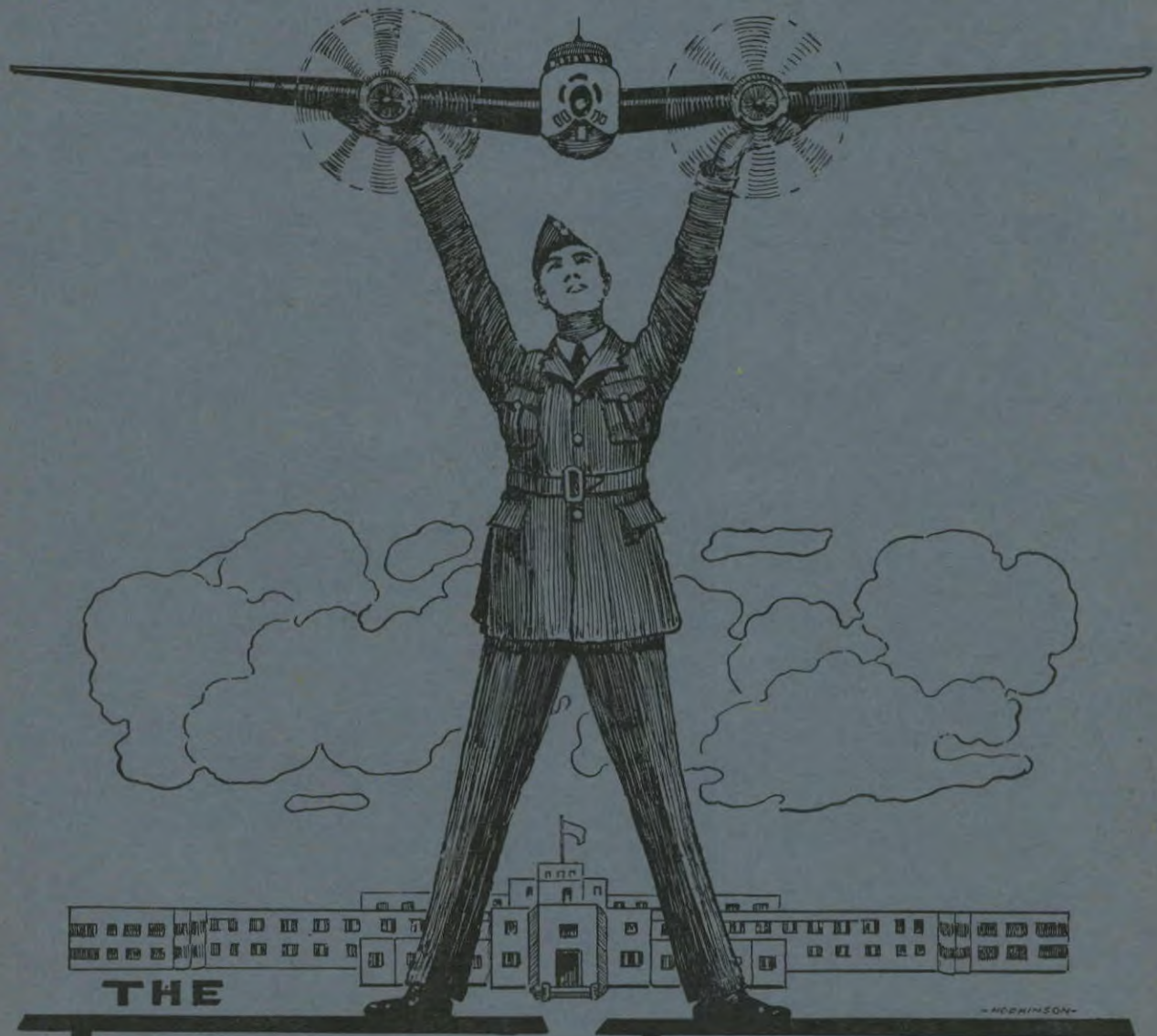


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**TECHNICAL TRAINING
SCHOOL**

ST. THOMAS

ONTARIO



THE AIRCRAFTMAN

A Magazine of the R.C.A.F. Technical Training School
Published Monthly at St. Thomas

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Come Then, Let Us To The Task, To The Battle and The Toil

*Each to Our Part, Each to Our Station, Fill the Armies,
Rule the Air, Pour out the Munitions, Strangle the U-Boats,
Sweep the Mines, Plough the Land, Build the Ships, Guard
the Streets, Succour the Wounded, Uplift the Downcast and
Honour the Brave.*

*Let us go forward together in all parts of the Empire, in
all parts of this Island. There is not a week, nor a day, nor
an hour to be lost.*

*Mr. Winston Churchill, the Prime Minister,
in a Poster Issued by the British Government.*

« « EDITORIALS » »

THE WILL TO WIN

On the whole, the British people are not given to boasting. They have no need to boast. The history of the last thousand years has taught the British people a confidence which does not need the bolstering effect of blustering words. It is true that we have been accused of just "muddling through" and our enemies mistake our confidence for smug and senile complacency. But we know the foundation on which that confidence is built. We build on the enduring stability of the British ignorance of the meaning of quitting.

It is well to remember these things. There may be a temptation to become somewhat discouraged in the face of the events of the last year. The expansion of German influence over most of western Europe would give the casual observer the impression that the successes of the campaign had all been on one side. But the mere acquisition of the power to suppress minorities and the means of material production, important though they be, are void of lasting worth unless the people have the will to win.

And so it is that Hitler finds himself under the necessity of providing supervision and provisions for millions of people who are antagonistic to his purposes. He is burdened by the alliance with a country whose leader has not the wholehearted support of his own people. He is continually faced with the threat of insurrection. It is not necessary to execute liberated people, as did Hitler with the Polish students. Nor have the people of Czechoslovakia any desire to see Hitler win. Recently a bomb dropped by a German plane over London was found to be filled with sand and this note was inside: "Made in Czechoslovakia — fill with powder and return to Berlin." Surely there is no further proof needed to show that many of Hitler's conquests are more liabilities than assets.

The people who will win this war are those who practice the right of freedom; whose lives are meaningless without freedom and whose indomitable spirit will surmount the difficulty of initial lack of material equipment. The British have this spirit. They count not the cost. They do not boast. They know that they will win and in quiet confidence they face the difficulties and trials of the task before them.



Group Captain Reginald Collis

* * *

THE COMMANDING OFFICER

Group Captain Reginald Collis, Commanding Officer of this Station, has had a long and interesting career in various branches of the Air Force. In his 28 years of service he has played many parts. He contributed acceptable service first as a mechanic, then as technical instructor, pilot, flying instructor, fighter pilot, test pilot, officer in charge of engine and technical instruction, and officer commanding various schools and stations throughout Canada.

His experience in aviation began in England in 1909, when he was sixteen years of age. In that year he was loaned by the Blackpool and Fyde District Aero Club, of which he was a member, to Mr. T. Lumb, and served as mechanic to his Bleriot monoplane during the Blackpool Aviation Meeting. On the formation of the Royal Flying Corps in 1912 he enlisted in this branch of the Service and was classified in August 10 of that year as a first class air mechanic. His first flight was with Lieutenant A. Longmore, R.N., now an Air Marshal, and on qualifying for his wings in

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January, 1913, was employed as assistant flying instructor to Lieutenant Longmore.

In 1914, the year war was declared, Aircraftman Collis was promoted to Corporal and later to Sergeant. On May 3, 1915, he reported as an active service pilot to St. Omer in France and was attached to No. 7 Squadron. Later in the same year he saw service with No. 16 Squadron stationed at Chocques and on June 15, while observing enemy artillery positions, sustained extensive damage (right out) to his aircraft and made a forced landing. For services rendered he was promoted to Second Lieutenant, East Surrey Regiment, and seconded to the R. F. C. as Flying Officer, June 29, 1915. In 1916 he disabled and brought down a German raider at sea 12 miles northeast of Deal. A month later he sustained serious injuries while testing one of the first armor protected British aircraft. This same year brought a promotion to Lieutenant of the East Surrey Regiment. In 1917 he was transferred to No. 4 School of Aeronautics, Toronto, Canada, and was employed as officer in charge of engine instruction and officer commanding Men's School of Technical Training at Leaside.

In 1923 he accepted a commission in the Canadian Air Force with the rank of Flying Officer and was posted to Camp Borden. His appointment to Flight Lieutenant came in 1925. A voluntary parachute jump from an Avro about this time added to his experience. Western Canada claimed his services in 1926-27. During this time he was Officer Commanding, No. 2 Squadron, High River, Alberta. The Royal Aeronautical Society in 1929 elected him an associate member. Following his appointment as Squadron Leader in 1934, he was made Commanding Officer of Camp Borden. At the outbreak of war he spent several months as Officer Commanding, Manning Pool, in Toronto, and on 13th January, 1940, was appointed Commanding Officer of the Technical Training School, St. Thomas. His appointment to Wing Commander in 1938 was followed by a Group Captaincy on June 15, 1940.

The enthusiasm of Group Captain Collis for the Air Force is reflected in his family. Two of his sons are serving in the R. C. A. F. One is a Corporal in England, the other a Corporal posted to an Aeronautical School in Montreal.

When off duty, Group Captain Collis is most enthusiastic about animals, as illustrated by the support he has given to greyhound racing throughout Canada. He is an inveterate reader not only of the classics but also engineering periodicals and the like. He has an inventive mind and has made many articles

which have proven very practical. He is very much interested in all branches of Youth Training. He has always been an ardent sport "fan" and he was an excellent sprinter. We received a demonstration of this in our Sports Week last summer when he finished a close second in the Officers' race.

The Group Captain cherishes a hearty belief in the rightness of our cause and as the headmaster of Canada's largest Air Force Training School he is proud of the fine quality of the officers and men who serve under him.

* * *

Christmas

By Padre Davies

Wending their way along the rugged hills of Judea, on a cold winter's night, was a company of men, women and children. They had gathered from points afar to travel toward their native towns and cities. It was the year of the great tax — the year of registration, in order that the government might know the whereabouts of the people.

The group in which we are interested was proceeding toward the royal city of Bethlehem of Judea — the city of David the great king. On beasts of burden and on foot they journeyed, spending long days on the road and taking as little time as possible for the night's rest. The day at last arrived when the welcome sight of Bethlehem came into view, and with the usual rush, each one sought a resting place for himself and for his family.

Among the company was a man named Joseph, together with his espoused wife, Mary. They went from place to place seeking shelter for the night, but said shelter could not be found. At last a considerate inn-keeper gave them the only place available — a stable. It was there where the Christ, the Son of God, was born.

A glorious night — so typical of the eastern lands — welcomed the earthly visit of the Son of God. The Angelic Host sang their hymn of praise—

*"Glory to God in the Highest,
Peace on earth, good will toward men."*

The simple shepherds tending their flocks on the hill-sides were thrilled at the sight of a scene so grand. They went to Bethlehem to see what gift had been given to mankind. Not to a great hotel, nor a fine house; to no grand palace, nor even to a humble cottage, did they

go, but to a simple stable. There in all the poverty of such a place did they find Joseph, the Blessed Mother and the Infant Child Jesus. With spontaneous reverence they worshipped the Holy Child.

The very centre of all our Christmas observance is found in the fact of the birth of the Son of God. Because He was born, we hold the feast, and although the season has been commercialized with business activity, we still cling to the basic truth that if there had been no Christ child there could be no Christmas. It is well, then, for us to recall that the day is not only one of jollification and celebration, through the exchange of gifts, the glad homecomings, the Christmas dinner and so on, but that it has its root in a great Christian fact. That truth must remain uppermost in our minds.

Especially to those of us in the Service has this reality come to light. We are surrounded with the great facts of life — service, sacrifice, devotion and loyalty are what we thrive and live upon. All of these come to light from a deep sense of the righteousness of our cause. The basic principle wrapped up in the life and teaching of the Babe of Bethlehem are being attacked with a viciousness which would have them destroyed. We, with our Christian ideas, will not allow such to take place — Christmas means too much to us — our Holy Religion is enshrined in these virtues. Let it take all we possess, in life, in money, in business, in family relationships — ours will be the privilege of defending these inheritances at all costs.

Our inspiration comes from the first Christmas Day — the gift of the Son of God — and gives to us, and to all mankind, not slavery and servitude but freedom of the abundant life.

It is, therefore, our opportunity to manifest the Christmas Virtues in the Christian life. We may be deprived of the privilege of being home for Christmas; if that is our service, we will gladly fall in line with it — Christ came to a manger. It may be we shall not have all we think we should, this Christmas — we will make the best of it — the Son of God had only a stable. It may be we shall have to prepare ourselves for greater sacrifice — we shall gladly meet such in the Spirit of the Holy Babe — He had to prepare Himself for His Calvary.

Come what may, this Christmas, though devoid of peace on earth and good will among men, will be just as real, just as good, just as happy for us as any, because we, in the Services, are among those privileged to uphold the high and noble qualities which come to us through the gift of the Babe of Bethlehem. We

shall measure up to all that is required of us gladly, willing and happily.

With life before us thus, ours will be a glorious Christmas and in a fine comradeship we shall join in the welcome greeting

*"A HAPPY AND HOLY CHRISTMAS
TO ALL."*

* * *

**EXCERPT FROM A BROADCAST
BY MISS DOROTHY THOMPSON
TO THE MEN AND WOMEN OF
CANADA, JULY 21st, 1940**

"In your speech this week, Mr. Hitler, you said that it caused you pain to think that you should be chosen by destiny to deal the death blow to the British Empire. It may well cause you pain. This ancient structure, cemented with blood, is an incredibly delicate and exquisite mechanism, held together, lightly now, by imponderable elements of credit and prestige, experience and skill, written and unwritten law, codes and habits. This remarkable and artistic thing, the British Empire, part Empire and part Commonwealth, is the only world-wide organization in existence, the world equalizer and equilibrator, the only world-wide stabilizing force for law and order on the planet, and if you bring it down the planet will rock with an earthquake such as it has never known. We in the United States will shake with that earthquake and so will Germany. And the Britons, the Canadians, the New Zealanders, the Australians, the South Africans, are hurling their bodies into the breach to dam the dykes against world chaos."

* * *

THIS WAR AND THE Y. M. C. A.

When war was declared on September 3rd, 1939, the Canadian Y.M.C.A. on the same day advised the Prime Minister that their complete resources were behind our nation in its war effort. It was only a matter of days until it was made known that the facilities of the Y.M.C.A. throughout Canada, including its gymnasias, apparatus, indoor tracks, showers, pools, interest groups, etc., were available, free of charge, to the men in uniform. To put it

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briefly, the Y.M.C.A. offered to the Government the resources in equipment and leadership which had been built up through 89 years of social service experience.

The plan from the beginning was to bring to the men in the Service the full Y.M.C.A. programme with its four-sided emphasis: physical, intellectual, social and spiritual. In addition to the work carried on by the established branches, trained men were selected to promote Y.M.C.A. programmes in military camps.

When the Y.M.C.A. volunteered its services, it had more in mind than the mere expansion of programmes. It saw an opportunity to fight a less glorious battle against the effects of war, with its horrible shocks that have such devastating repercussions on the human personality. To this important phase of our war effort the Y.M.C.A. brings its resources, which have been the result of many years of social study and research.

Through development of programme and personal counsel, the Y.M.C.A. is seeking to aid the man in the Service to formulate a scale of values, and at the same time help him to hold a perspective in a confused world. Furthermore, the Y.M.C.A., along with the other auxiliary services, is struggling for the preservation of those qualities of citizenship essential for the success of democracy. It is obvious that a democracy can survive only if its citizens possess a good measure of initiative, along with the ability to think clearly and to be willing to co-operate for the common good. Consequently, we find the Y.M.C.A. interested in organizing libraries, debating societies, service newspapers, dramatic groups, amateur nights and other forms of self-expression.

In military life there is little opportunity for the exercising of democratic principles. Regimentation over a long period might seriously impair the development of those qualities essential for a healthy democracy. Our Government is fully conscious of these dangers, and it hopes to counteract this tendency through the intelligent organization of auxiliary services.

The Y.M.C.A. is the only one of these auxiliary services having permanent representatives on this Station but the closest co-operation is maintained with the other groups in order that the men may be served to the best advantage during the period of their enlistment. — E. M.

* * *

INTEREST GROUPS

I attended a meeting of the Camera Club the other night. Under the leadership of a

visiting speaker, the discussion became quite interesting. At least, the bona fide members found it interesting. Personally, I had not the foggiest notion of what it was all about. I would have felt more at home in a meeting of medieval alchemists. Perhaps the fact that developing, as far as I am concerned is something which takes place between the time when a roll of films crosses the druggist's counter and the time at which the prints are ransomed, explains my lack of comprehension. But that meeting did me some good. It made me realize how large a part "interest groups" should play in the off-duty hours of Station life.

Most of us had our hobbies and individual vocations in civilian life but when we get into the Service there is a danger that the multifarious duties provided by the benevolent but sometimes incomprehensible powers that be may tend to force us into a uniform mould. This would be a real disaster. There is nothing more tragic and pathetic than a person who has lost all individuality. Fortunately, this danger is easily overcome. Form or join an interest group. Keep your individuality by having interests outside of your duties. It does not matter if your interest is in sketching, stamp collecting or miniature railways, there are kindred souls around you. Gather them in; organize and escape the mould. — D. S.

* * *

THE TORCH WELL CARRIED

By Cpl. W. M. Stanley

Hitler has claimed that the British Empire is in a state of decay. He has claimed that its youth is decadent and not fit for the task of playing an important part in the destiny of civilization. What a shock he must have experienced! The heroic stand of the Empire, when it has seen its allies overcome until it stands as the bulwark of freedom, shows beyond all shadow of doubt that the Empire is not going to collapse, neither is its youth effete. It is strengthened by the strength of its own youth and of the youth of other nations which have regard for the only principles of life which can hope to have more than transitory existence.

Men and women from the East, the West, the North, the South; from the prairies, the plains, the woods, from the shores of the Atlantic to the Pacific, from the frozen North to the sunny South; yes, even from the United States came stalwart lads to join with our own and to serve our Empire. Doctors, lawyers, clergy, clerks, mechanics, electricians and even from the ranks of the unemployed — Jews, Catholics, Presbyterians, Methodists and An-

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glicans; Indians, Americans, French, Dutch, Poles, Scandinavians, Czechs and even free Germans — all these and thousands more swell our fighting forces, all fighting for the cause of Freedom and Democracy. These men and women are the symbols of the strength, courage and grim determination of the youth of today. To stamp out tyranny, they give up homes and are willing to sacrifice their lives.

* * *

DER FUEHRER'S PRAYER

Gott, Gott, dear Gott, attention please,
Your pardner Adolph's here
Und has a word or two to say
Indo your private ear;
So durn away all udders now
Und listen vell to me,
For vat I say concerns me much,
Meinself und Shermamy.

You know, dear Gott, I vas your friendt,
Und from mine hour of birth
I quietly let you rule the Heffen
Vile I rule o'er der Earth.
Und ven I told mein soldiers
Of by-gone battle days,
I gladly split der glory
Und gave you half der praise.

In every vay I tried to prove
Mein heart to you vas true,
Und only claimed mein honest share
In great deeds dat ve do.
You could not half a better friendt
In Sky or Land or Sea

* * *

Dan Adolph Hitler number vun,
Der Lord of Shermamy.

So vat I say, dear Gott, is dis:
Dat you shouldt still be friendts
Und you shouldt help to send mine foes
To meet deir bitter endts.
If you, dear Gott, vill dis me do
I'll nothing ask again,
Und you and I vill pardners be
For evermore — Amen.

But list, Gott, it must be quick
Your help to me you send,
Or else I half to stop attack
Und only play defend.
So four und twenty hours I gif
To make the Allies run
Und put me safe into mine place,
Der middle of der Sun.

If you do dis I'll do mine part,
I'll tell der vorldt der fact—
But if you don't den I must tink
It is a hostile act.
Den var at once I vill declare
Und in mein anger rise,
Und send mein bomber ships to vage
A fight up in der skies.

Dis Ultimatum now, dear Gott,
Is von of many more;
Mein mind is settled up to clean
Der whole vorldt off der floor,
Because you vas mein pardner, Gott,
An extra shance is giffen,
So help at vonce, or else I'll be
Der Emperor of Heffen.

* * *

« « SPORTS » »

HOCKEY SEASON OPENS

Old Man Winter is here again and so is hockey. As far as this station is concerned, the big show starts on December 2nd, when the boys will have a chance to show what they can do against the University of Western Ontario. Then the round of inter-squadron games gets under way. The rinks are under construction and all that is needed is a little co-operation from the weather man.

Now is the time for all good men to come to the support of their teams. Dig out the skates; brush off the pads and get the ankles working. There is room for every last A. C.

If you can't skate, you can yell, so get out and whoop it up!

* * *

DRILL HALL SPORTS

One of the changes in Station Routine which seems to have met with general approval on the part of the men is the introduction of the daily period of what is officially known as Compulsory Sports.

The organization of this period has been carried out by the Squadron Officers and WO/1 Stubbs in co-operation with members of the Y.M.C.A. staff. The persons concerned feel

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well satisfied with the progress made.

The period of games following the demonstration of "mind over matter" is generally enjoyed. Men who have never seen a volleyball before are rapidly becoming experts on the finer points of the game and there is little doubt but that the general standard of sports will be raised as a consequence.

The muscle men gracefully retire "on the double, there" to the boxers' corner and under the gentle ministrations of Mr. Sacks are rapidly becoming serious threats to the welfare of boxing teams of other Units.

It is hoped that in the near future additional gymnastic equipment will be available and tumbling and apparatus work will have a part in the afternoon programmes.

* * *

SQUAD 2, WING 2 GAINS RIGHT TO HOLD COVETED TROPHY FOR NOVEMBER

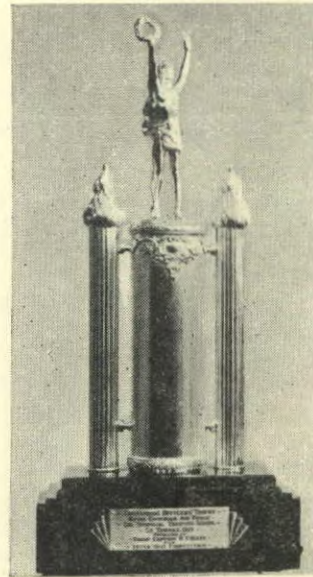
Squad 2, Wing 2, achieved a truly remarkable reversal of form when it rose from the last position in the competition for the Commanding Officer's Trophy to win the competition held during October. The win was no mere accident. This squad compiled the greatest number of points ever awarded in the history of the Trophy (20½) and had a clear margin of 6 points over Squad 1, Wing 1, which was in

second place, a position which it occupied the previous month.

Hearty congratulations to the officer and men of Squad 2, Wing 2; may your example be a challenge to the rest of the Station.

Results:

WING 1			WING 2			E. & A.T.S.
Sqd. 1	Sqd. 2	Sqd. 3	Sqd. 1	Sqd. 2	Sqd. 3	
14½	2	1	2½	20½	3½	8



Commanding Officer's Trophy

« STATION STATIC »

JUST RAMBLING IN SQUADRON 3, WING 1

By "TEX" PEARCE

The boys here in the 3rd Squadron haven't given me much co-operation with the news so far. Come on, boys, spill the dirt and ye old reporter will spread it via the "Aircraftman."

Flash—The 27th entry is still behind that proverbial little old 8 ball.

We hear that there are a bunch of skunks around here? What about it, Flight???

Wonder who the wise lad is that likes to tear down signs in the 3rd Squadron???

There sure is a lot of talk about our Christmas holidays. There is still a lot of mystery about them yet.

Will someone kindly donate a package of cigarettes to the orderly room Corporal so he won't have to borrow, at least for one day?

When bigger and longer meal parades are held 3rd Squadron will still be there at the end—"We hope it is the front end—but, then, alas!"

Heard in the Orderly Office:

Is there anyone here at night?

Yea! About 450 other guys!

Hey! You lads with the cameras! There is a Camera Club here. Join in the sport we have. Meetings are held every Wednesday night at 1830 hours. Don't be bashful—come on in and join.

AND YOU ABSENT MEMBERS—Your shining faces are expected to be among the

present next Wednesday.

By the time you read this the boys will be installed in Mossbank. Hope they don't have to dig their planes out of the dust. Luck to you, boys, in your new home!

It seems as though "The Aircraftman" is reaching out and taking in new country all the time. Here is an extract from a letter from Gunner Hertel, of Petawawa, Ontario, to his brother, Corporal Hertel, of No. 3 Squadron, No 1 Wing, here at the School:

"The Aircraftman which you sent me is certainly a fine piece of reading. The Editorial Staff deserves a lot of credit."

Come on, boys, let's let the whole country hear of our paper. It is something to be proud of!

* * *

"CHANGING THE GUARD"

It appears that the other day a lowly civilian was stopped by a guard. The civilian trembled and squinted down the barrel of the rifle.

"But, sir, I have a pass."

To which statement the guard, always a gentleman, answered: "Here, hold my gun while I read it."

* * *

IT'S THE TRUTH!

That today the airplane is the safest means of transportation, according to actual figures.

* * *



"THE AMATEUR NIGHT"

By AN AIRMAN

It was a mad rush. Shifting of scenery, pushing pianos, trying to get the loud-speaking system ready, arranging of seats and then someone said, "We are having an Amateur Night." At 2000 hours the brass band, under the baton of Flt./Sgt. Green, broke forth with music which reverberated through the spacious drill hall. Then the pipers wailed their laments and the Airmen, by this time one thousand strong, were applauding with great gusto. The show is on and what have we got? AC/2 Burke, the M.C., took over the microphone and under his able leadership the show progressed. "Do we want another Amateur Night?" the maestro said at the end of the evening's performance. The tremendous applause was the answer. It was amazing the talent that was discovered; no rehearsals, but one by one, and two by two, the artists came to the front, all anxious to give their fellow Airmen entertainment. It was that grand happy gang feeling which counts a lot in the lives of we Airmen. After a busy day in the school there is no better tonic than the relaxation of good fun and entertainment, and did we have it? "Oh, Boy!" There were the two pianos, the ivories tickled till they laughed, by Garland and Patterson of E. & A.T.S., community singing which went over with a bang. Who ever said the Airmen of St. Thomas couldn't sing! Just imagine the whole school on a national hookup—wouldn't Canada be proud to hear them.

Well, there were instrumental trios, vocal solos, accordion players, impersonators, comedians, and as we have not time to give them all a plug individually, we know who they were.

THE AIRCRAFTMAN

Keep it up, boys, the gang is right with you. The good old Y.M.C.A. dug down in its pocket again and gave cash prizes to the five best and it sure helped some of us to get to that dance last Saturday night. Well, here's hoping we have a lot more concerts with talent taken right from our own happy gang of Airmen and that Maestro sure must have spent some time in putting the show on. Good old curly-headed Maestro!

* * *

Sgt. Major 1: "Last night I dreamed that I was being bitten by animals. What does that indicate?"

Sgt. Major 2: "That your mattress would make a good bonfire."

* * *



Is This What You Want?

* * *

French-Canadian S. G.: "Stop! Who am I?"

Officer: "What did you say?"

S. G.: "Stop! Who am I?"

Officer: "But, my man, that is wrong. You should say 'Halt, who goes there?' or else, 'Who are you?' not 'Who am I?'"

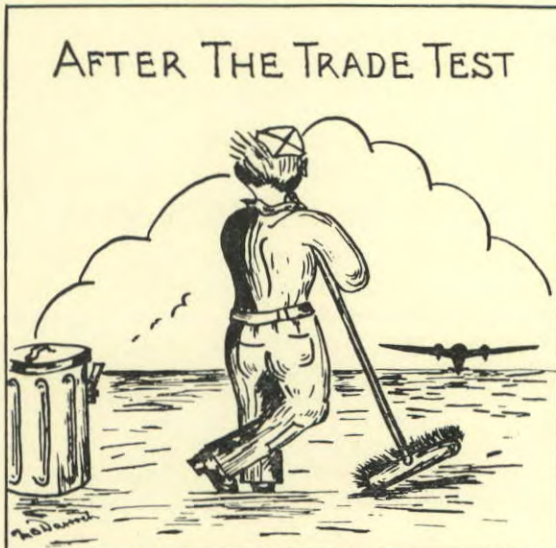
S. G.: "You don't know who I am; I don't know who you are. Stop! Who am I?"

* * *

"May I present my wife?"

"No thanks, I have one just like her at home."

* * *



* * *

AN AIRMAN'S SWEETHEART'S PRAYER

I thought that you would like to know
That someone's thoughts go where you go,
That someone never can forget
The hours we spent since first we met;
That life is richer, sweeter far
For such a sweetheart as you are.
And now my constant prayer will be
That God will keep you safe for me.

* * *

Airman 1: "I'm going to paint Montreal red on my next leave."

Airman 2: "I'm going to the farm to spray Paris green."



STATION ACTIVITIES

STATION LIBRARY

By A. C. Bailey, C.

One of the major concerns of the Library Committee is the problem of coping with the increasing demand for books, made by the air-men. Since this demand is a gratifying demonstration of the appreciation of the men, every effort is being made to meet the requests. During this past month, the number of available books has been increased greatly and subscription has been made to a large and varied assortment of magazines. Under the direction of a permanent civilian librarian, the library is being expanded and reorganized.

This large demand makes it necessary that the books should be circulated freely, and in order that your memories may not become too lax, a small fine is imposed on overdue books. Really there is no necessity for anyone to have to pay a fine since the books can be renewed. So check the return date on your book and escape the necessity of composing a sob story for the benefit of the librarian.

* * *

EDUCATIONAL COURSES

Having in mind the difficulty experienced by many ex-servicemen in readjusting themselves to the condition of civilian life after the Great War of 1914-18, the Canadian Legion has made it possible for men in the services to register in correspondence courses which cover subjects up to Junior Matriculations standard.

In view of the fact that the Legion has no permanent representative on this Station, the registration in these courses and the organization of classes of instruction has been conducted by the Station Y.M.C.A.

The interest of the men is shown by the fact that over two hundred have registered in the various courses. It is expected that many more will register and those interested are urged to discuss the matter with any member of the Y.M.C.A. staff.

It is important to remember that these courses are continued wherever the person registered is posted.

* * *

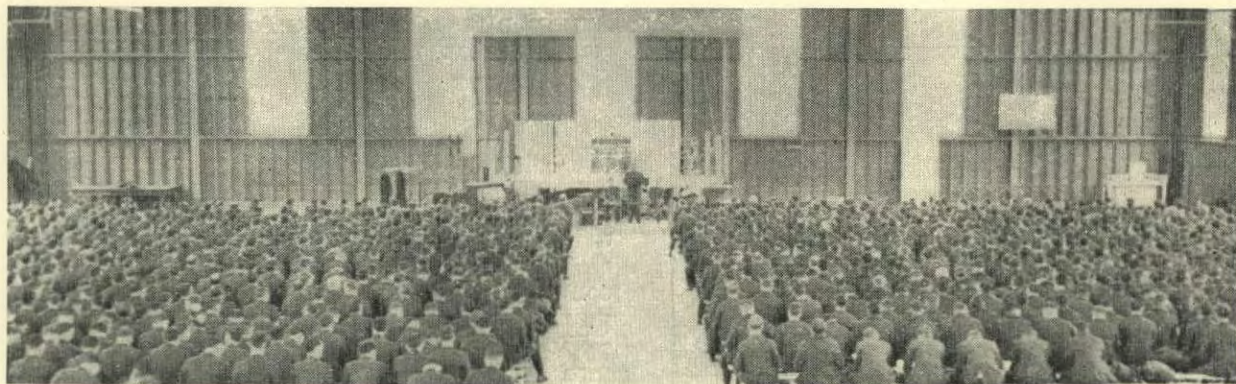
THE CAMERA CLUB

It is possible that camera fans suffer from some kind of infectious disease and perhaps this is the explanation of the enthusiasm and energy of the R.C.A.F. Camera Club of St. Thomas.

From the time of its organization, in May 1940, until the present, the Club has continued to expand its membership and equipment until it is now able to realize its purpose of aiding any person connected with the Station in bettering his practical and theoretical knowledge of photography.

The activities of the Club include weekly meetings with visiting speakers and nightly sessions of developing and enlarging. No

ARMISTICE DAY SERVICE AT THE SCHOOL



THE AIRCRAFTMAN

camera fan can afford to stay away. Remember this, A.C's come and A.C's go but the Camera Club goes on forever.

Join now — you are most welcome.

* * *

The Y.M.C.A. staff of this Station was expanded recently by the appointment of Don. Stuart. Mr. Stuart was previously engaged in various phases of church work. In the past he has served as a missionary in the gold fields and as chaplain in one of the provincial reformatories.

It is hoped that his special interest in music and entertainment will further augment the programme of the Y.M.C.A.

* * *

“SEZ WHO?”

By A Bloke of 2 Sqdrn., 2 Wing

Riding on the crest of their new superiority in sports, Squadron 2, Wing 2 has let it be known that they are willing to accept the challenge of any other squadron at any sport on the calendar. The challenge is even extended to include “any activity.”

We are not sure where the line is drawn but it appears that the winning of the Commanding Officer's Trophy certainly has a tonic effect on the spirit of a squadron. Since this is the case, may we suggest that other squadrons seriously consider the advisability of having a dose of this same tonic.

« DO YOU KNOW? »

That a Christmas Entertainment and Party for the children of airmen is being held under the direction of Mrs. R. Collis, wife of Group Captain Collis? Airmen who have children from 4 to 12 years of age are asked to get in touch with the station Y. M. C. A. A good time for the kiddies is promised.

* * * *

That you are invited to the Discussion Groups for airmen, held in the old Y.M.C.A. Offices every Sunday evening? Come out and settle the fate of humanity.

* * * *

That everything possible is being done to promote bigger and better Variety shows? The success of these shows depends on your co-operation.

* * * *

That Padres Howard, Davies and Porter are most happy to have airmen drop into their offices for a chat?

* * * *

That over twelve hundred books were loaned from the station library last month?

* * * *

That you are invited to join the Fencing Club which meets every Monday and Wednesday. For particulars, please inquire at the Y. M. C. A. Office.

* * * *

That the Baptist Church invites the Airmen to attend their Fireside Hour held every Sunday evening following the service.

That Airmen desiring accommodation for their wives and families in St. Thomas may secure a list of rooms for light house-keeping, apartments and vacant houses from Padre Porter, Padre Howard or E. R. McEwen, Y. M. C. A. Secretary. The St. Thomas Times-Journal has provided us with a list of over 100 places offering accommodation to Airmen. Many have found satisfactory quarters with a minimum of trouble through the use of our catalogue.

* * * *

That the New York Times of November, 1939, carried this item: “There is an ironic rumor, known for some time to the American industry, that neither Hitler nor Goering will fly in any ship that is not powered by an American engine manufactured by a branch factory in Germany.”

* * * *

That you are invited to join the “Toc H” Club. For details, please contact Corporal Baker, No. 2 Squadron, 2 Wing.

* * * *

That the R. C. A. F. Camera Club meets every Wednesday night at 1830 hours next door to No. 1 Wing Orderly Room.

* * * *

That your uniform gives you full membership privileges in any Y. M. C. A. in Canada.

“PLANE FACTS”

By L. A. C. Harland, M.W.

Experienced skywriters like to work at 15,000 feet. The best size for letters at that elevation is between one half mile and one mile high. They write in reverse as a sign writer letters inside a window.

* * * *

Captain Udet, German world war ace and intrepid Hollywood stunt flyer, well known on this side of the ocean and quite Americanized, is back in Germany in charge of the German parachute invading division. He was once marooned on a small tropical island and rescued, not without difficulty, by R.A.F. airmen.

* * * *

Captain Eddie Rickenbacker, America's world war ace, started out as a groundman. Quitting his post as General Pershing's chauffeur in France, he got in the air corps as mechanic. They could not keep him on the ground. Starting flying without permission, he became the United States' leading air fighter.

* * * *

According to the British Air Ministry official statement, during the three months from August 1st to November 1st, Germany lost approximately 2,500 aircraft in combat, which amounts to nearly 30 per day. In one week they lost 472. It is claimed that Britain lost only 800 aircraft during this same period.

* * * *

Malton airport personnel have adopted a duck for mascot. The duck is just one of the boys, goes to parties and likes an occasional drink.

* * * *

Mayor F. H. LaGuardia, mayor of New York City and American head of the United States-Canada joint defense commission, was a major in the U. S. Air Corps in the last war and saw active service in France.

Turkey has a number of reserve squadrons manned by women pilots, many of whom have seen active service in tribal skirmishes, and have actually dropped bombs on enemy objectives.

* * * *

The Governments of England and the United States are soon to cease giving any figures on aircraft production, according to reports. H. W. Kaltenborn, radio commentator, estimates that at present some 400 planes per month are being sent from the United States to Britain, which number very soon will be increased to 700.

* * * *

Dr. Julius Comroe recently told the National Academy of Sciences in Philadelphia that loss of consciousness, quite often attributed to other causes such as rapid pullouts from dives, might well be caused by too rapid inhalation of auxiliary oxygen at high altitudes.

* * * *

A new innovation in aircraft production is the use of interchangeable metal parts designed to fit various standard makes of aircraft and expected to aid in greatly increasing production.

* * * *

German and Italian bombers, if and when the occasion arises, will have to hunt for Turkish industrial plants. They are well scattered in Turkey's interior.

* * * *

Even the warriors of the ancient empires knew the value of flying in warfare. As far back as 300 B.C. carrier pigeons were used to carry dispatches. It is not improbable that visionary Greeks and Romans imagined warfare as it is conducted today.

* * * *

American regular army pilots stick to their own planes and their own ground crew chiefs as far as this is practical. Usually the pilot's name is lettered on the left side of the plane and the sergeant crew chief's name on the right.

EDITOR'S NOTE: This Feature appeared last month under heading "Do You Know"



TECHNICAL TOPICS

DEVELOPMENT OF A MODERN LIQUID-COOLED AERO ENGINE

* * *

(1) Forty years ago, in the U.S.A., an aeroplane engine was designed and built, that developed $2\frac{1}{2}$ H.P., for a weight of 120 lbs. This engine was of the radial water-cooled type, and, as we can understand now, was not altogether a complete success. Nearly ten years elapsed before any "V" type water-cooled engine appeared, and when it was presented to the world was an eight-cylinder "V" engine designed by Glenn Curtiss, an American. This was but the prelude to far greater achievements in the "V" type aero engine movement, Mr. Curtiss possibly taking advantage of his lead and, being well to the fore in the layout and construction of this type, retained his position for a long period in the world's liquid-cooled aero engine design and manufacture.

Pressure of war conditions (1914-1918) quickly brought out the Rolls-Royce "Eagle" and "Falcon" engine, and later the "Liberty" engine, the last named being designed and manufactured in U.S.A. as the result of amalgamating into one engine the better and more advanced ideas of the then existant "V" engines. We had here an aero engine developing 400 H.P. for just 844 lbs. weight, dry. This, then, must be considered as one of the forerunners of modern liquid-cooled "V" engines. Later came the Napier "Lion" class of liquid-cooled engine, it being of the "Broad Arrow" or "W" type, and also the Rolls-Royce "Condor" engine, both of which appeared about the end of World War No. 1. Then followed the comparatively well-known series of Rolls-Royce engines—"Buzzard," "Kestrel," and "Goshawk" types. The performances of these engines will be dealt with later.

Just as World War No. 1 accelerated engine design and development from 1914 to 1918, so the increasing demand for more powerful motors, with yet less weight per H.P., coupled with greater efficiency and reliability, has led to the appearance of one of the most powerful liquid-cooled aero engines of the "V" type that the world has ever known—the Rolls-Royce "Merlin," which for a weight of 1,335 lbs., dry, develops 1,030 H.P. at 16,250 feet.

During this time we must not imagine that the designers of air-cooled aero engines were

standing still—far from it! From the original "Gnome" rotary engine of 1909 with five cylinders and a power output of 34 H.P. for $134\frac{1}{2}$ lbs. weight to the modern Wright "Cyclone" of fourteen cylinders and 1,200 H.P. for a weight of 1,875 lbs. is an achievement to be proud of indeed.

As was only natural, a certain competitive spirit or rivalry sprang up between the adherents to the liquid-cooled, and the air-cooled class, and exists to this day, and although there are those who still hotly contest the advantages of the one type over the other, it is not our intention or desire, to enter the field with them, here. However, it must be remembered that operational conditions have to be taken into consideration when comparing these two types, for this will undoubtedly influence to a marked degree the final decision as to which type is the better, for a given job of work, under given climatic and geographical conditions.

Since then we are not about to discuss air-cooled engines in this article, let us leave it at that, and devote our attention to the liquid-cooled class.

(2) Let us turn to the early engines, discover their shortcomings, and find out how these were overcome. First the "Liberty" with a power output of 400 H.P. for 844 lbs. weight, dry, gives us a power/weight ratio of just over $\frac{1}{2}$. This was an excellent engine, giving yeoman service in the later phases of the last war, but it undoubtedly had its defects. For instance, we find that it was of the "direct-drive" type *i.e.*, the airscrew was fastened directly to the crankshaft, imposing on that overworked component stresses which in many cases ultimately caused failure of the shaft. The cylinders were of the separate type, being made from steel forgings, with a steel water jacket welded to the outside, each jacket being connected to its water inlet and outlet pipe, separately, by rubber hose. Naturally, water leaks were prevalent, giving considerable trouble. The welded water jackets gave trouble, due to fatigue, cracks occurring in or around the welded joint. The connecting rods were of the forked type, with big end bearings of bronze, and white-metal linings. The plain rod had its bearing surface on the outer periphery of the forked rod bearing; that is, directly on to the bronze back of the bearing shell. Main bearings were bronze shells with white-metal

linings. These types of bearing gave some trouble, but not to the extent that was encountered later, when power output was increased.

Close examination of scavenge oil filters was necessary to ensure that the white-metal bearings had not failed.

Ignition was of the Delco battery type, consisting of a low voltage generator, a storage battery, with distributors at the driving end of the camshaft housing, very similar to present-day car practice. All these items gave trouble at one time or another. Fire hazard was always present, and acid in the battery was often spilled, to the detriment of the aircraft, during aerobatics. The generator drive shaft, being rather spinkly, often failed in flight, giving the aircraft the endurance of the battery only, while the distributor heads, of the carbon track type, were a common source of trouble. The period between overhauls varied between 100-110 hours which was, at that time, considered good.

The Napier "Lion," when it made its bow to aviation, was a distinct improvement. With a power output of 450 and a weight of 858 lbs., dry, it was an improvement in H.P. ratio. Yet this type had many defects, which were soon forthcoming, when the engine was put into service. Some of the troubles experienced on the "Liberty" were overcome in this type, although new ones were discovered.

This engine employed a reduction gear and separate airscrew shaft, thus relieving the crankshaft of some of the load of the airscrew. But this meant an alteration in crankcase design, and it was discovered that the crankcase was subject to cracks in the vicinity of the reduction gear housing, brought about, as was generally accepted, by additional loading at this point. This was eventually overcome by the introduction of stiffening webs.

The cylinders of the separate steel type with pressed steel jackets and welded seams, still retained the inherent disadvantages of this type, that of water leaks. Some idea of the magnitude of these leaks may be gained if we realize that an authorized repair scheme was introduced, permitting, within limits, leaks to be corrected by soldering patches to the outside of the jackets. Rubber hose joints were still used, which, being rubber, were subject to rapid deterioration. The attachment of the head to the cylinder was effected through the medium of the four screwed valve seats. Compression leaks at this point were common, usually entailing complete cylinder replacement. Later type cylinders were reinforced by strips soldered over the welded jacket joints, in an attempt to solve the water leak problem. Further experience proved that internal cor-

rosion was mainly responsible for these leaks.

A peculiarity on this engine was the adoption of roller races for main bearings, which was made possible by the decrease in overall length, and "arrow" formation cylinder blocks. Considerable trouble was experienced from this source, due to outer race "tracking," eventually being partly overcome by the fitting of transverse main bearing bolts. Our memory goes back to the high degree of skill necessary for the assembly of these roller races to the crankshaft, and ultimate fitting into the crankcase. Again, this engine saw the introduction of the spring loaded spanner to ensure correct tightness of big end bearing caps. White-metal bearing failure led to the introduction of lead-bronze bearings for this engine.

Carburation and fuel mixture distribution was a problem with this type, leading to considerable experiment on repositioning of carburetor intakes, and introducing mixture control pressure balance ducts.

Magneto ignition was incorporated on this engine and found to be reasonably trouble-free.

In view of the foregoing, it will be appreciated that an aircraft leaving for a long flight, or for a protracted stay at another, possibly remote, aerodrome, was not without its complement of engine spares, stowed inside the cockpit, as the life of engine parts was varied and uncertain. We had not then reached the high standard of perfection in both design and research that is apparent today.

(3) The Rolls-Royce Company have been producing "V" liquid-cooled engines for many years. The "Eagle" series was introduced toward the end of 1914, while the "Falcon" type followed it later. The last of the "Eagle" series developed 360 H.P. for 926 lb. weight, dry, while the "Falcon 111" had 190 H.P. for around 700 lb. weight, dry. These engines had their individual troubles, the major of which were coolant jacket faults. One of the "Eagle" series had a corrugated water jacket welded to the cylinder in order to try to obviate water jacket trouble, but we have no record of it proving a success. Epicyclic reduction gears were incorporated for the first time in these Rolls-Royce motors, but they were discontinued in later types in favor of the spur reduction gearing.

We still had no efficient substitute for rubber hose, consequently we had frequent hose failure.

On both of these engines a single main connecting rod was employed, utilizing an auxiliary rod anchored to the main rod by a wrist pin. White-metal big end bearings, with their attendant faults, were employed.

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Next to appear was the "Condor" engine; 650 H.P. for 1,350 lbs. weight, dry, which was much like the "Falcon." Originally fitted with an epicyclic reduction gear, the later series of this engine used spur layshaft gearing, employing the self-aligning drive now common to all Rolls-Royce engines.

The cylinders were less prone to water leaks than the earlier engines, although rubber hose was still widely used. Forked connecting rods appeared again with white-metal linings, and the main bearings were of the steel shell, white-metal lined type.

Transverse bolts were employed again here on the main bearing caps to strengthen the cap and crankcase, as it was found that the increased power output necessitated a sturdier support for the main bearings than could be adequately supplied by the two vertical studs. Later type "Condor" engines were supercharged.

Then followed an engine incorporating many new features and closely resembling the Curtiss D.12, the Rolls-Royce FX; originally a "direct drive" engine, with cylinders on the monoblock system. This immediately removed the seat of the water jacket trouble and obviated to a large extent the use of rubber hose for inter-cylinder connections. This system had troubles of its own, as will be seen later. The block was an aluminum alloy casting, with six steel sleeves pressed into it, forming a water jacket between the sleeve and casting. A water and gas-tight joint was formed at the top of the sleeve by an aluminum ring, and a water joint at the base of the sleeve by a rubber ring. Perfection in fitting these sleeves was imperative in the first instance, with periodic inspection and tightening of the block holding down nuts, for tightness was essential if we were to maintain the sleeve joints, upper and lower.

Forked rods, with white-metal lined big ends and white-metal main bearings were employed, with transverse bolts.

The carburetor was placed in the "V" between the blocks. This type developed 490 H.P. for a weight of 760 lbs., dry, and eventually was manufactured with a spur type reduction gear, and with further minor alterations became the basis for the "Kestrel" series. The first of this type experienced the ever-present white-metal big end trouble, which led to their replacement by lead-bronze-alloy bearings.

Later "Kestrels" (IV, V and VI) developed 600 H.P. for 955 lb. weight, dry, while the VII, VIII and IX types developed 675 H.P. for 955 lb. weight. It is a feature to be noted here that as the power output of these engines increased, the crankshaft speed increased, and the ratio

of airscrew to crankshaft speed became smaller. These 6 "Kestrel" types were supercharged to a greater or less degree, and brought their own defects with them, one being the tendency to "blow" joints made in the induction system. This was overcome by the introduction of better jointing material and adherence to periodic check of parts known to be liable to become "free" or loose in flight.

"Kestrels" XIV, XV and XVI models gave 715 H.P. for 985 lb. weight, dry, and the "Buzzard" was almost identical with the "F" type engine but had a power rating of 825 H.P. for 1,460 lbs. dry. This engine was also supercharged as was the Rolls-Royce "R" racing engine developing 1,900 H.P. with a weight of 1,630 lbs. dry. These latter engines were designed solely for racing purposes.

The Rolls-Royce "Merlin" was announced in 1935 and follows the design of the later "Kestrels" in many ways. It was, however, far more powerful, the series I being of 990 H.P. for 1,340 lbs. dry, and the series II and III of 990/1,030 for no increase in weight. The series I had a detachable cylinder head, however, while the II and III reverted to the "Kestrel" cylinder block design. These engines are fully supercharged with a rated altitude of 12,000 feet, operating with high octane fuel, thereby bringing their own troubles with them, necessitating special anti-corrosive treatment for certain components, to counteract the effect of this "leaded" fuel. A more detailed description of the "Merlin" follows.

(4) Rolls-Royce "Merlin."

Ethylene glycol is used as a cooling medium and a reduction gear ratio of less than $\frac{1}{2}$ to 1 is employed. A two-position pitch or constant speed airscrew may be used, employing engine oil at high pressure as the operative medium. The supercharger is driven at approximately $8\frac{1}{2}$ times crankshaft speed, to give a positive induction pipe pressure, this pressure being regulated automatically.

A twin carburetor is provided, having controlled jets, giving automatic mixture adjustment for varying altitudes and boost pressures.

Two six-cylinder monoblocks are used, each cylinder having two intake and two exhaust valves, operated by an overhead camshaft, driven from the rear of the engine.

Steel sleeves form the cylinder bores, the upper joint being made by an aluminium ring, and the lower by a spring loaded rubber ring. The block is secured to the crankcase by long studs passing through guard tubes inserted in the blocks. These latter form a connection between the camshaft assembly and the crankcase, for lubrication purposes.

The crankshaft is of the usual six-throw type, is counterbalanced, and is carried in seven lead-bronze bearings.

A spring drive, consisting of a flexible spring steel shaft, is engaged at the rear end to drive the auxiliaries.

Connecting rods are of the forked marine type with lead-bronze bearing surfaces. Full floating gudgeon pins and small end bushes are provided.

Two fully synchronized magnetos are fitted, one firing the exhaust and the other the intake plugs, the high tension cables being carried in suitable metal conduits.

A centrifugal coolant pump and fuel pressure pump of the gear type are employed. Drives are also provided for aircraft and engine, accessories which include electric generator, engine speed indicator, hydraulic pump, air compressor and a generator pump for the hydraulic service.

Lubrication is on the dry pump system, having one pressure and two scavenge pumps, all pumps being of the high capacity gear type.

It will be obvious that the modern aero engine of the liquid-cooled type will be prone to many defects. Many of these may be discounted by attention to the particular engine, and rigid adherence to maintenance orders, by the mechanic. Also by attention to the by no means less essential things as care of tools, scrupulous cleanliness, etc.

To particularize, coolant leaks may be prevented by careful and proper attention to cylinder holding down nuts, ensuring that they are not strained on tightening; by correct tightening and locking of the "Gland" type coolant pipe joints, remembering that in many cases overtightening of the gland will *cause* a leak; keeping coolant pump spindle correctly, but not over-greased, and the gland nut tightened correctly; and by maintaining all gasket joints in a sound condition and the nuts tight.

Oil leaks may be prevented by a system of checking on the tightness of *all* nuts, and the good condition of any leather, fibre or rubber washers fitted. Pipes and leads may be guarded by adequate support and protection against vibration.

Carburetor trouble may be avoided by correct maintenance of jointing materials, correct lubrication of moving parts, periodic check of moving parts and linkwork, renewing the part as soon as wear is seen to be taking place, the avoidance of running the engine in sandy or dusty surroundings, and attention to the tightness of spark plugs, etc.

Bearing trouble may be avoided by strict

adherence to times for oil change and scrupulous inspection of scavenge oil filters periodically. Clean these latter in a convenient, clean receptacle, with a suitable solvent, avoiding the use of rag for drying off.

Close attention must be paid to periodic check of valve tappet clearance. Abnormal variation should be closely investigated. Inattention to this point will in time affect the mixture to the extent that a failure is likely to take place.

A check on the compression of each cylinder is advised, periodically, as this will indicate faulty or badly seating valves, which demands immediate attention and investigation.

Ignition trouble can be almost eliminated by the utmost care in attention to magneto contact points, cleanliness of all electrical contacts and spark plug points, and a rigid test of all spark plugs, rejecting any that might appear doubtful, extreme care must be exercised when cleaning spark plug points and resetting the gaps. It is essential that strict attention be paid to existing orders relative to reconditioning of the platinum electrode spark plug.

At regular intervals, the specific gravity of the coolant should be checked in order to ensure conformity with maker's specifications. Overheating may result if the specific gravity falls too low.

It will be found that absolute cleanliness will be a first rate help in guiding the mechanic to the seat of any impending trouble, as a clean engine will often give tell-tale marks of an approaching fault, where a dusty engine is apt to mislead or cover.

Care of tools, always an important point, becomes almost vital in an aeroplane engine maintenance. The general use of adjustable jaw wrenches should be avoided wherever possible.

(6) The life of the engine will be prolonged if the following points are observed:

1. Overpriming of engine before starting. This may cause lubricant to be washed from cylinder walls and permit engine to "run dry" momentarily on eventual starting.
2. Avoid long periods of idling, otherwise spark plug points may become fouled.
3. Do not "open up" engine until the oil inlet temperature is at the minimum temperature laid down in maker's or Air Force orders.
4. Avoidance of long periods of ground running, especially at large throttle openings.
5. Sparing use of mixture control, when running engine on ground.

PROGRESS IN POWER/WEIGHT RATIOS
FOR SERVICE TYPES

Engine	Type	Date	H.P.	LBS. WEIGHT DRY	W/P Ratio	Remarks
U.S. Army Type	5-Cyl. Radial	1900	21½	120	5½/1 approx.	Water-Cooled
Curtiss	V-8	1909	50	250	5/1	Water-Cooled
Gnome	5-Cyl. Radial	1909	34	134½	4/1	Air-Cooled
R. R. Eagle	V-12	1914	360	965	2½/1	Water-Cooled
R. R. Falcon 111	V-12	1915	190	715	3.5/1	Water-Cooled
Liberty	V-12	1917	400	844	2.1/1	Water-Cooled
Napier Lion	W-12	1918	450	858	1.9/1	Water-Cooled
R. R. Condon	V-12	1922	650	1310	2/1	Water-Cooled
R. R. FX	V-12	1926	490	760	1.57/1	Water-Cooled Direct Drive
R. R. Kestrel 1B	V-12	1926	480	865	1.8/1	Water-Cooled
Napier Racing	W-12	1927	950	1000	1/1	Water-Cooled Special Racing S/C.
R. R. Buzzard	V-12	1928	825	1460	1.8/1	Water-Cooled S/C.
R. R. R(1)	V-12	1929	1900	1530	.8/1	Water-Cooled Special Racing S/C.
R. R. Kestrel IV, V, VI	V-12	1930	600	955	1.6/1	Water-Cooled S/C.
R. R. R(2)	V-12	1931	2300	1630	.708/1	Water-Cooled Special Racing S/C.
R. R. Kestrel VII, VIII, IX	V-12	1932	675	955	1.3/1	Water-Cooled S/C
Kestrel XIV, XV, XVI	V-12	1932	715	985	1.25/1	Water-Cooled S/C
R. R. Merlin I	V-12	1935	990	1340	1.35/1	Ethylene Glycol Cooled S/C.
R. R. Merlin II, III	V-12	1936	1030	1355	1.3/1	Ethylene Glycol Cooled S/C.
Wright Cyclone	14-Cyl. Radial	1937	1200	1875	1.5/1	Air-Cooled S/C.

