated surface a coating of primer before handling it to any extent.

Anodic treatment is recommended for all aluminum alloy parts except Alclad. If Alclad is to be left unpainted, anodic treatment is not necessary; but if the Alclad is to be painted, the anodic treatment provides a better surface for adhesion of the paint. Castings are seldom anodically treated because they already have an excellent rough surface for the adherence of paint. In addition, castings usually have sufficient thickness of metal to minimize the danger from a little surface corrosion.

Steel and copper parts cannot be treated by this process and must be left off assemblies that are to be anodically treated.

It is general practice to anodically treat all parts prior to assembly. When sub-assemblies do not contain any dissimilar metals, fabric, or sealing compound, and are not subjected to salt water, it is permissible to treat them as a unit. Such parts as wing ribs, built up brackets, and shelves are in this classification. The anodic film will penetrate about one inch inside the edge of a rivetted joint, but will not coat the metal immediately adjacent to the rivet inside the joint. It is important to do all cutting, drilling and forming possible, prior to anodic treatment in order not to break up the film; the rupture of the film after treatment permits local corrosion. All work should be primed after treatment before assembly. When holes must be drilled on assembly after anodizing, the screws or rivets inserted in these holes must be coated with wet primer when inserted, to protect the raw edge exposed by drilling.

The standard electrolyte used in the anodic oxidation process is a solution of chromic acid ( $\text{CrO}_3$ ) in water. The chromic acid content varies from 5% to 10% in different baths. The chromic acid must be at least 99.5% pure and is limited in its sulphate and chloride content.

The tank is made of steel and is equipped with iron pipe coils for heating and cooling purposes, as well as equipment for agitating the electrolyte. A direct current generator permitting voltage control between 20 and 40 volts is used. In order to adequately rinse the plated parts and facilitate drying, a second tank containing water at 150 degrees F. to 185 degrees F. must be available.

Parts to be treated normally require no cleaning, un-

less coated with grease, oil, or paint; then they should be cleaned with carbon tetrachloride, or by some other method. The parts to be treated are suspended in the electrolyte by means of wires or clamps, or perforated containers made of aluminum or aluminum alloy. The parts are suspended from the anode connection; the steel tank is the cathode. Parts can be treated in sections by overlapping adjacent films. During treatment the temperature of the electrolyte must be maintained between 91 degrees F. and 99 degrees F., the voltage being gradually built up to 40 volts and maintained at that figure as long as necessary, the length of time depending on the percentage of chromic acid in the electrolyte. A minimum period of 30 minutes is required for 10% chromic acid solutions. After treatment, to accelerate drying, the parts are washed in clean, fresh, hot water at a temperature between 150 degrees F. and 185 degrees F.

If there is some doubt of an imperfection in the film, an indelible pencil mark should be made on the spot and then rubbed off with a damp cloth. If the film is satisfactory, it will retain the indelible mark. This fact is made use of in stamping anodically treated surfaces; an inspection stamp is made on each part with indelible ink, and will remain on even after the removal of paint that has been subsequently applied.

An anodic film will bring out small cracks in the metal that were invisible before treatment, therefore small fittings, already bent, should be inspected after this treatment.

Rivets may be anodically treated before heat treatment. Parts must not be heat treated in a salt bath after the anodic treatment, otherwise the film will be destroyed; all parts except rivets are anodically treated, after heat treatment and forming are complete. When rivets are heat treated in a tubular container and not in contact with the salt, the anodic film is not injured.

## NOMINAL COMPOSITION OF WROUGHT ALUMINUM ALLOYS

ALLOY	Percent of Alloying Elements. Aluminum and Normal Impurities Constitute the Remainder		
	Copper	Manganese	Magnesium
	2S		1.25
3S		1.25	1.00
4S		1.25	1.00
17S	4.0	0.5	0.5
24S	4.20	0.55	1.50
2S		1.25	
3S		1.25	1.00
4S		1.25	1.00
16S	2½	Nil	0.5
17S	4.0	0.5	0.5
24S	4.20	0.55	1.50

The nominal composition of A 17S is similar.

## TYPICAL MECHANICAL PROPERTIES—WROUGHT ALLOYS

Alloy and Temper	Strength in Tension		Shear strength lbs. per sq. inch
	Yield	Ultimate	
2S—O	5,500	13,000	9,500
2S—½H	15,500	17,000	11,000

(Continued on next page, Col. 1)

# Coal Harbour HIGHLIGHTS

Written by SGT. E. R. COAN

Between Dark and Dawn comes a pause in the day's occupation: this is known as "the children's hour." So wrote Robert Browning. But the night of the 21st of May, 1941, will for many years bring pleasant memories to the Sergeants who were fortunate in being present at the official opening of the Sergeants' Mess.

The night was young when the Sergeants finally made their way to the mess. Members present were: W.O.2 E. Daykin, F. Sgt. F. G. Lawrence, F. Sgt. N. E. Lear, F. Sgt. P. J. Edmond, F. Sgt. S. Clerke, Sgt. L. D. D'Anjou, Sgt. M. W. Follis, Sgt. E. R. Coan, Sgt. R. Rogers, Sgt. S. Charman; Sgt. H. McDade, Veterans Guard of Canada; Sgt. A. Wilson, Veterans Guard of Canada; Sgt. J. Bateman, Veterans Guard of Canada.

The Officer Commanding the station, Flying Officer G. A. Mills, and all Officers of this Detachment and of the Veterans Guard honoured us with their presence, namely: F. Lt. G. L. Smith, F.O. G. M. Chandler, F.O. L. J. Armstrong, F.O. H. S. Morton, F.O. R. M. Cumming, Lieut. W. Waddell (Veterans Guard of Canada).

Beer, pickles and cheese were had by all, for whoever heard of tea being served in the Sergeants' Mess? Such a thought would make Sergeants die of shock. W.O.2 Daykin proposed a toast to the Officer Commanding. A toast to His Majesty the King—God Bless Him—was proposed by Sgt. Coan. The Officer Commanding then declared the Sergeants' Mess officially opened. Lieut. Waddell rendered a song, "The Bonnie Banks of Loch Lomond" with such fervor that he brought tears of sentiment to the eyes of Scottish members. Whether it was the thoughts of "Bonnie Scotland" or professional jealousy, I will leave to your discretion. F. Sgt. Clerke acted the part of a Hula dancer, with such gusto and "oomph" that Flying Officer Chandler, whose leave is much overdue, could not be restrained from taking the floor. I wonder if it was the thoughts of tropical nights and that certain gal that inspired the Flight. The mess members were



Sergeant's Mess, Coal Harbour

grateful to Cpl. Dobree, who brought along his electric phonograph and a variety of records. The main encore was "She really meant to keep it till she married," but just in case the reader of this article gets me wrong—it was her Grandma's wedding dress, but who are we to think otherwise. As the evening was drawing to a close we all had a sing-song. Then followed the speeches. I wonder how many members wished they were a second Lincoln, but judging from the speakers, it was more than the beer that was talking. Sgt. McDade of the Vets Guard paid tribute to the congenial fellowship of the Sergeants of the Air Force, and if I am any judge of character he meant it. Lieut. Waddell made a series of speeches which were undoubtedly of great moment to those who understand the Scottish tongue. I, myself, being fully relaxed that evening, got a bit mixed up in my speech, or was it the thoughts of George Washington, who history tells us never told a lie, but I sure made a bad break in saying the right thing at the wrong time, as gathered from the lips of various members the next day. My speech went something like this: "O.C., Mr. Chairman, Officers, and Sergeants of this mess, the finest buch of fellows I ever met was at Camp Borden—Welcome, fellow officers, I hope you don't come again." Such was the opening of this mess. A good time by all and naturally a few regrets the next day, but that is another story.

## ● Station Chatter

The gathering at "Scotch Corner" at the opening of the Sergeants' Mess, composed of Mr. Suttie, Assistant Engineer, Sgt. McDade and Lieut. Waddell were heard late in the evening conversing in argument in a language believed to be Gaelic.

A curious outbreak of sickness and compassionate leave are apparent at Vancouver and Pat. Bay among station personnel due for posting to Coal Harbour. "Curious?"

Personnel arriving in exchange were greeted by typical Coal Harbour weather, but will later appreciate the amenities of this "Millionaires' Paradise."

What has happened to Flying Officer Chandlers' "dog," or has the approaching leave put the animal in the background?

Honours this month go to W.O.2 Daykin, who took a dive off the crash boat to save a canine friend.

## WROUGHT ALLOYS

(Continued from Page 4)

2S—H	21,500	23,500	13,000
3S—O	6,500	15,000	11,000
3S—½H	19,500	21,000	14,000
3S—H	26,000	29,000	16,000
4S—O	10,000	26,000	16,000
4S—½H	32,000	34,000	19,500
4S—H	38,000	41,000	23,000
17S—O	10,000	26,000	18,000
17S—T	35,000	58,000	35,000
17S—RT	46,000	61,000	36,000
Alclad 17S—T	32,000	55,000	32,000
17S—RT	40,000	57,000	32,000
24S—O	10,000	26,000	18,000
24S—T	43,000	64,000	40,000
24S—RT	53,000	67,000	41,000
Alclad 24S—T	40,000	60,000	39,000
Alclad 24S—RT	49,000	62,000	39,000

# UCLUELET

Written by:

CY. YOUNG, R. 56935—A.C.1.

The mail packet *Uchuk* bobbed about like a cork in the heavy seas as she threaded her way among the treacherous shoals and reefs of Barkley Sound. Nine men in blue Air Force uniform clung to taffrail and rope hanging from the bowsprit. The waves lashed them with the full fury that has made this stretch of coast known to every West Coast seaman as the "Graveyard of the Pacific."

The storm-tossed airmen are prairie men, their systems more used to "prairie schooners" than sailing schooners. Their breakfast is already over the side and their faces match the salt green of the Pacific. They are on outpost duty, bound for Ucluelet and the bombing and reconnaissance squadron that patrols the vast stretches of rock and timber land of the West Coast. They are four hours out of Port Alberni and an article in the Port Alberni newspaper is still fresh in their minds. They are wondering exactly what is meant by ". . . and Ucluelet, an outpost of the Empire—entirely remote from civilization."

Leaving Port Alberni they travel in the quiet waters of the Alberni Canal past several small pilchard and salmon canneries. Here and there a deserted board shack is mute evidence that man has panned for gold in the nearby waters. White rivulets race down the fir-covered mountain sides that line the channel. As we put in at the cannery at Kildonan we meet up with a little of the old world. On the docks, in ragged clothing, Japanese and half-breed Indians wait to carry the supplies from the boat to the cannery. Coolie labor, with an Indian woman and child, stolid-faced, watching the proceedings unmoved and sleepy-eyed.

At the head of the channel at Banfield is the cable station and we see from the boat that there is a determined looking band of soldiers on hand to guard it.

A rough time of it on the open sea now, for the next hour and a half, and we will be at Ucluelet.

We find it is a small fishing village faced by three mountains. There are hundreds of small craft in the inlet belonging mainly to the fishermen, who are without fear and venture forth in their tiny shells of crafts for salmon in the worst kinds of weather. There is a heavy rain, and we are told that we are in one of the worst rain belts in the world with an annual precipitation of about one hundred and fifty inches. Across the channel a pilchard cannery belches forth its smoke and steam. Facing the cannery in a great clearing the proud flag of the Royal Canadian Air Force moves in the wind. The camp has been carved from the rocks and wilderness and great stumps and logs are everywhere. The barracks and officers' quarters have the freshness about them peculiar to new lumber. Stores and mess buildings and hangars have an air of progress about them and you have a feeling that great things are being done here.

Stranraer flying boats and Blackburn Sharks lie on

the still waters of the channel and on the ramp. Riggers and fitters on gang ladders are busy with wrenches and other tools adjusting struts, wires, motors.

"915 will fly today," the word goes round, and the crews responsible for the D.I. or daily inspection of the aircraft hasten their work. The grease and grime of their overalls belies the fact that these men were on parade this morning, that their brass glistened in the sun, that their shoes gleamed with polish, uniforms were well pressed and chins were free of alfalfa.

In the backwoods axes ring out their song of triumph over unwanted timber. Hugh crosscuts belly their way through fir trees of tremendous girth and once proud sentinels of the forest are no more. Chains rattle and girders and cross beams swing into place and the skeleton of a new hangar takes form.

Marine craft swing out from the wharf and aircraft crews working on aircraft afloat in the channel are brought in for more equipment or taken out for D.I.'s on their aircraft.

A dog stands on the prow of a crash boat as it skims along the water—he is the mascot of our marine section.

The bugle sounds 'come to the cookhouse door, boys,' and there is a scramble for the mess. A line forms and men jostle one another like schoolboys. The cooks are relieved of steaming appetizing meals that would do credit to Child's and the mess is filled with the sounds of good humor and fun.

The orderly officer approaches and bawls out "Any complaints?"

If the knives or the spoons bear evidence of the previous day's meal-time siestas he wants to know about it and there is no extra "kitchen police" duty for the man who complains.

It is a seven-day-a-week job for the men who man Canada's defences. Once a month the men are allowed forty-eight-hour passes to go "outside" to Vancouver or Port Alberni.

The navy boat usually arrives in Port Alberni in time for the boys to take in the Friday night dance put on for the loggers and scalers who are also out of the bush on "48's." The friendly people of this rain-soaked town do everything possible to show the airmen a good time and the fellows really enjoy themselves.

Boxing, ping pong, badminton and moving pictures keep the minds of the airmen occupied in the evenings in camp. A well-stocked canteen supplies the wants of the airmen, whether it be beer or laundry soap. The men must do their own washing, and there is probably more tattle-tale gray per capita in Ucluelet than in any other part of the world.

There is a well-stocked library and all bookworms may worm to their heart's content.

There is no admission fee to the airmen's movies, which must sound very attractive to a civilian. At the end of the feature, though, we are not surprised to feel a tap on the shoulder and find a corporal with a certain look

(Please turn to Page 22)

# "We Are the Air Force"

Have you heard it? Can you sing it?? Have you obtained a copy? Of course you will when you see and hear it.

Patricia Bay again comes to the fore and this time has produced a song for the Air Force that will go over big and catch the fancy of the music-loving people not only because of its catchy air but the sentiment expressed in the words as well.

The words of this song were composed by W.O.1 James Ware, in charge of the Photographic Section at Patricia Bay Station, R.C.A.F. The music was written by L.A.C. J. Maxwell Muir, also of the R.C.A.F.

The song has been dedicated to the British Commonwealth Air Training Plan and the royalties from the sale of the many copies that will be printed will be turned over to the Canadian Red Cross Society for their use.

The song has also been set to band music, making a new and delightful march to which we hope many a weary foot will pick up its lively step when it hears the tuneful melody and many a tired voice will sing the song and enliven a drooping spirit.

Here it is:

## "WE ARE THE AIRFORCE"

"Let's join hands and pledge ourselves  
To rule the waves on high,  
And never shall we show our tail,  
We'll fight until we die.  
Although we come from far-off lands,  
We join ourselves as one,  
To destroy the tyranny of Hitler  
And the Hun."

Chorus:

"For we are the Airforce, the Airforce are we,  
Crusaders of the air in the fight for liberty.  
And when we see his squadrons strong  
And we are all alone,  
We'll dive and zoom, we'll loop and roll,  
We'll make them turn for home.  
His railways, ships and factories  
We'll bomb by the score,  
We'll raze everything he's got  
And he shall rise no more.  
So here's a pledge, a pledge for all,  
To fight to keep us free,  
For we are the Airforce,  
The Airforce are we."



SQDR. LDR. A. A. RABNET

## R.A.F. SUPERIORITY

The authoritative Aircraft Year Book for 1941, published by the Aeronautical Chamber of Commerce of America, made the prediction that American-made war planes within the next few months will give the R.A.F. numerical supremacy over the Nazi *Luftwaffe* for the balance of the war. This publication further stated that "From all accounts, and they are from fairly reliable sources, the British combat plane production, combined with the American output, is superior to Germany's in those highly important categories such as fast pursuit, long range and medium bombers and patrol flying boats." It further estimated that 3500 American-built planes have been exported to Britain since the war began in 1939 and that the industry since July, 1940, has built a total of seven thousand war planes and that eighteen thousand will be produced this year and thirty thousand in 1942.

From Washington, D.C., comes the statement that production of two-engine bombers was doubled in the first six months of this year. It was learned that two-engine bomber production gained 92%, the output of one-engine dive and torpedo bombers 146% and that of pursuit, observation and other military aircraft 142%.

Added to this new orders are being considered and the industry is ready to tackle any assignment, but every possible source of sub-contracting will have to be used before more plant expansion programmes are started. In spite of this a recent survey has shown that there are 28,000 industrial establishments with no American defence orders.

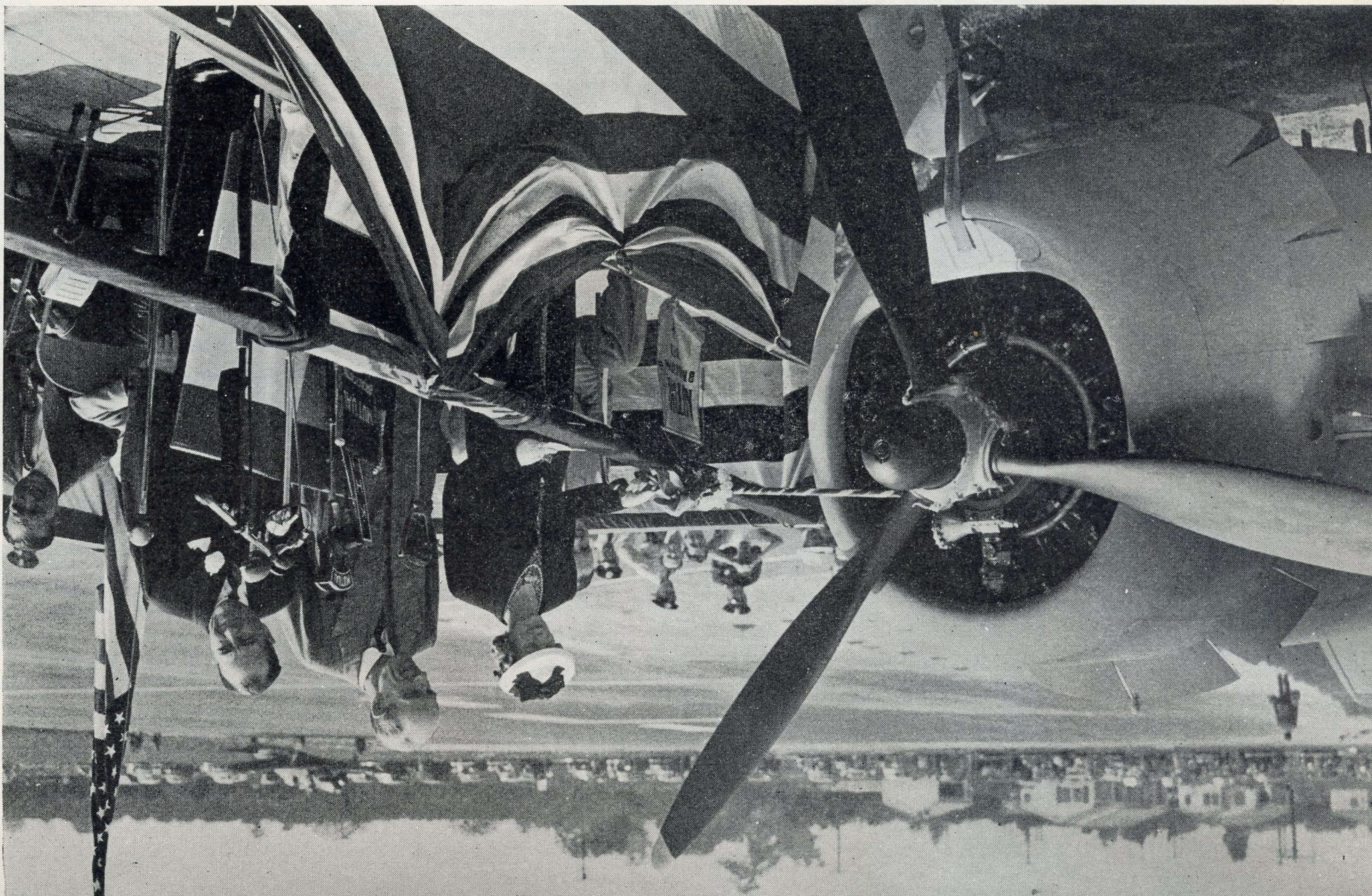
The new Boeing "Flying Fortresses" in company with Hampden and Wellington bombers are now being used against Germany with devastating results. American-built aeroplanes have taken part in all phases of the war and have been used meritoriously on every front—over England, in Africa, over the Mediterranean, in Greece, over the English Channel and the Atlantic Ocean.

**Nootka-Banfield Co. Ltd.**

525 Seymour Street

Vancouver, B. C.

# I CHRISTEN THEE "VENGEANCE"



With the words, "I christen thee 'Vengeance,' new-est 'V' in Britain's campaign for Victory," Lady Halifax, on July 23, broke an oxygen-filled wand over the propeller hub of the new Vultee dive bomber being produced for Britain at Vultee Field, California.

Left to right, Lady Halifax, Lord Halifax, British ambassador to the United States, and Richard W. Millar, Vultee's President.

The Vengeance is a single motor ultra-modern dive bomber, which British officials claim will outperform even the most modern plane of its type yet designed.

"Vengeance is the name of the plane," Lady Halifax said, "a word that strikes a chill into all of us. But I prefer to think of its mission not as ruthless, savage vengeance upon a nation, but as the vengeance due a minority who would suppress and stifle common decency. "I prefer to look on this Vengeance plane not so much as a weapon of destruction as one of construction, which by its very power cannot help but speed this war to a successful conclusion, and once again restore peace among men and among nations."

Named the "Vengeance" by the British Air Ministry, a new Vultee dive bomber is now in production. First airplane of any type to embody all of the tactical experience gained in actual combat in the present war, the bomber is described by a British spokesman as "a weapon of retaliation with performance better even than the most modern of its type."

Vengeances are already flying, according to Richard W. Millar, president of Vultee Aircraft, Inc. He pointed

out that traditional procedure in the development of a new high performance plane was thrown overboard. The long delay occasioned by the development of a prototype and co-ordinated effort on the part of Vultee's engineering staff. Tooling for production in large quantities was well advanced before the first plane took to the air a few weeks ago.

In addition to immediate production of a large number of Vengeances by Vultee, the plane is also being manufactured under license in quantity by Northrop Aircraft, Inc.

Performance and design data have not been released, but company officials make the unqualified statement that the Vengeance outperforms any known plane of similar type in the world today. In addition, the most modern protection devices and armament have been installed.

Bombs are carried internally and landing gear is retractable to reduce the drag and permit greater speed. The Vengeance is powered with a Wright cyclone engine. British requirements for the Vengeance included exceptional range. Germany's famed Stuka is rated at a 500 miles range fully loaded, which allows the Nazis to operate successfully from French bases against England. The British, however, have a definite distance problem to face since their bombers must travel hundreds of miles further to reach important German centers.

The Vengeance was designed with this problem in mind, and far from sacrificing bomb load to gain added range, the plane is reported to carry even heavier loads at

(Please turn to page 21)

# Economic Aspects of Light Engines

By CARL T. DOMAN

*Aircooled Motors Corporation*

From the title of this paper one would believe that we would deal with the possible sales outlets and sales potential of the light airplane engines. Consequently, it might be better to give this paper the title of "Co-ordination of Light Aircraft and Commercial Engine Design . . . and its Effect on Manufacturing Cost."

When speaking of light plane engines we, in our organization, normally refer to those engines with an output of less than 100 horsepower, feeling that when the power goes above this figure it is getting into another class. However, we feel that 100 h.p. engines can furnish the power to give satisfactory performance in an airplane carrying not more than four passengers.

It is well understood that the engine cost represents a large proportion of the cost of building an airplane. Consequently, the airplane maker places more and more of the responsibility of lowering the selling price of the airplane, on the engine maker. In answer to that challenge we feel that the three light plane engine makers, or those companies who have built the greatest number of engines in the past year, have more than done their part in reducing the cost of the light airplane. We refer to the Continental Motors Co., the Lycoming Engine Division of Aviation Manufacturing Corporation and Aircooled Motors Corporation.

Late in 1937 it was decided by our organization to manufacture engines for both the light airplane field and for the smaller type of commercial motor vehicles. Therefore, after a great deal of study of the different types of design, it was concluded that a four cylinder, horizontally opposed engine offered the greatest number of advantages from a cost and performance standpoint. For the application of the horizontally opposed engine for the light airplane it was decided that a horsepower output of 50 at 2575 r.p.m. was desirable and for commercial work a horsepower of 45 at 2500 r.p.m. The designs of engines for the commercial as well as the aviation adaptations were carried on simultaneously. Shortly it became evident that both engines could be built with the same piston displacement. It was then decided to use  $3\frac{5}{8}$ -inch bore and  $3\frac{5}{8}$ -inch stroke for both engines.

As these parallel designs progressed, it became apparent that the engines could be kept remarkably similar in design, keeping in mind that the aviation engine should be as light as possible, consistent with a reasonably low cost, and the commercial engine as low in cost as possible without affecting the power output or the general operation.

The similarity of parts made it possible for our Tool and Operation Department to design the production fixtures so that the majority of the parts could go through the same fixtures—for example, the aluminum crankcase on the aircraft and the cast iron crankcase for the commercial engine will be found one behind the other on our machining line.

For use in the light planes it was first thought advisable to use a down-draft carburetor, thus allowing for the use of identical cylinders, on both the aircraft and commercial engines. However, a survey of the carburetor field indicated that a satisfactory carburetor was not being manufactured as a regular production item. Furthermore, the use of a down-draft carburetor necessitated a fuel pump, plus a hand-operated auxiliary pump for aircraft application. The plane-makers were opposed to this, due to the added complication and cost. It was, therefore, decided to use a conventional up-draft aircraft carburetor with the intake manifold distributing zone case in the crankcase and within the level of the oil sump. On the commercial engine, however, it was found necessary to use the down-draft carburetor, due to the fact that it was not practical to mount a carburetor underneath the engine. This necessitated running two different kinds of cylinders through our plant.

For the aircraft engine it was decided to use a unit cylinder—that is, the cylinder barrel and cylinder head cast together, into which would be shrunk a cast iron liner. For the commercial engine, because of the need for keeping costs to a minimum, it was decided to use an aluminum cylinder head, with the minimum amount of aluminum, and screw and shrink into it a cast iron cylinder barrel, which method of assembly has decided advantages.

The all-aluminum cylinder used on the aircraft engine in a casting weighs approximately 12 lbs. and machined weighs 10.5 lbs. This cylinder normally would be quite a tricky foundry proposition. However, the use of proper risers within the valve case has eliminated any foundry difficulties. These risers are cut out in the machining operations. In the machining of the cylinder, extra care must be taken to see that it does not become at all heated—otherwise it is impossible to hold the bore straight and round. However, by the use of a proper coolant this problem has been eliminated.

The combustion chamber is completely machined, also the recess around the valve seat. We find that it is possible to hold the compression ratio very close by machining. When an attempt was made to cast the chamber to size to eliminate the machine work, we ran into a variation of .5 in the compression ratio. Furthermore, completely machining the combustion chamber results in practically no increase in cost.

To our surprise we found that an ordinary iron liner with a small percentage of chrome and nickel, worked out much better than the more expensive liner having an austenetic structure, or one which we thought would result in the liner expanding the same as the cylinder itself. We had reasoned that the aluminum cylinder would necessitate the use of a liner with approximately the same coefficient of expansion. However, our tests have shown that when the iron liner, which is only  $\frac{3}{64}$  inches thick, is shrunk in place with approximately .012 shrink, it expands practically the same as the aluminum which surrounds it. It is possible, if desired, to fit pistons to this

engine with .001 clearance, or even a size-to-size fit, without scoring.

In assembling the liner to the valve seats and valve guides in the machined cylinder casting, the cylinder is heated to approximately 600 degrees and then the liner and valve guides and seats simply dropped in place. It has been found that it requires less than a minute to install the two guides, the two seats and the liner. In other words, the cylinder temperature is high enough so that the normal drop will not interfere with the assembly or shrink fitting of the above mentioned parts.

The cylinder construction used in the commercial engine is quite unusual in that it incorporates a cast iron barrel screwed and shrunk into an aluminum alloy head. The cylinder is machined completely before the assembly operation. The threads in both head and barrel are indexed so that the two parts when screwed together will form a seal joint with the flange in definite relation to the cylinder ports. A9 copper asbestos gasket between the head and the barrel, compressed to a predetermined thickness, brings about a triple seal against loss of compression pressures,—that is, the use of the shrink on the land above the threads, the shrink on the land below the threads and the gasket itself. It is possible to remove the cylinder from the head by heating the unit at 600 degrees.

Even though the cylinders are quite different in design, many of the parts which make up the assembly of both are the same. I refer to the valves, valve seats, valve guides, valve rocker arms and valve push rods. The valve springs are entirely different in design, inasmuch as cadmium-plated dual valve springs are used on the aircraft and single springs with shimmy dampeners are used on the commercial engine.

The connecting rods are identical for both engines. Both engines use 1035 carbon steel connecting rods. It was originally intended to use SAE 3140 in the aircraft engine. However, in order to simplify the processing it was decided to use connecting rods with a slightly heavier section in both, and carbon steel, thus resulting in manufacturing economies.

The crankshaft could not be identical for both engines, although an attempt was made to use the same design for both, with the idea of bolting on a stub shaft for mounting the propeller. This was decided to be impractical. Yet, basically both shafts are close enough in design to go through the same machining design to go through the same machining fixtures. The chief difference in the machining of the shafts is the longer bearing at the propeller end in the aircraft engine. The aircraft shaft uses 3140 steel, while the commercial engine uses carbon steel with tocco-hardened crank pins and main bearing journals.

Identical bearings are used in both engines except for the thrust bearing of the aircraft engine which must be larger to take the load of the propeller. However, as mentioned above, the other bearings are the same—that is, the connecting rod bearings (big end and small end), the centre and timing gear case and bearings are the same,

the rocker bushings are the same and the camshaft bearings are practically the same except for a slight change in the oil grooves and the length of the bearing. However, the same tools are used for boring the cam bearings in both engines.

The oil pump designs are identical as to dimensions but in the aircraft engine the oil pump housing is of aluminum and the gears are duralumin, whereas the commercial engine uses a cast iron oil pump body and cast iron gears. The pumps, however, are run through production in the same fixtures.

Both engines use carbon steel camshafts which are identical except that the cams are reversed in position, due to the fact that the aircraft engine has the intake valves on the bottom and exhaust on top, whereas in the commercial engine, the valves are reversed. However, the lift curve of each valve, and the timing, are the same for both engines.

The same type and make of spark plug is generally used in both engines—that is, a porcelain spark plug manufactured by one of the larger spark plug companies. However, when the commercial engine is used for light delivery service where there are frequent starts and stops, it is advantageous to use a warmer spark plug, in order to eliminate fouling. For high speed, day-in and day-out performance, the same spark plug works perfectly in both the aircraft and commercial engines. Incidentally, I might mention the fact that we have found these same plugs entirely satisfactory, even though we have increased the B.M.E.P. to 145 lbs. It has been our experience that it is possible to run these automotive plugs for 100 hours at full throttle without any adjustment. We think this speaks well for the spark plug as well as the cooling of the cylinder.

One innovation which has been developed by my company and found to be most satisfactory is the use of composition camshaft timing gears instead of the usual steel gear. The identical gear is used in the aircraft engine as is used in the commercial design. The selection of these gears was based on the fact that we needed a gear that would be light, quiet and at the same time low in cost. We are repeatedly receiving field reports where these gears have run some 1500 to 2000 hours in the aircraft field without any trouble whatever and have also been used in the commercial engine for as many as 50,000 miles with the report that there have been no failures or need for replacement because of wear. In fact they appear to improve with use.

Both engines use Wilcox-Rich hydraulic valve lifters. The valve lifters are identical in design and were used for two important reasons—first, it is possible to design a camshaft, knowing definitely that the timing or vents in the valve would occur as designed and thus increase all-around efficiency—secondly, it would eliminate objectionable valve noise without the necessity of using tricky methods for mounting the valve mechanism in order to obtain reasonable compensation of valve clearances for a wide range of cylinder temperatures. Our experience with

these hydraulic lifters has been satisfactory in both the aircraft and commercial engines. Once the operator learns to leave them alone and does not attempt to make any adjustments the lifters will function without difficulty with quite a broad range of initial valve clearances before oil enters the lifters.

Mention was previously made that the same valves and valve seats are used in both engines. For the intake valve an ordinary 3140 steel is used, whereas the exhaust is a two-piece welded stem valve and the head is 21 per cent nickel and 12 per cent chrome. All valve seats are ni-resist, which incorporates 14 per cent nickel and 2 per cent chrome. Our company has used these seats in the heavy duty air cooled engines since 1933 with excellent results. They were specified originally in the large commercial engines because of the fact that the coefficient of expansion is approximately that of aluminum and at the same time have remarkable properties for standing up under high exhaust gas temperatures and highly leaded fuels. The valve rockers are identical for both engines and are of 1035 carbon steel. The longer rocker arm in both engines is drilled to bring lubrication to the stem, and bushings. It has been found that with the hydraulic lifters it is essential that oil be brought under pressure to the valve rocker bushing, otherwise freezing will result. This is probably due to the fact that with zero clearance at all times at the valve stem, there would be no chance for the oil to go between the rocker pin and rocker bushing.

As far as piston design is concerned, here the engines are radically different. In the aircraft engines we use small trunk type pistons with two compression rings and one oil ring above the pin, while in the commercial engine we use cast iron pistons with two compression rings and one oil ring above the pin and one oil ring below the pin. In the aircraft engine we can allow a little slap, fitting

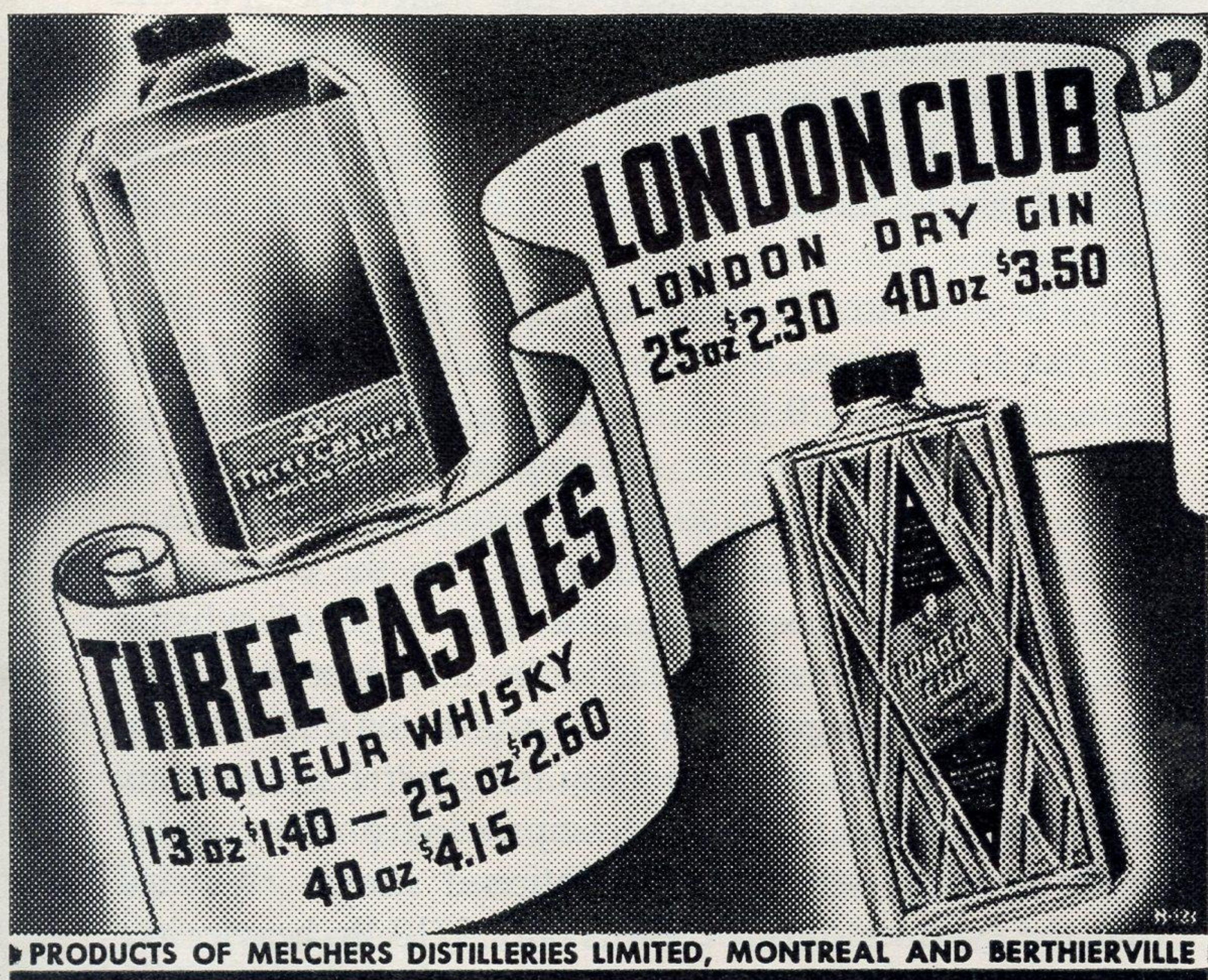
the pistons with .008 clearance. The commercial engine can have absolutely no slap. The aircraft engine uses 6:6 compression ratio, the commercial engine uses 5.5:1 compression ratio with both engines designed to operate with the same fuel—that is, 70 octane.

In the assembly of the two engines, two different lines are used, although they are parallel in the assembly division. We have found that with the different types of accessories that go on these engines, it would be impossible to put them through the same line. Because the engines are so similar in general construction it is possible, however, to use the same workmen on either line without lowering the efficiency of the assembly operation. It might be argued that more careful workmanship is needed on aircraft than on commercial work. This we do not find true, as we are running just as close tolerances on the commercial engine as we are on the aircraft type.

For testing, an entirely different method of procedure is used. The aircraft engine is tested on a stand, permitting the use of a test club, while our commercial engines are run in and tested on electric dynamometers. We feel, however, that sometime in the future, as production increases, it will be impossible to continue to test the aircraft engines on the test stands. The increased volume will warrant investing in dynamometers and blower systems so that the aircraft engine would be tested as are the commercial engines. We are confident that through this method we will not only save time in testing, but also that dynamometer testing will result in an improved product, because it is possible to make slight variations in load through the dynamometer controls—a condition which is impossible when using a fixed test club.

One point which we have perhaps failed to stress in this paper, is the fact that by designing two engines, even though they are used in entirely different fields, it is possible to show a marked decrease in material costs, as well as machining costs. It is possible, for instance, for the Purchasing Department to buy in much larger quantities and thus pass on the savings to the lower volume model. At the same time it also reduces problems of manufacture, because of the fewer number of parts it is necessary to handle. It also permits the workmen to be trained in a general design and results in a decided saving in inspection equipment, as both engines are designed with the same size parts and tolerances wherever possible, even though the materials might be different for each engine.

No doubt many of you who have followed this discussion have the feeling that the power output obtained from these little engines is so small that they would not be of much interest to you who are dealing with the much larger power plants. However, the power which we are obtaining from these engines at the present time is reasonably good. For instance—the present production Franklin 4AC-150 engine develops 50 h.p. plus at 2300, and the commercial engine develops 45 h.p. at 2500 r.p.m. However, it is possible, by a slight change in the camshaft design and compression ratio to obtain from the aircraft engine 60 h.p. at 2350 r.p.m. at a B.M.E.P. of 135 and



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use a fuel of not more than 73 octane. The same output can be obtained from the commercial engine, provided a larger carburetor, manifold, etc., are used. The difference in operating requirements dictate the carburetion and induction system differences.

After having the above two engines in production for approximately 18 months it was apparent that there was a decided need for a light airplane engine having more power. The light airplane industry is following the course of the automobile—that is, there seems to be no end to the demands for greater performance. A survey of the field indicated the need for an 80 h.p. engine. Consequently, six different and distinct engines were designed and studied with the idea of deciding which one would work into our scheme of manufacture most advantageously. I refer to the following table showing the general specifications of these various engines:

80 HORSEPOWER ENGINE STUDY

Eng. Type	No. Cyl.	Bore	Stroke	Displ.	Rated R.P.M.	Weight Complete		Width
						Rated	Dual	
A Opposed	4	4¼	4¼	241	1940	195		33½
B Inverted 'V'	8	3¾	3¾	241	1950	210		20
C Inverted	6	3½	3½	180	2650	210		19½
D Opposed Geared	4	3¾	3¼	153	3100 eng. 1950 prop.	195		25¾
E Opposed	6	3½	3½	180	2650	195		29½
F Opposed	4	4	3½	176	2650	170		30¼

You will note that we gave consideration to engines of from 4 to 8 cylinders. It was finally decided to build the engine designated as "F"—that is the 176 cu. in., 4 cylinder opposed engine. This decision was based on the following observations:

Engine "A" was eliminated because the displacement of each cylinder was greater than we had believed would be satisfactory from freedom of vibration. The engine was too wide and the weight too high.

Engine "B" was eliminated due to the fact that even

though the engine would be a very fine performer, we felt the added complications of the inverted engine and separate oil tanks, oil pumps, etc., would not fit into the scheme of low cost light airplane engines. Furthermore, the weight was even greater than the 4 cylinder opposed 241 cu. in. engine.

Engine "C" was eliminated because it was too heavy, and too costly to build, and also because of the added complications of the oiling system.

Engine "D" was eliminated because the weight was too high. The problem of a satisfactory gear train was one which would require a great deal of experimental work. This was based on our previous experience with geared engines.

Engine "E" — the horizontally opposed 6 cylinder engine was eliminated chiefly because we reasoned that the weight was too great and secondly, we could not find where any one company had ever built one of these engines commercially. While the balance characteristics of the engine appeared to be very satisfactory, we were afraid that it would require a great deal of costly experimental work.

Engine "F" was finally selected, as mentioned above, chiefly because we had had experience in building 4 cylinder opposed engines with a piston displacement very near to that selected, and, consequently, knew most of the manufacturing problems. In addition the engine seemed to be the lightest in weight for the power output, even though it necessitated operating the propeller at a somewhat higher speed than most of the other engines which entered into this study, although not as high as competitive models.

The type of engine selected carries on the same basic fundamentals used in automotive designs, as those engines discussed above. This engine, while at the present time is for aircraft use alone, has been paralleled in study with that of a commercial engine of the same size. At a later date we will offer in production this same type of engine for commercial use. The change would consist chiefly in cutting the crankcase off just rear of the propeller and mounting a flywheel housing and flywheel. On the other end we would mount a blower and housing for cooling the engine.

The new aircraft engine which we designated as 4AC-176 has 4-inch bore, 3½-inch stroke with 7:1 compression ratio and weighs 170 lbs. with dual ignition. A very conservative power output of this engine is 80 h.p. at 2650 r.p.m. and 65 h.p. at 2170 r.p.m. using 73 octane fuel.

Because of the experience gained in the commercial field this engine incorporates the same type of cylinder construction as I described earlier in this paper for use on the commercial engine. In other words, on this new engine we use a high strength alloy iron barrel screwed into an aluminum head with the compression pressure sealed in three places—that is, as mentioned above. We find that the cylinder construction is only 9/10 lb. heavier per cylinder than the all-aluminum cylinder with the iron liner or an assembly having a steel forged cylinder

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screwed into an aluminum head. The decision to use the cast iron alloy cylinder after building and testing several different types was based chiefly on the fact that we wanted to keep the amount of aluminum to a minimum and at the same time use a cylinder barrel which would operate satisfactorily with any automotive type of production piston ring.

The crankcase design is quite different from the smaller aviation and commercial engines described above. This change in design was made chiefly because it resulted in an engine with much broader potential application in that when making the oil sump separate, the engine could be used for future location in the wing or be operated as a dry sump engine, and have a broad range of oil sump capacities.

After a survey was made of the starters and generator equipment available and the costs analyzed it was apparent that if the engine was to be offered to the airplane manufacturers with starter and generator equipment at an attractive price, it would be necessary to utilize production automotive equipment. Consequently, it was reasoned that if a light ring gear could be mounted on the crankshaft, then an automotive starter could be used and an automotive generator gear driven off the crankshaft. This equipment uses 6 volts on a battery weighing approximately 12 lbs. The added weight of the equipment on the engine is approximately 28 lbs. over that of dual ignition with an extra 4 lbs. in the battery over that normally used for lighting. Of course the battery capacity is quite limited. However, an operator soon learns that if an engine will not start after a total of 30 seconds, then there is something wrong. Usually, however, one of these engines, with impulse couplings in the magnetos will fire on all cylinders with not over 10 seconds of cranking. The cranking speed is somewhere around 150 r.p.m. plus 10 degrees Fahrenheit, where it will draw approximately 160 amperes.

This 80 h.p. engine continues the use of hydraulic valve lifters. However, the lifters themselves are of the barrel type, which permits their complete removal without dismantling the engine, which offers certain service advantages. Our experience indicates that the hydraulic valve lifters operate with a minimum of trouble, provided the manufacturer takes the necessary precautions in cleaning all the parts of his engine prior to assembly. Furthermore, all engines manufactured by our company, both for aircraft and commercial use, have lubricating oil filtered and pumped to each engine by an auxiliary system during the running in period. In other words, every drop of oil, after circulating once through the engine, passes through two outside filters, where all the foreign material is removed. This filtering system is largely responsible for the outstandingly fine condition of the interior of one of these engines. At times we wonder if the engine has ever been operated, as the bearings, cylinder walls, pistons, crankcase, etc., appear just as they did when they were installed.

In conclusion I might say that in our opinion the light plane engine maker has done a remarkable job in offering



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*Distillers of Fine Canadian Whiskies since 1857*

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to the airplane makers a reliable, efficient engine at such low cost. However, if one analyzes the background of the three light plane engine manufacturers who have built the greatest number of engines during the last year, it is immediately noted that each one has also had many years of experience in building automotive engines. Consequently, the approach to the design of a light plane engine has followed in many instances the same course as was followed in their automotive units—that is, the design, the manufacture and the testing; all resulting in a better engine for less money.

(Doman)

A: 4AC-150 with 7.0-1 compression ratio, special camshaft, large carburetor.

B: 4AC-150 with 6.6 compression ratio.

C: 4CHO-150 Commercial Engine with 5.5 compression ratio.

Fuel used—73 octane.

(Doman)

#### FRANKLIN AIRCRAFT ENGINE

Model 4AC-176

Bore: 4 inch      Stroke: 3½ inch

Compression Ratio 7.0-1

Dual Magnetos set 30° advance

Fuel used—73 octane

## From England . . .

### ● Group Captain H.R.H. The Duke of Kent, R.A.F., Will Inspect Air Training in Canada

The Dominion's office in London on July 23rd gave this official announcement:

"With the King's approval, H.R.H. the Duke of Kent will shortly be proceeding to Canada for a brief visit.

"His Royal Highness is greatly interested in the Canadian Air Training plan and is desirous of seeing for himself some of the training establishments where pilots and air crews are being trained.

"The proposal has been warmly welcomed by the Canadian Government and the Royal Canadian Air Force."

It is stated by reliable sources that the Duke of Kent, as Group Captain in the R.A.F., has met many of the R.C.A.F. boys serving in England and has become keenly interested in their home training bases. For reasons of security the details of the visit cannot be published, but it is rumoured that the tour will be of about a month's duration in which time he will probably visit a number of Air Schools in each province. The Duke expressed the purpose of the tour—"to acquaint himself at first hand with all phases of the training plan in Canada."

The proposed visit is definitely not a state tour but is an indication of the importance which the British Government places upon the Canadian Air Training plan.

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VACOUVER

# SERVICE POLICE

Royal Canadian Air Force  
- PATRICIA BAY -



THE HAPPY TEN



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## And Still Another U. S. Plant

To meet the requirements of the national defense program, The Sperry Gyroscope Company has completed plans calling for the erection of a new and modern plant in the town of North Hempstead on Long Island. It is anticipated that ground will be broken within a week. Manufacturing operations are scheduled to begin early in 1942.

The new plant, to be known as The Lakeville Plant of the Sperry Gyroscope Company, will be located in Nassau County, south of the Northern State Parkway adjacent to the Queens County line. The property is bounded on the west by Lakeville Road, on the north by Marcus Avenue, on the east by farmlands and on the south by a proposed extension of the Union Turnpike. One hundred and twenty-one acres are included in the property.

"The site of the new plant is in the township of North Hempstead and the Village of Lake Success. The Boards and Civic Organizations patriotically recognizing the national defense aspects of this expansion have promptly granted the necessary zoning permits and have given us the necessary support to allow us to proceed with our plans for construction."

Designed to be one of the most modern structures of its kind in the country, the Sperry plant will include 1,350,000 square feet of floor space. The factory building will be one story, 640 feet wide by 1440 feet long, and 16 feet in height. In addition there will be a three story administration building. As the buildings will cover only 26 acres while a total of 121 acres are included in the property, there will be adequate space for the development of an attractive plan of landscaping, for parking areas and for recreation areas.

The new Sperry plant will be easily accessible to the air transportation facilities at LaGuardia Field. The



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815 Hastings Street Vancouver

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company's Garden Research Laboratory is eight miles away.

It is anticipated that approximately 7,000 new employees will work in the Lakeville Plant. The new manufacturing facilities will not replace any of the company's existing facilities but will be in addition to all plants now in operation.

Among the company's present products are: The Directional Gyro, Gyro-Horizon and Automatic Pilot for airplanes; Searchlights, Sound Locators and Directors for Anti-aircraft protection; The Gyro-Compass, Gyro-Pilot and other marine instruments.

The new Lakeville Plant of The Sperry Gyroscope Company will be built under an arrangement with the Defense Plant Corporation of the Reconstruction Finance Corporation. The plant will be the property of the D.P.C. and will be leased by Sperry.

### IN APPRECIATION

*of the Good Work of the  
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## Promotions ---

### ● Distinguished Flying Cross

For individual exploits in the war against Germany. Flight Lieut. Gordon Raphael: "A relentless, skillful night fighter pilot." He was born in Brantford, Ont.

Flight Lieut. R. D. Grassick: He is the last original of the famous All-Canadian Squadron of the R.A.F.

Squadron Leader D. L. Widdowson: "... flew a blazing, damaged Wellington safely back to England after a raid on Muenster."

Group Capt. E. L. MacLeod has succeeded Group Capt. A. P. Campbell as Senior Air Staff Officer at the Royal Canadian Air Force Overseas Headquarters in England. Group Capt. MacLeod has served with the R.C.A.F. since its formation in 1920, and was the first R.C.A.F. officer to serve with the R.A.F. under the exchange agreement in 1927. He has recently been Deputy Air Member for Personnel at R.C.A.F. headquarters, Ottawa.

### ● Commissions

Alan Lowe: Pilot Officer, graduate of Dauphin, Man., Service Flying School. Stationed at Trenton, Ont.

Eric Mallett: Pilot Officer, graduate of Dauphin, Man., Service Flying Training School.

Sgt. Obs. W. J. Atkinson: Pilot Officer.

### ● Wings

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# HIGH and LOW

## ● And Granny Came, Too!

Among recent callers at the R.A.F. Information Bureau in London's blitzed West End was a potential recruit for the W.A.A.F. who gave her age as 38 but who was obviously a trifle older than that. This gallant "old girl" wanted to be a fabric worker, stoutly maintaining that she could handle a sewing-machine with the best, but when she was finally obliged to admit that she had reversed the figures of her age and that she was really 83, her enrolment was reluctantly refused. "Granny" was patently disappointed, but said they couldn't stop her knitting for the R.A.F. Comforts Fund, anyway!

● Myron Molchan, eight years old, of Ranfurly, might not be very big, as he admits, but "I am stronge" and he's ready to join the R.C.A.F. any day now if room can be found for him. But the R.C.A.F. thinks he's too young.

Myron wrote to the Air Force recruiting officer here. His letter was received Monday. It was printed in a large, free hand with a pencil.

Here it is, with Myron's spelling:

"DEAR AIRFORCE COMMANDER:

"I AM EIGHT YEARS OLD. I PASTED TO GRADE THREE. I WEIGH 63 POUNDS. I AM NOT VERY BIG BUT I AM STRONGE. AND I CAN RUN FAST. I CAN'T WRITE BUT CAN PRINT. PLEASE WRITE ME RIGHT AWAY IF YOU CAN TAKE ME."

It ended, "GOOD BYE, MYRON MOLCHAN."

Flt. Lt. Harry E. Jones, who is in charge of the recruiting office here, wrote the lad Monday. His letter read:

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**R. C. A. F.**

**K**

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**713 BARRARD STREET**

**MArine 7941**

"Dear Myron:

"It is very good of you to write and offer your services to your country and, no doubt, when you grow up you will make a valuable member of the Royal Canadian Air Force. However, at present you are much too young so that the best advice that can be given you is to go to school, work hard, and then, when you are old enough, you will be able to join the Air Force and learn to fly.

"Thank you very much for your nice letter. You are a good young Canadian with the right outlook."

● Hundreds of airmen at No. 4 Initial Training School and the Radio Technical School, University of Alberta, needed haircuts. They couldn't get them because they had no time except after 6:00 p.m., and all barber shops in Edmonton must close by then. After discussing the problem with representatives of the Master Barber's Union, three city Aldermen and the Mayor, the R.C.A.F. officers said they would establish a barber shop at their own school which would be open nightly for the barbering of the several hundred airmen stationed there.

● Air Marshal W. A. (Billy) Bishop is becoming a motion picture actor for a day when he appears in the first scene of the picture "Captains of the Clouds." In the scene he presides at a wing ceremony in which the stars of the picture, Cagney, Dennis Morgan and George Tobias, take part along with 450 men and 40 planes. The scene will be shot at the service flying training school at Uplands. It is a story of northern Canadian "Bush Pilots" who enlist in the R.C.A.F.

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## ● The Flying Instructor's Dream

To me upon an afternoon a vision was revealed  
As fifty training-aeroplanes careered about the field,  
My pupils landed back to front, they landed upside down,  
But I was lying fast asleep and there was none to frown.  
I dreamed that on a certain course a certain pupil came  
And in the Flight allotment he was drawn against my  
name,

A blackvised rapsallion with a falling lock of hair  
And a stupid little clipped moustache that shouldn't have  
been there.

He said he meant to learn to fly and get it over soon  
As his patience was exhausted with the old man in the  
moon,

He said I'd better hurry up and teach him all I knew  
Or he'd label me for ever as a plutocratic Jew.

He said his name was Shicklegrub, he said it wasn't fair,  
He ripped the Order Books to shreds and tossed them in  
the air,

He bit his parachute in half and screamed in mortal pain  
Till I strapped him up securely in our oldest aeroplane.  
I told him all he had to do was wind the tailtrim back  
And loosen well the throttle-nut to make it really slack,  
I warned him that when taking off the flaps should be  
depressed

And the stick pulled firmly backwards till it hit him in the  
chest.

I begged him to make no mistake before he hit the trail  
But make quite sure the wind was blowing strong behind  
his tail,

I told him that the mixture knob should always be in  
"weak"

And the radiator shuttered off in case it sprang a leak.

I ordered him if things went wrong my good advice despite  
To rudder strongly to the left and bank towards the right,  
To throttle back one engine and to climb at twenty-five  
And then return to safety in a screaming power-dive.

I sent the ambulance away and set its driver free,

I told the fire-tender's crew that it was time for tea,

Then, all my preparations made and all the omens right,  
I authorised Herr Hitler for his first and final flight.

Owen Chave in "The Aeroplane."

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## Reconnaissance---

### ● B-19

The Douglas B-19, the United States Army Air Corps' \$3,500,000 Bomber, did everything asked of it on its maiden test flight from Santa Monica on Friday, June 27. Major Stanley M. Umstead, the American Army's No. 1 test pilot, nosed the huge craft into the air nine seconds after gunning the four motors at Clover Field. He brought it to a slow gentle landing on a long runway at this army air base. Officers were highly pleased at the performance of the giant plane, which was in the air 56 minutes. Major Umstead admitted he might have been a little nervous as he took off in the four-motored bomber, which has a 212-foot wing-spread and a 132-foot fuselage. Aboard were 7 men in place of the ultimate crew of 10. The plane carried less than one-fifth of its 11,000 gallons fuel capacity. Builders' statistics rate it as 41 tons empty and 82 tons fully loaded. The huge fuselage is double-decked. Pilots and other of the normal flight crew of 10 were given stations in the top deck, while positions for the bombardier and gunners were placed below.

A large soundproofed, heated and ventilated bridge deck in the forward and upper end of the fuselage houses the ship's pilot, co-pilot, navigator, radio operator and engineer. Remainder of the normal operating crew consists of a chief mechanic and four relief crew members. Their accommodations include a galley, wardroom and cabin with sleeping quarters for eight on full-length three-quarter wide berths. When used on attack mission the ship would carry extra crew members to man the battle stations.

B-19 . . . the "Hemisphere Guardian."

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### ● Helicopter Flights in U.S.A.

Mr. Igor I. Sikorsky made what is believed to be the first amphibian flight of a direct-lift light aeroplane on April 17, when he took off from the Housatonic River in the Vought-Sikorsky Helicopter VS-300-A (90 h.p. Franklin 4AC-199 motor), hovered over the water for a minute or two and landed on the water. He made four such flights, landing in a nearby field after the fourth flight.

Two days earlier Mr. Sikorsky took off from Stratford, Conn., and for 1 hr. 5 mins. 14.5 secs. hovered over an area of less than 1 acre, after a true, vertical take-off. For the take-off from water Mr. Sikorsky replaced the landing gear with sausage-shaped rubber floats, two under the main part of the helicopter and one at the tail.

The VS-300-A had an all-up weight of about 1,290 lb. for these flights. It can operate from an area of less than 50 ft. square, but 20 or 30 ft. more needs to be allowed in case of an error in piloting.

When a city is the target, it is difficult to miss, even from an altitude of 20,000 or 25,000 feet. But it is quite another thing to hit a ship or a bridge, dockyard, a factory or a power station. The British bombed the cruisers Scharnhorst and Gneisenau at Brest for weeks before they were sure they had made direct hits.

With a helicopter that could hover over its target, it should be possible to attain much greater accuracy. But, of course, the helicopter would be a vulnerable machine. The anti-aircraft guns would get it if it hovered within range, and in the stratosphere it would be easily overtaken by the swift fighting planes.

### ● Fund-raising "Flitfires"

In case you haven't heard, a Flitfire is a light American aircraft engaged in raising dollars for the American branch of the R.A.F. Benevolent Fund which is getting well under way just now in New York.

With their usual flair for energetic organisation, the New Yorkers recently held an "R.A.F. Party" at La Guardia airport, the culminating point of which was the departure of a light plane to every one of the country's 48 States on a fund-raising flight.

And with their even more famous flair for finding a word for it (at which they out-Greek the Greeks!) our good American friends have expressed the co-operative link between their little aerial fund-raisers and the R.A.F. by dubbing them "Flitfires."

\$nappy landings, boys!

### FAMOUS CANADIAN AIRMEN

(Continued from Page 3)

of National Defense, Barker took an informal "flip up" before the actual tests. He was killed in this ordinary flight, with no apparent dangers present.

Barker's amazing flying record, his courage and devotion to duty place him high in the list of Canada's Great Airmen.

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THE AIR FORCE

## I CHRISTEN THEE "VENGEANCE"

(Continued from Page 8)

greater range than any other dive bomber in production.

In discussing the Vengeance, British officials said that "in working with Vultee on this bomber, we have embodied not only the advances in design developed by the Company's engineers, but we have used every bit of experience gained through the use of dive bombers in the war."

The development of the Vengeance from drafting board stages to production has emphasized speed in engineering, testing and actual production. Contract for a large quantity of the bombers was signed just ten months ago by the British on the basis of preliminary studies and specifications developed by Vultee.

Immediately thereafter, Vultee engineers, under the direction of Vice-President R. W. Palmer, began to design the ship for production.

Arrangements were immediately made for increased production facilities, which have now been completed and are in operation.

It was also decided that in the interests of speed, as much of the ship as possible should be built under sub-contract, with the Vultee's own facilities being used principally for final assembly. These sub-contracts have been let.

Materials have been on order for the Vengeance for some time and deliveries have already begun. Deliveries of the completed planes in large quantity are only a short time away.

Company officials stated that the engineering and production of the Vengeance have thus been the result of highly intensified co-ordinated activity in many fields simultaneously to meet the demands of the democracies for advanced combat planes in the shortest possible time.

To speed the development stages of the plane, Vultee made extensive use of such devices as its engine test tunnel, first and only one of its kind in the country. In this tunnel, performance of the plane's engine in relation to this specific design was thoroughly tested, thereby obviating the necessity of many hours of actual flight testing.

Other time-saving methods included simultaneous design and production engineering, so that quantity production by machines might be assured soon after tests were run.

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## UCLUELET

(Continued from Page 6)

in his eye. He is looking for "volunteers" to help clean up the canteen and remove the chairs.

There are the usual number of wits (?) in camp and one of them, nicknamed Pinky, has a trick all his own. Taking an imaginary needle, he breaks off quite a long piece of thread, also imaginary, and proceeds to sew his fingers together and finally his thumb to his fingers. Very slowly the fingers are drawn together as the thread is pulled tight. A stooge then draws a knife from his pocket (invisible to the naked eye) and hands it to Pinky. At this point Pinky severs the "thread" that binds his fingers together and his fingers are finally freed, one from the other.

This trick must not be held against him, however, as it is agreed in camp that Pinky is definitely "bushed."

The poor fellow has been stationed at Ucluelet for months, and that, as everyone will tell you, covers a multitude of sins.

Throughout the camp white stakes mark out the Attention Areas where compliments must be paid to all officers at all times.

One point of discipline which does not require any rigid enforcement in the camp is "Lights Out" at 10.30. There is simply no place to go.

At the entrance to the camp a sign reading "R.C.A.F. CAMP . . . ADMISSION PROHIBITED" warns away the idle and the curious.

One that this does not apply to is the Padre. A tall, spare, and kindly man, he is in and out of the barracks almost daily, perched on the edge of one man's or another's bunk, passing the time of day. He has a small frame church in the village, the smallest church I have ever seen and probably the most modest place of worship in the world. He is usually to be met walking along the road between the camp and the village, walking with a long stride and puffing furiously on a black briar pipe.

A few miles from Ucluelet, along the Tofino Road, Long Beach stretches for many miles. A perfect spot for Sir Malcolm Campbell, the forces of Nature have combined to provide a salt flat with a surface as flawless and smooth as a modern paved highway.

The peace and beauty of the rugged landscape, the wild rock-bound coast and snow-crested mountain peaks seem a far cry from the volcano that is present-day Europe. It would be easy to surrender to the feelings of peace and sleep in the quiet countryside.

But constant awareness is the watchword.

Rifle range practice for all airmen prepare them for any possible attack on this strategic air base. Every airman must be capable of "digging in" if the necessity arises. For aircrew constant practice in air-firing at military "objectives" keeps the air gunners at a high level of accuracy. Formidable looking eggs in the bomb carriers of the Stranraers forebode death and destruction to the invader.

By means of modern radio communication a closely knit military organization of all coastal stations is made possible. Emergency situations may be dealt with by split-second decisions from Western Air Command.

The air base at Ucluelet is manned by pilots who know every stream and mountain, every inlet and every reef along the coast. They are the former commercial and "bush" pilots who brought civilization and the tools of civilization to the North and to the wilds of British Columbia; to all those out-of-the-way places barred, by climate and geography, from the normal means of communication and transportation. They are the men who were foremost in the building of Canada and are determined it shall remain a human and happy place in which to live.

It has been decided by Western Air Command that the men will not be required to stay any longer than six months at "Ukelele", or any other air base cut off from the outside world. In order that they do not become "bushed" they are transferred to the Prairie Flying Schools at Regina and Dauphin, the Air Observers' Navigation School at Rivers, the Bombing and Gunnery School at Mossbank, or to Vancouver and Victoria.

Replacements will taste the salt and sting of the stormy Sound and will see for the first time the white mist that is like a blanket of fine wool upon the fir-covered mountain sides of the channel. New men will come to know the steady beat of rain in a rain-soaked country.

The men who leave will be a long time forgetting the days and the months that they were "bushed" on Vancouver Island and the work and companionship that was their life at Ucluelet, Canada's outpost of Empire.

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## PLACES and PERSONS

### ● Victoria Cross

The Victoria Cross was conferred July 21 on Acting Wing Commander Hugh Idwall Edwards, F.F.C., an Australian serving with the Royal Air Force bomber command.

### ● Luetzow

A British Bomber flying team consisting of three Royal Air Force men and their Canadian air observer, Sergeant A. H. A. Morris of Nokomis, Saskatchewan, who have been flying together since March, damaged the German pocket battleship Luetzow with an aerial torpedo. They were flying a Bristol Beaufort bomber which they have called "The Wreck" and which bears the mark of their previous successes over enemy aircraft, including a Heinkel bomber.

### ● Rotterdam

The British Air Ministry's news service, of July 17, in writing of the fierce Royal Air Force raids on Rotterdam of July 16, said the captain of one bomber, a Canadian officer from Ottawa, was forced to fly between a high wireless aerial and the ship's mast to attack the largest vessel in the harbour, a liner of some 17,000 tons. The bombers then hedge-hopped across the fields of the Netherlands in "V" formation on their way to their targets.

### ● Sergeant Air Gunner K. J. C. Wadsworth

. . . of Queensland, Australia, broke his back last winter in a skiing accident near Banff. After long weeks in Hospital he completed his course of training at No. 2 Bombing and Gunnery School, R.C.A.F., Mossbank, Sask. He flew and went to classes with his spine encased in a heavy cast. At the completion of his course he received the winged badge of a wireless air gunner and returned to Australia for further medical treatment.

Corporal J. Scott of Vancouver and Flight Sergeant D. H. Nelson of New Westminster were among the Air Force personnel who arrived back in Canada on July 21 to assist as instructors under the British Commonwealth Air Training Plan. They emphasized the high spirits of the British people under wartime conditions.

Pilot Officer Gregory A. Daymond, "baby" of the Eagle Squadron—American Volunteers in the R.A.F.—is Britain's new Air Hero following a battle over Lille, France. He tackled two German planes, and shot down one despite his own ship being badly damaged in the dog-fight.

### ● R.C.A.F. Press Officer

Appointment of Adjutor Savard, member of the Parliamentary Press Gallery for Le Canada of Montreal and Le Soleil of Quebec, to be Director of Overseas Public Relations at Royal Canadian Air Force Headquarters in Great Britain, was announced in Ottawa on July 15.

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An application for permission to establish a United States to Alaska passenger and freight flying service was filed with the Civil Aeronautics by the Western Air Lines, which would operate the 3500-mile route to Nome, Alaska. The present air route, which ends at Lethbridge, Canada, would be extended 2550 miles to Nome and Anchorage, Alaska, via Fairbanks, Alaska, and Calgary, Grande Prairie, Whitehorse and Edmonton, Canada. Air traffic would be limited to international service with no service between Canadian cities.

No serious damage was done by the fire which broke out in a building used by the Commonwealth Air Training Scheme at Edmonton, Alberta, on July 13.

Regina.—On a per capita basis Regina's Royal Air Force recruiting centre stands first in all Canada for its present rate of enlistments, Squadron Leader B. F. Woods, representing the director of Air Force manning at Ottawa, said in an interview here.

London.—The air ministry news service told how a 25-year-old Spitfire pilot with a bag of 24 German planes to his credit "helped two Messerschmitts destroy themselves without firing a shot."

The pilot was escorting bombers to a raid on Brest when he was attacked by the two German planes which he said "came at me on either side in a dead straight line.

"I side-slipped quickly and they hit each other head-on," he said. "There was a terrific impact as the planes crumpled up before crashing into the drink."

Ottawa.—More than 2000 women will be required for the Canadian Women's Auxiliary Air Force which will be completely organized within two months, Royal Canadian Air Force headquarters announced July 25.

Montreal.—Captain Joseph Mackey, trans-Atlantic pilot who survived the Newfoundland crash last winter in which Sir Frederick Banting was killed, is back on his job of ferrying bombers to Britain, it is learned.

● **Mother Goose Revised**

There was a crooked man, and he had a crooked style;  
He raised a crooked mustache and smiled a crooked smile.  
His flag a crooked cross, he published crooked facts,  
And built a crooked Europe with his crooked little pacts.

—Mazie V. Caruthers in New York Times.



*See Bert Bridgman*  
WHEN HE VISITS YOUR  
DEPOT THIS FALL FOR  
YOUR PHOTOGRAPHS  
FOR CHRISTMAS

*Bert Bridgman*

876 HOWE TREET  
VANCOUVER, B. C.

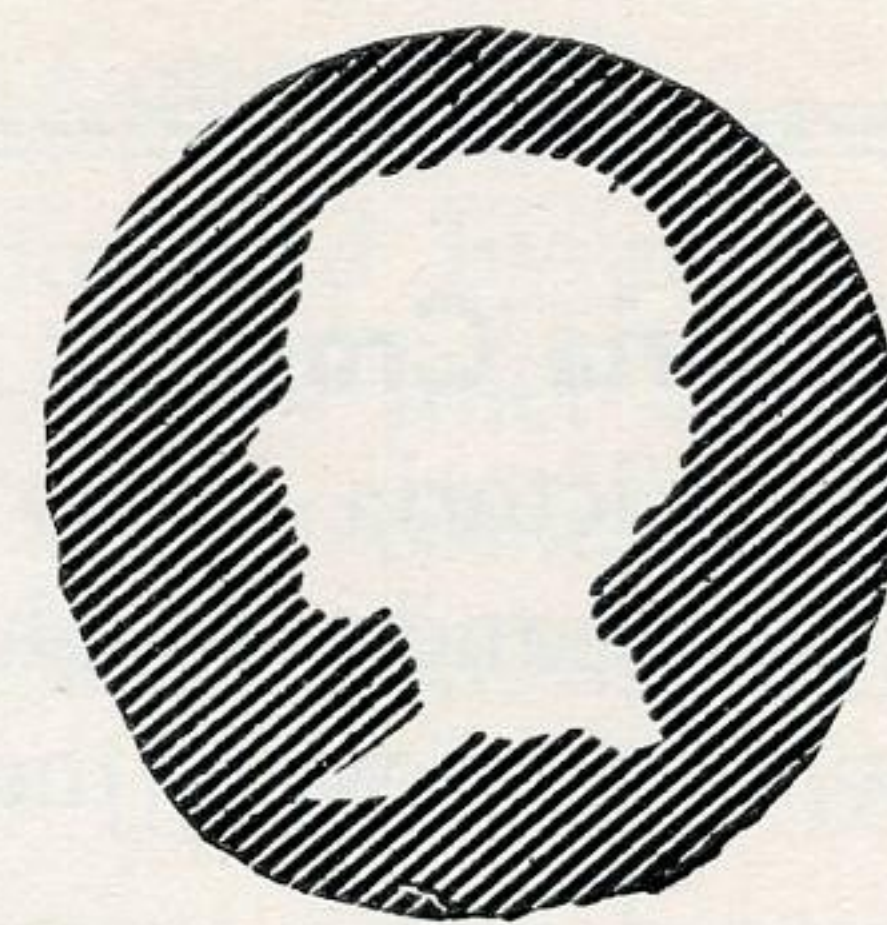
GRANDMA

SWEETHEART

SISTER

MOTHER

THE GIRL FRIEND



WILL

APPRECIATE

A

GIFT CERTIFICATE

ON

BIRTHDAYS

MOTHERS' DAY

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