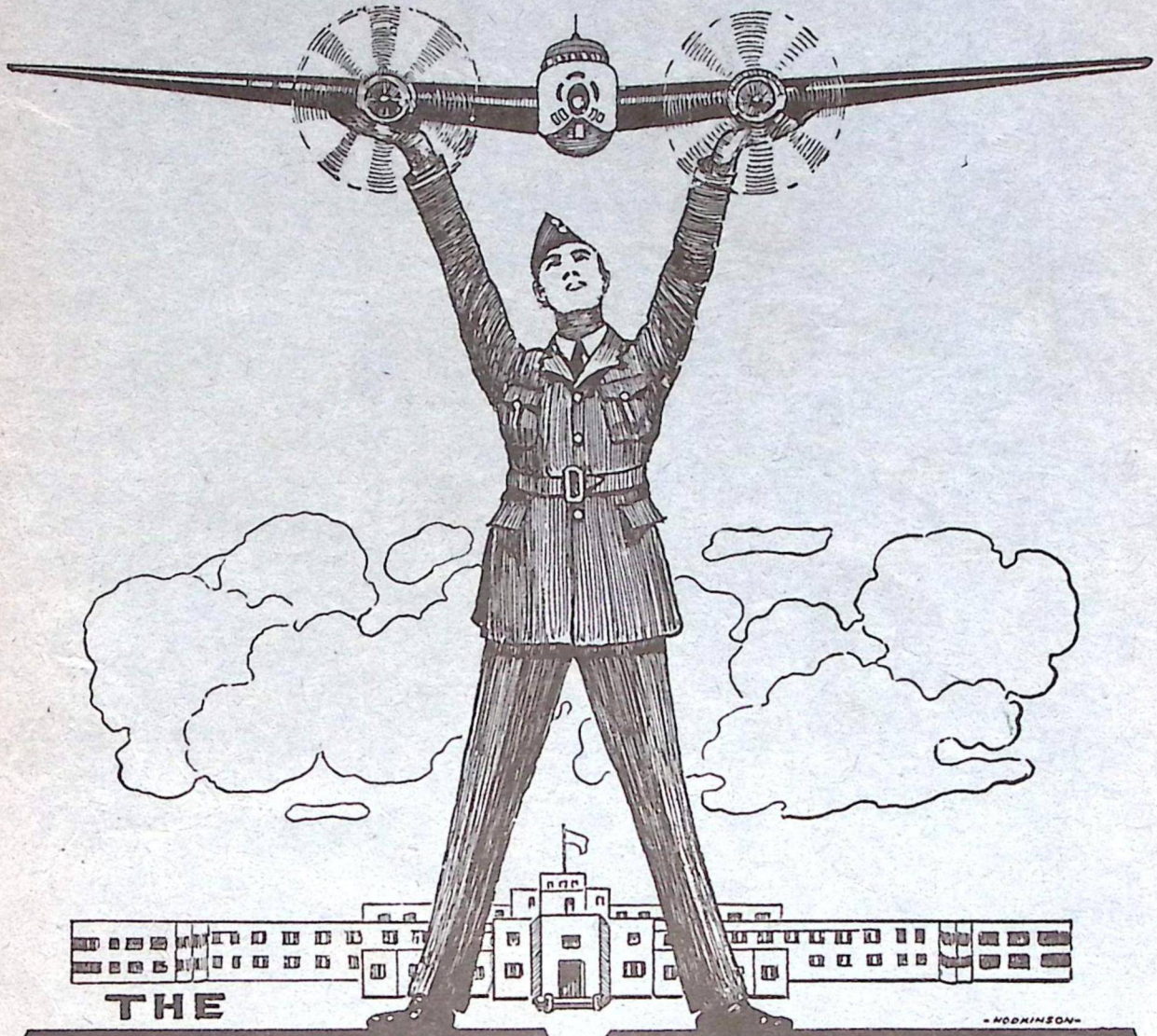


# THE *Aircraftman*

VOL. 2 - NO. 9

APRIL 1942



THE  
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\* \* \*

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Sqn. Ldr. C. S. Wilson (P.M.C.)  
Sqn. Ldr. A. G. Vince  
Flt. Lt. W. L. Marshall (Secretary)  
F.O. W. H. Pooler

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W.O.2 W. Ard (President)  
Flt. Sgt. Barnard (Secretary-Treasurer)  
Two Members

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Cpl. Campbell (Chairman)  
Cpl. Weaver (President)  
Cpl. Sawyer (Secretary-Treasurer)  
Two Members

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F.O. W. H. Pooler (Secretary)  
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F.O. E. Hendry, 2 Wing  
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2 Wing Headquarters Squadron

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Flt. Lt. W. Surman  
Flt. Lt. H. Courtemanche  
Flt. Lt. W. Van Gorder  
R. C. Good, Y.M.C.A. (Secretary)  
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O.C. No. 2 Wing  
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Sqn. Ldr. A. G. Vince (Secretary)  
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F.O. G. H. Ross, No. 1 Squadron, 1 Wing  
F.O. A. R. Little, No. 2 Squadron, 1 Wing  
F.O. J. M. Harris, No. 3 Squadron, 1 Wing  
F.O. J. E. Boyes, No. 1 Squadron, 2 Wing  
Flt. Lt. J. Drummond, No. 2 Squadron, 2 Wing  
F.O. D. G. Kerr, No. 3 Squadron, 2 Wing  
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Cpl. Schellenburg  
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Cpl. Mead

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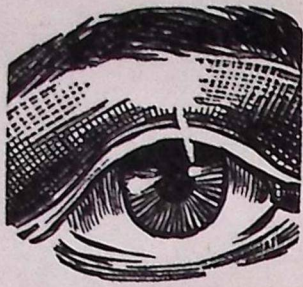
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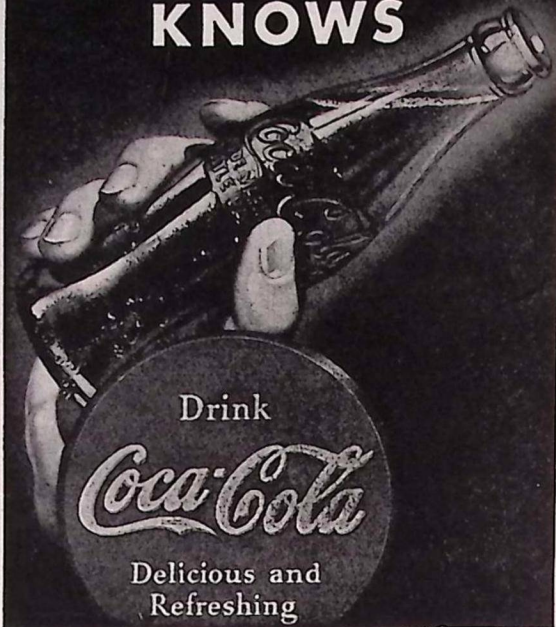
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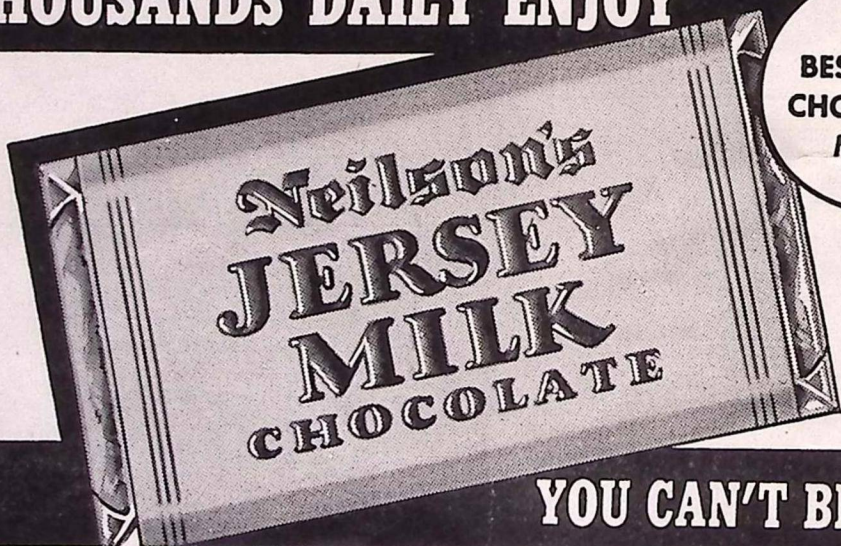
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# THE AIRCRAFTMAN

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

VOL. 2 - APRIL 1942 - NO. 9



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Editors - Flt. Lt. W. Surman (Prot. Padre) - Flt. Lt. M. C. Davies (Prot. Padre)  
Flt. Lt. H. F. D. Smeaton (R. C. Padre)  
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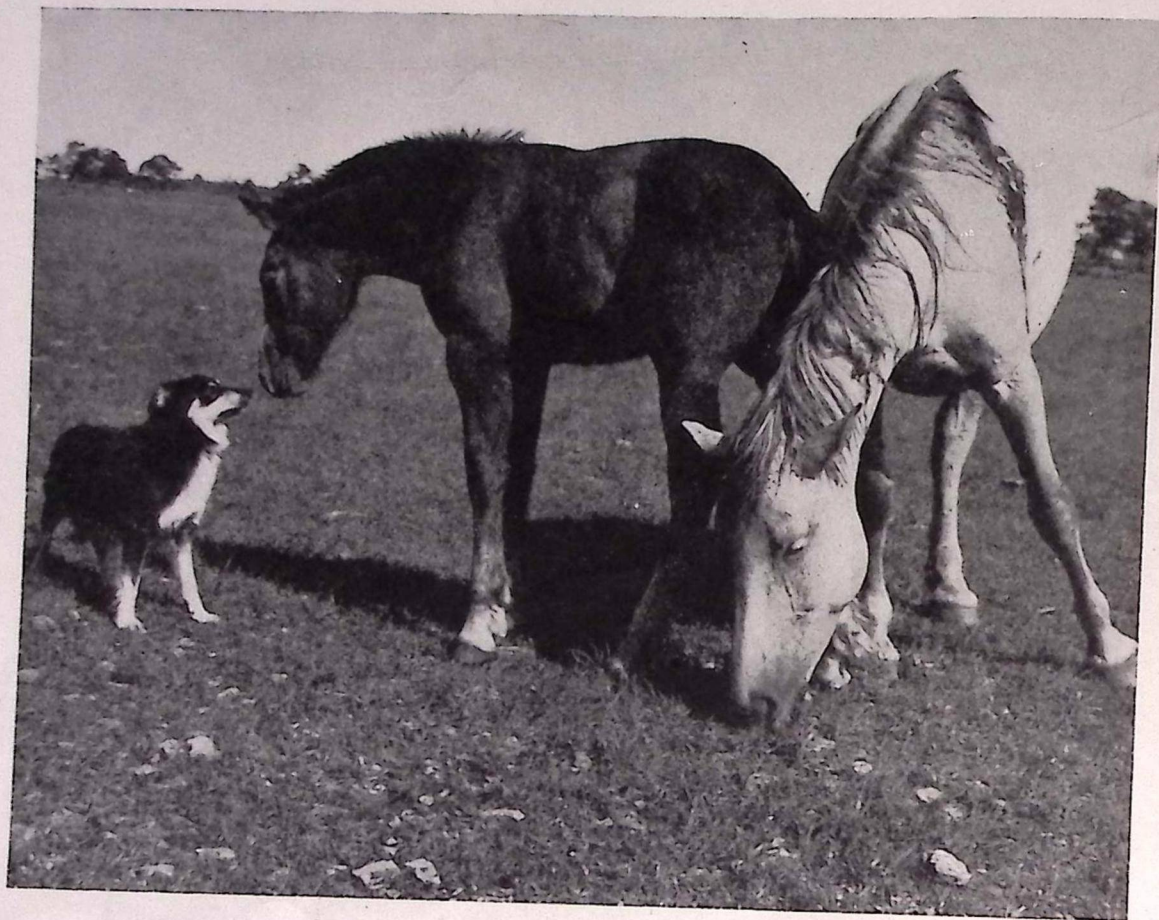
## FRIENDSHIP



*Gold cannot buy it,  
Poverty try it;  
Thirst may not cheapen it,  
Sorrow must deepen it;  
Joy cannot lose it,  
Malice abuse it;  
Wit cannot choke it,*

*Folly provoke it;  
Age can but strengthen it,  
Time only lengthen it;  
Death cannot sever  
Friendship forever.  
Heaven the true place of it;  
God is the grace of it.*

The Picture of The Month



*Well?*

*Cpl. Houlgrave, G. P.*



« « EDITORIALS » »

**STICKING YOUR NECK OUT**

Nature is wonderful! So what? We all know that, why bother to take time to write it? Well, we are thinking of turtles. Again, so what? Well, turtles are pretty wonderful creatures. They have for centuries been ahead of humans. They have, for instance, lived in shelters like our bomb-proof structures. While they remain incased in their shell they are well protected, but once they stick their neck out from under the shell they become vulnerable—for that neck is pretty soft and the head fairly large and it makes a good target.

However, there are times when it is necessary for the turtle to stick his neck out for unless he does he cannot go any place. He must remain static while his neck is drawn back under his shell. So with us humans. Unless, from time to time, we take a look around to see where we are, we shall just remain in one spot.

The phrase "sticking your neck out" likely came into our "slanguage" to illustrate an action taken deliberately when one knew that unpleasant consequences might follow. It was meant to be a warning. Now, however, the phrase has become quite generally known throughout the service (and indeed among the civilian population) and it has rather a bad odour. It has now taken to itself the meaning "Be careful to do only that which you must. Don't be a sucker. Do as little as you can and let someone else do the work. Take no responsibility so that you will never receive any censure if the thing goes wrong."

Every day we live we find ourselves in situations which demand from us decision and action. It is generally possible for us to look at these situations, shrug our shoulders and pass them by. The result, of course, is that we leave the world no better because we passed along the way, and we have done ourselves harm because we have once more confirmed ourselves in a lethargic and lazy manner of life. Each time we do this we strengthen the habit and it finally gets to be a part of our make-up.

"Sticking your neck out" in the sense of being foolhardy is to be deplored, but to label the assuming of responsibility, or the spirit of co-operation or service as "sticking your neck out" is just a mask to cover our own weakness, indifference and ineffectiveness.

On this Station there are a multitude of things to be done *by us*. These things are our opportunity. We may grasp them or pass them by. If we do the former we strengthen our Station or ourselves; if we pass them by we weaken both.

Most of the advances the world has seen have been made by men and women who were willing to dare, sacrifice or work a bit. The world calls it "sticking your neck out." Those who think and discriminate have a much finer name for it. If each of us refused to do his job, how soon we should find the world going backwards instead of progressing. Somewhere recently we read this sentence "So act that your conduct is worthy of becoming a principle of universal law." What does it mean? Just this: act in such a way that if every member of your family acted in the same way your home would be the best home on earth. Act in such a way that if every member of your school acted the same way yours would be the best possible school—or station—or church—or finally, the world. Act so that if everyone else acted the same way the world would be better and not worse. That is not "sticking your neck out." That is the way to build the world for which we fight—but the fight must begin *inside* each one of us.

\* \* \*

**OUR GIRLS**

We think it is time to hand out an orchid. This time the bloom goes to our own T.T.S. Girls. They are a pretty grand group of "gals" and anyone who says differently takes an awful risk. However, we desire to be more specific and outline, for the benefit of the general personnel on the Station, one of their many good works. It may not be generally understood that the T.T.S. Girls sponsor the regular Friday night dances at the Y.W.C.A. in St. Thomas. These dances are for the Airmen on this Station and have proved to be extremely popular. A small charge (25c) is made to cover expenses. This includes lunch and a partner. The object behind the plan is to give the Airmen a good time at a minimum of cost. In spite of this, a small surplus accumulates from time to time and it has been used to good advantage. The girls have had made (and paid for) a public address system. This cuts out the expense involved in the rental of a music box or in hiring an orchestra.

The best of the new records are used from week to week. At Christmas a large supply of cigarettes was sent to R.C.A.F. personnel overseas. These came out of profits. Perhaps the greatest contribution is made in the repair of radios for the Hospital. Our Station Hospital has a number of small radios which are everlastingly getting out of repair and having the cases smashed. In co-operation with the Y.M.C.A., the girls supply funds to keep these repaired. It is a great service and is much appreciated. Our girls are just about tops and we want the world to know it.

\* \* \*

R. C. A. F.

PUBLIC RELATIONS—RELEASE No. 510

"Canada" badges worn on the shoulders of members of the Royal Canadian Air Force will remain solely the distinguishing mark of personnel who have served in an active theatre of war or those who are under orders for overseas service, Royal Canadian Air Force Headquarters announced.

The unconditional nature of enlistment in the R.C.A.F. eliminates any necessity—as in the case of the army—of distinguishing between those who have volunteered for service overseas and those who are engaged in service in Canada alone. All members of the R.C.A.F. have volunteered to serve the King anywhere in the world and the special shoulder badges become necessary only to identify Canadians serving along with other Empire forces in some theatre of action.

Recently the Army decided to provide "Canada" badges for all personnel volunteering for overseas service to distinguish them from those engaged solely in home defence. The possibility of following this practice was investigated at Air Force Headquarters but it was decided to leave unchanged the order which restricts the wearing of the badges to those who are on, have been on, or are proceeding to, duty overseas or in Newfoundland. Such personnel, of course, are permitted to continue wearing these badges after return to the Dominion.

\* \* \*

An Italian Captain having been sent for reinforcements arrived back at the front lines and reported to his Italian Generalissimo straw boss.

"Well, where are they?" the Generalissimo scare-crow inquired impatiently.

"They're about five miles back, monsignor. They are held up. There are a couple of drunken Australians that won't let them come through."

THE RUMOR

Absolute knowledge I have none,  
But my aunt's washerwoman's sister's son  
Heard a policeman on his beat  
Say to a laborer on the street  
That he had a letter just last week  
Written in the finest Greek  
By a Chinese coolie in Timbuctoo,  
Who said the negroes in Cuba knew  
Of a colored man in a Texas town  
Who got it straight from a circus clown  
That a man in Klondike heard the news  
From a gang of South American Jews  
Of somebody in Borneo  
Who knew a man who claimed to know  
A swell society female fake  
Whose mother-in-law would undertake  
To prove that her husband's sister's niece  
Had stated in a printed piece  
That she had a cousin who had a friend  
Who knew when the war was going to end!

\* \* \*

**S**O LONG as the English tongue survives, the word Dunkirk will be spoken with reverence. For in that harbor, in such a hell as never blazed on earth before, at the end of a lost battle, the rags and blemishes that have hidden the soul of democracy fell away. There, beaten but unconquered, in shining splendor, she faced the enemy.

"They sent away the wounded first. Men died so that others could escape. It was not so simple a thing as courage, which the Nazis had in plenty. It was not so simple a thing as discipline, which can be hammered into men by a drill sergeant. It was not the result of careful planning, for there could have been little. It was the common man of the free countries, rising in all his glory out of mill, office, factory, mine, farm and ship, applying to war the lessons learned when he went down the shaft to bring out trapped comrades, when he hurled the lifeboat through the surf, when he endured poverty and hard work for his children's sake.

"This shining thing in the souls of free men Hitler cannot command, or attain, or conquer. He has crushed it, where he could, from German hearts. It is the great tradition of democracy. It is the future. It is victory."

—THE NEW YORK TIMES.

# « « SPORTS » »

## COMMANDING OFFICER'S TROPHY

Heartiest congratulations to No. 1 Squadron of No. 2 Wing on winning the Commanding Officer's Trophy in February. The series ran into March so it was impossible to get the results in the last issue of THE AIRCRAFTMAN. No. 1 Squadron, 2 Wing won volleyball (again), making it five straight months. Now that Cpl's Harwood and Grant have retired and Brownell and Edwards have been posted, it will take time to whip the team into shape again, but they are doing fairly well. The same Squadron won badminton for the first time in many starts. They were nosed out of basketball by only one game. However, that gives a little variety to things and gave Headquarters a chance to get a share of the medals. Headquarters finished in second place and No. 1 Squadron, 1 Wing third. Do you remember, they won way back in January? They are out in front at this time of writing and stand a good chance of repeating, but No. 1 Squadron, 2 Wing are not going to take it lying down. It will be interesting to see what happens. Hope we can tell you all about it in this issue.

\* \* \*

Considerable keenness was displayed during the entire month for this Trophy and it was necessary to have a full number of games played in order to decide a winner.

The first quarter of the new year the Trophy has changed hands between F.O. Boyes' Squadron and F.O. Ross' Squadron. Each month a small margin has decided the winner and the writer congratulates the efforts of F.O. Ross for winning the Trophy during the month of March and the keen interest Flt. Sgt. Maybie has shown by his attendance at all games in the Drill Hall. F.O. Boyes has displayed equal enthusiasm for his Squadron and his able assistant, Sgt. Goodmanson, for keeping the Squadron well in the running. It will be interesting to see who is the final victor in the indoor season, which ends during the month of April. Weather permitting, the outdoor season will open the first of May. Congratulations to all Squadron O.C.'s for their splendid interest during March, and may a dark horse overtake F.O. Ross or F.O. Boyes.

\* \* \*

Is our face red? Are we embarrassed? In fact, we are ashamed of ourselves. In the rush

of getting THE AIRCRAFTMAN off the press on time (we are not bragging but we actually did) we overlooked the fact that we had not congratulated No. 1 Squadron of No. 1 Wing on winning the Commanding Officer's Trophy for the month of January. When this was brought to our attention we could not find a knot hole small enough into which we might crawl. However, belated as they are, our congratulations are sincere.

\* \* \*

## AROUND THE SQUARE

*By Slam Bang*

Neither training camp for boxing is giving out any information, but our spies report that both camps are working overtime. A.C. Miller, instructor of No. 1 Wing, has his boys on a special diet and Sgt. MacFarland puts them to bed early, which means they should be in excellent order. Sgt. Canzano is using the "up-and-over" system. Very little is known of this new system, but Sgt. Brown



testifies that this new approach will bring the desired result.

Flt. Lt. W. Blackie, i/c boxing, is rather disappointed at not being able to give an added attraction in the "square circle" by having outside talent. The local visitor restriction is responsible and by the time of the next show the ban will likely be lifted.

The result of the last boxing show has given both Wing instructors an opportunity to review the boxers and pick their team for the final Wing set-to in April. Flt. Lt. Blackie is anxious to develop a Station team that can challenge M.D. No. 1 or other R.C.A.F. Stations in this Command. Everyone is rather anxious for T.T.S. boxers to display their wares in competition with other Stations and we hope Flt. Lt. Blackie can make the necessary arrangements. Last year T.T.S. outclassed M.D. No. 1 boxers very handily and we hope they will repeat the good work this year if the opportunity is presented.

Sgt. May, i/c P. T. I., reports his boys are taking P. T. classes themselves to keep them in shape to handle the extra duties the night of the boxing tournaments.

# STATION ACTIVITIES

## HONOR STUDENT MEDALS



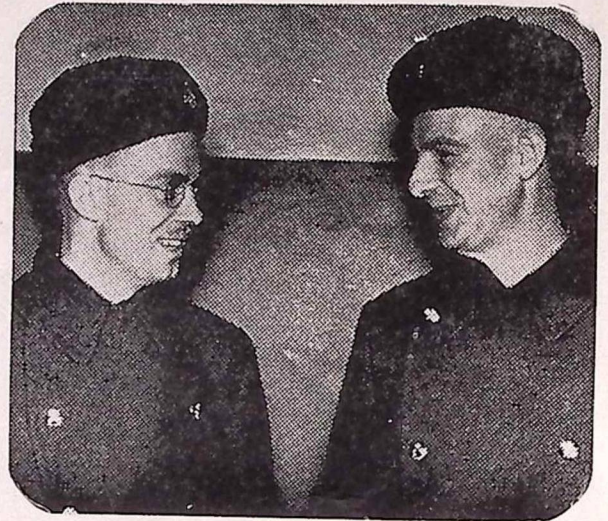
A.C.2 Martyn, W. M.	R152087
A.C.2 Purchase, L. G.	R152064
A.C.2 Hill, W. F.	R152036
Ft. Sgt. White, H. V. A.	R72558
Sgt. Hodgson, R. A.	R112871
Cpl. Connor, R. A.	R116960

## BASKETBALL — MARCH

Birrell, P. L.	R122493
Hamson, W. G.	R118486
Winkworth, J. T. A.	R118581
Hincks, H. O.	R118447
Hodgson, W. T.	R118469
Jaynes, W. F.	R118453
Lorimer, J. M.	R118452
Alexander, A. H. A.	R133009
Affleck, L. O.	R118416
Castator, M. E.	R144302

\* \* \*

## Gold Medalists



Two of the three Aircraftmen who headed classes graduated at the R.C.A.F. Technical Training School here on Friday, March 6th, and who received the School's Gold Medals from Wing Commander J. H. Keens, A.F.C., the Commanding Officer. They are, left, A.C.1 Frank Donkin, a former Nokomis, Sask., high school teacher, who headed the class of Air Frame Mechanics in the Metal Repair Division, and A.C.2 W. Harry Gough, of Edmonton, Alta., who was an automotive machinist and who trained as an aero engine mechanic. A third gold medalist, A.C.2 K. A. McFarlane, Chilliwack, B.C., was ill and unable to be on parade. He headed the class of Air Frame Mechanics.

\* \* \*

## DRILL TROPHY

In the second competition for the new Drill Trophy No. 2 Squadron of 1 Wing were the

### Entry

85 A.E.M.	R135393	- *A.C.2 Jospe, J. D.
85 A.F.M.	R121146	- *A.C.2 Goods, F.
80 A.F.M. (MR)	R125365	- *A.C.1 Hargrave, J. W. B.
19 I.M.	R121430	- *A.C.2 Martin, W. J. G.
84 A.E.M.	R113843	- *A.C.2 Glencross, G. J.
84 A.F.M.	R118505	- *A.C.2 McDowell, H. R.
79 A.F.M. (MR)	R126017	- *A.C.1 Landry, P. G.
86 A.E.M.	R121998	- A.C.2 Gough, W. H.
86 A.F.M.	R133033	- A.C.2 Macfarlane, K. A.
81 A.F.M. (MR)	R120720	- A.C.1 Donkin, F.
87 A.E.M.	R120874	- A.C.2 Dahl, M. C.
87 A.E.M.	R126462	- A.C.2 Grondin, J. G. R.
82 A.F.M. (MR)	R118500	- A.C.1 Sanford, A. J. M.
18 Elect.	R122074	- A.C.2 McConnell, W. H.
88 A.E.M.	R145607	- A.C.2 Gould, V. W.
88 A.F.M.	R139854	- A.C.2 Peters, R. M.
83 A.F.M. (MR)	R132054	- A.C.1 MacDonald, A. F.
No. 1 Equipment Assistants' Course (W. D.)—W301485		
A.W.2 MacLeod, H.		
No. 23 Equipment Assistants' Course—R146869 A.C.2		
Broadley, J. E.		

\* For February.

## VOLLEYBALL — MARCH

Saltsman, W. M.	R136231
Argue, F. H. B.	R95995
Harrison, H. H.	R101771
Simmons, D. S.	R135385
Shamovitch, I.	R144822
Kost, F. J.	R136137

## BADMINTON — MARCH

Barber, R. F.	R118420
Cocks, F.	R138425
Hawthorne, T.	R152035
Miller, K.	R142155
Kincaid, R.	R152041

## HOCKEY — MARCH

Cpl. MacDougall, A. M.	R92627
Cpl. Fraser, S. F.	R72395
A.C.2 Weale, R.	R152095
A.C.2 Winarsky, W.	R142047
A.C.2 Hamilton, W. C.	R142380

winners. The Commanding Officer called F.O. A. R. Little to receive the trophy, but F.O. Little, with his usual modesty and charm, asked that Cpl. (now Sgt.) Gordon Gutzell, who drilled the team, be allowed to receive the trophy on behalf of the Squadron. The Commanding Officer graciously allowed this to be done and F.O. Little's action received a big hand from those on parade.

Congratulations to No. 2 Squadron, 1 Wing. We hope you will repeat often but not often enough to make it uninteresting for the other Squadrons. Beware, though, the gals are in this competition now and you will have to look to your laurels, Airmen—or else!

### A WELCOME

If you are married, why not tell your wife about the welcome which awaits her at the weekly meeting of the T.T.S. Women's Auxiliary on Thursday afternoon at 2.00 o'clock in the War Service Room of the St. Thomas Y.W.C.A.? We are sure she will be happy with us, enjoying the friendly spirit that pervades every Auxiliary meeting, and perchance helping in some of the activities of the group. Ours is a free and easy get-together of the wives of Airmen, N.C.O.'s and Officers. Newcomers will receive a special welcome at any time. No one needs to wait for an introduction. We guarantee to make everyone feel at home in the first five minutes. Don't let your wife be lonely; urge her to join the Women's Auxiliary.

\* \* \*

### "LIFEBUOY FOLLIES"



Fast-moving Revues take the place of the concert parties for the troops in this war, as in "The Lifebuoy Follies," the cast of which is shown here: TOP ROW—Jimmy Devon, Sasha Dener, Harold Rich and Pat Rafferty. BOTTOM ROW—Helen Bruce, Mildred Moray, Irene Hughes and Dorothy Merrill. "The Lifebuoy Follies" will be presented at T.T.S. on April. 8th.

# « T.T.S. Air Women's Section »

It is now nearly six weeks since T.T.S. was invaded by the Women's Division. We hope our arrival did not cause too much disturbance, and, now that the novelty has worn off, we hope that you will all accept us as a matter of course. We are here to equip ourselves to take our part as a useful cog in the vast machinery of the R.C.A.F., and we all intend to make full use of the marvellous facilities offered here for learning our trades under ideal conditions.

T.T.S. far exceeds anything we had ever dreamed of as a training school, and we are all enjoying the experience of working on so huge and efficient a Station.

We would like to thank all those who have done so much to make us happy and comfortable here. From the very beginning we sensed an air of welcome and friendship in all those with whom we came in contact. That feeling has grown until we now feel that we are a very definite part of the School and when we are scattered over the Dominion by that dreaded process "Posting" we shall always look back on our stay at T.T.S. as a very happy and useful phase of our Service life.

Our first Hospital Assistants graduated on Friday, March 6th, and we felt very proud when we saw an Airwoman standing with the honor graduates in the centre of the Drill Hall. The lucky winner of the Gold Medal was A.W.2 McGee, who has since been posted to Summerside. She did a splendid job while she was here, not only in her academic work but also in her everyday life in the barracks. She was a cheerful, conscientious member of the group and was always ready to join in whatever activity was afoot. We miss her very much but wish her every success, and shall always remember her as the Airwoman who won the first Gold Medal at T.T.S.

So far only six of this first course have been posted, the others are awaiting their fate with anxiety, but in the meantime we understand they are doing a grand job on the wards and, although we see very little of them, we are glad they are still with us.

The Equipment Assistants seem to have found their place and to be enjoying life over in E. & A.T.S. Good luck to them when they leave us very soon.

The second course of Hospital Assistants is well under way and looking forward to discovering what life at T.T.S. is really like now

that their enforced isolation is over. We have already told them that they can be sure of a warm welcome to the social activities of the Station in which they are allowed to take part.

There is no need to ask the members of the Women's Division if they are "happy in the Service" while they are at St. Thomas. It is quite obvious from their faces, and from the enthusiasm with which they take everything in their stride, even the Drill Contest. Look out! We'll win that trophy yet in spite of rubber heels!

\* \* \*

Hello, hello! This is the Equipment Assistants talking—the feminine penguins of the Air Force, but more particularly the femmes of the E. & A.T.S., St. Thomas.

Bewildered, befuddled and just plain amazed, we arrived here, and now with our training practically completed we look forward to Station work with mingled feelings.

This course has been quite the thing and we have had very little time for anything less important than our studies. Of course we had the odd moments in which to view the surrounding countryside—a week-end pass and Miss Atkinson's route marches were a help—but we certainly did not have much time to do anything else. So often have we been asked: How do you like it at St. Thomas? How do you like the Air Force? In fact, how do you like everything? Now it is our chance to say exactly what we think of the whole situation.

There has been a tremendous change in our outlook on Air Force routine and Airmen since that first hectic week at T.T.S. The questions that were popped at us from every inch of those miles of corridors were not on a par with the quiz program we C.W.A.A.F.S. could have staged. We seethed inwardly but held our tongues. (A job which was really a chore this time.)

But the attitude and behavior of the Airmen in general since then has helped to quench our flames of indignation. Perhaps they have grown accustomed to seeing girls in their hallways. We have undoubtedly been there often enough to know every inch of the way to the Drill Hall ourselves.

Actually we believe that the majority have come to realize what sort of a spot they placed us in. Sideline chatter and catcalls are all very well at times, but when the recipients can't

## THE AIRCRAFTMAN

even answer back it isn't much fun.

Whatever caused the reformation — we appreciate it.

Each one of us girls realizes that her presence here has brought about certain restrictions. How could we help but do so. Many's the time we have walked into the classroom unexpectedly to have someone stop in the middle of a sentence. Even our instructors have to watch their speech. Stag party jokes just aren't permitted in mixed classes (or are they?).

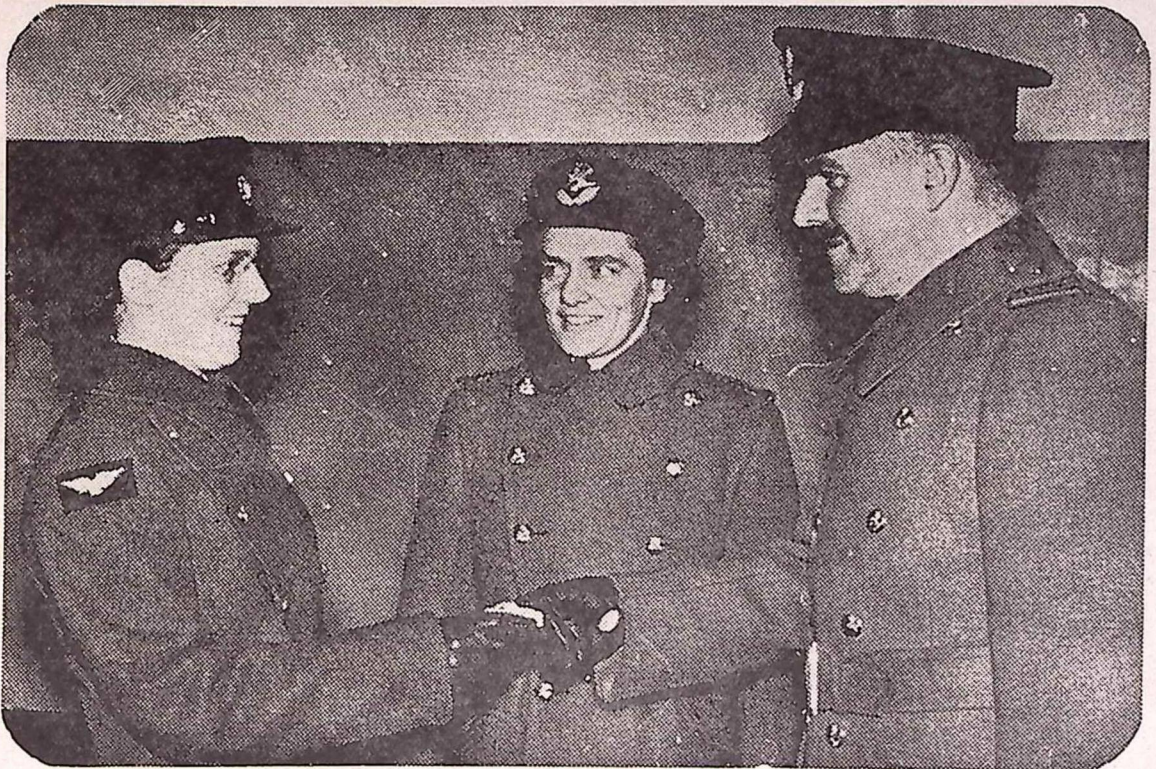
We can well imagine the heart-to-heart chats your sergeant-majors have had with you. (Tut, tut, boys mustn't say the naughty word and such trifles.) But don't blame us. Instead, if you see us dreaming (not sleeping) in class

it may be of the lad who was left behind or the swell Easter hat we are NOT going to pick out in a week or two!

Soon we will be leaving St. Thomas and heading either east or west. (No more arguments about that question, please.) Before we pack up we wish to say we have enjoyed our stay at T.T.S. Our quarters are swell. The buildings here are beautiful and the sun rising behind them as we have roll call every morning is really something. (Personally it looks awfully like the moon at times.) Whether we are in Claresholm or Moncton, memories of our lectures, that drill competition, the mess hall and so many other things will come to mind. Thanks to all the Airmen who made our brief sojourn as pleasant as it was.

\* \* \*

### *Gold Medalist of Airwomen*



Miss M. T. McGee (left), of South Devon, N.B., receiving the School Gold Medal for outstanding work in training during the first graduation ceremony for Airwomen held at the R.C.A.F. Technical Training School on Friday afternoon, March 6th, when the first class of Hospital Assistants to receive their training here was graduated. The medal is being presented to A.W.2 McGee by Wg. Comdr. J. H. Keens, Officer Commanding the Station, and in the centre background is seen Assistant Section Officer E. M. Ward, senior officer of the Airwomen at the T.T.S.

THINGS WE WOULD LIKE TO KNOW

By A.W.2 McLeod

Which clock in the Pass Office to place one's trust in?

How many stairs we climb per day?

When they are going to issue us a street guide of the Main Buildings?

What happened that A. D. didn't have a date one evening last week?

What the world at large thinks of our "glamour" boots?

If they'd like to know what *we* think of them?

Why *we* can't sit up front with instructor?

Who has the mail? (male)?

Personal Roll Call

Miss Ward—Our diplomat.

Miss A.—Our Democrat.

Corporal—Quiet as a mouse.

Sergeant—All over the house.

Gals—You count 'em, I'm too busy.

Look them over, you'll be dizzy,

Gals from East, Gals from the West

And some who like Ontario best—

Earnest ones who live to learn,

And those who for a late pass yearn!

So call the roll! Whate'er befall,

We're in to the finish, one and all!

\* \* \*

A sharp answer may indicate a dull mind.

\* \* \*

Administration Staff for Airwomen



The above photograph shows the administration staff for the Airwomen at the R.C.A.F. Technical Training School, where courses of training for Hospital Assistants and Equipment Assistants have been established. The first class for the former graduated on Friday, March 6th, with a new class arriving at the Station on Saturday, March 7th. The course for Equipment Assistants, which was the second to be started, is a somewhat longer one. In the centre of the front row above is Assistant Section Officer E. M. Ward, who is the senior officer, a teacher in civilian life, who came to Canada from Southbourne, England, seven years ago. At the left is Assistant Section Officer J. B. Atkinson, of Embro, a physiotherapist and laboratory technician in civilian life, who is in charge of Equipment, Recreation and General Welfare. At the right is Nursing Sister J. F. Young, of Acton, a graduate of Toronto General Hospital, who is the instructress for the Hospital Assistants' Course. In the back row at the left is Sgt. M. Kennedy, of Indian Head, Sask., a high school teacher in civilian life, and Cpl. M. M. Willson, of Toronto, a former dietitian.



# AMONG THE SQUADRONS

## 1 SQUADRON, 1 WING

### SPORTS

The badminton team has come along a lot better this past month. The boys are all in there trying hard to win the C.O.'s Trophy for No. 1 Squadron.

Captain Simmons and his volleyball team of Argue, Melton, Thomas, Shamovitch, Saltman, Cassidy and Harrison are doing very well. They come out night after night and have a lot of fun.

Our basketball team is the best on the Station when we are all clicking together. We have a great bunch of sportsmen in our basketball team. "Punchy" Woods, "Tubby" Murray, "Yank" Wasserman, "Droop" Ferguson, "C.B." Maskell, "Rosey" Rose, "Pork Chops" Prokopcheek, "Red" Allan, "Billy" Boyd and "Longboat" Harris.

We have the best sports Squadron on the Station and we want to keep it this way so, fellows, whether you can play these games or not, come out and have some fun.

The Squadron would like to welcome three more corporals in the Electrician Trade, who have just returned after a year's absence.

Congratulations are in store for Duncan, Ferris and Cudahey of E-18 for their promotion to instructors. The remainder of E-18 fared better than any other Entry that has been posted from this Station.

No. 1 Wing boys are training hard for the inter-wing bouts on the 26th of March. We sincerely hope and believe that there will be a different tune.

\* \* \*

## 2 SQUADRON, 1 WING

*By Speedmo-Gus*

Congratulations are in order to the men of the 88th Entry for their fine showing in the Drill Competition for the month of March. But, alas! They will not be able to compete for April's Trophy as they are being posted the day of the competition.

### IN AND OUT AROUND THE ORDERLY ROOM

I wonder why a certain Flight Sergeant spends so much time at the Y.M.C.A. in St. Thomas.

I wonder why Cpl. Crockett keeps getting after the staff for haircuts. Maybe he is getting a cut from the barber.

Sgt. Gutsell, it was nice to see you receive the Drill Trophy, but you didn't have to drop it on the floor in front of the C.O.

Cpl. Allan—A good Discip, on leave.

Cpl. Bayliss—Down at Fingal doing physical jerks and throwing a rifle around.

L.A.C. Keown—A good clerk posted to Ottawa.

Sgt. Brennan—Be careful or the "Little Pink Elephants" are going to catch up to you.

\* \* \*

## 3 SQUADRON, 1 WING

*By Cpl. Ollivier*

There is a certain Flt. Sgt. in our Squadron, incidentally on "A" Floor, who does not object to being wakened early in the morning, even before reveille, but don't forget the spot of tea.

An A.C.2 in our Squadron, still fortunate enough to drive a car, drove up to a gas station and instead of requesting the usual one dollar's worth asked for only seventy-five cents' worth. When asked as to why the reduced amount he said: "I am trying to wean the car."

An N.C.O. in our gang said that his wife had an even temperament. Yes, he said, "even" is right; she is mad all the time.

Three N.C.O.'s in our Squadron left recently, having remustered to Aircrew. The best of luck is extended to them, and we hope they will enjoy their new environment. However, as a word of warning, if they are going to be pilots, let's hope they will stay in the air and don't start this "pile it here and pile it there" stuff.

Our witty clerk of 3 Squadron, Sgt. Meadon, is posted to R.C.A.F. Headquarters at Ottawa. Our loss, their gain. My, won't their baskets be empty every night!

### CONVERSATIONS CAUGHT CASUALLY

Two A.C.2's were discussing why they had to lay their holdalls on the bed all day. "Well," said one, "our toothbrush is left open to the dust and grit." "Yes," said the other, "but then, when you clean them, you can grit your teeth and really go to town on this war."

Jack: "Say Bill, my back is itchy; what is that a sign of?"

Bill: "It's a sign that your back needs scratching."

Apparently discussing mother-in-laws, two lads from the 88th Entry were heard to say: "Yes, my mother-in-law is quite temperamental, 98% temper and 2% mental."

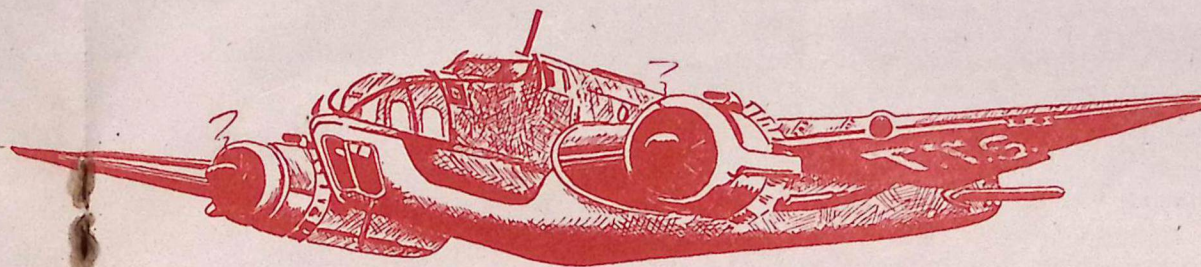
Then the other lad said: "Why, my wife is an angel, always up in the air and harping about something."

### I WONDER . . .

If the Corporal knew what he was doing when he sent the trainee for a pail of airscrew pitch to fill up the blade track with?

Or the time he sent the fellow for the pail of steam

# WORK



# SAVE

E. & A. T. S.

2 Sq. - 2 Wing

3 Sq. - 2 Wing

1 Sq. - 1 Wing

3 Sq. - 1 Wing

2 Sq. - 1 Wing

Civilian

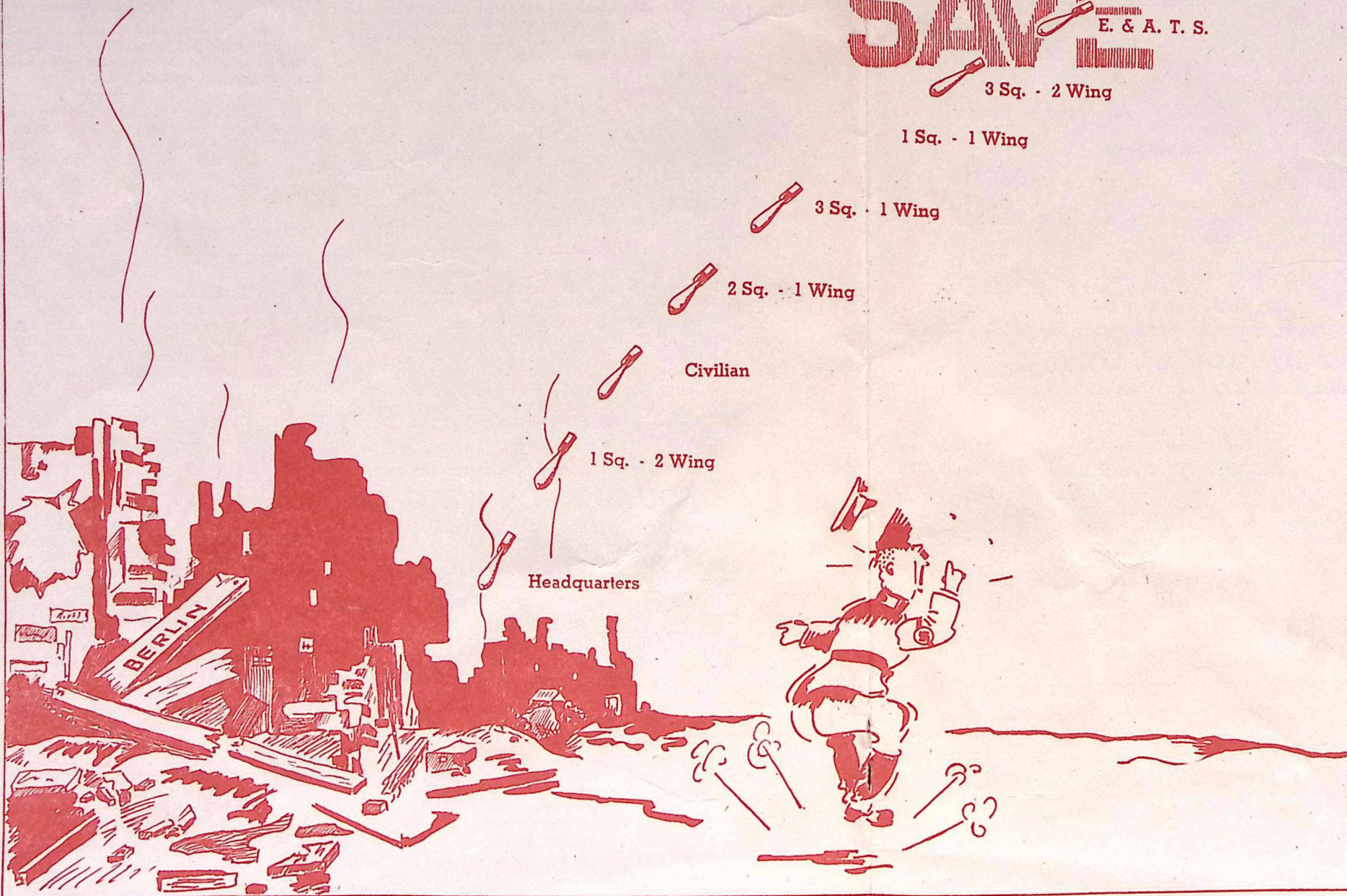
1 Sq. - 2 Wing

Headquarters

# LEND

YOUR  
SAVINGS  
TOTAL  
\$36,254  
NOW

H. E. Bishop



to wash the aircraft with?

Or if he got mad when the trainee looked for a pair of scales in stores, because he was told to lubricate the counterweights of the airscrew?

**I UNDERSTAND**

That an N.C.O. said he could not fill his Oxford with gasoline because it used petrol.

And the trainee had a hard time looking for his mother-in-law in the aircraft when he was sent to look for the crank.

**THE DEFINITION OF A GOOD MECHANIC**

A good mechanic is a man who can repair an aircraft and leave it in better shape than when he found it.

Material will be accepted for THE AIRCRAFTMAN by the new editor, Cpl. Longbottom, Room 4, "B" Floor, No. 3 Squadron, or will be accepted by Sgt. Maguire.

**MONTREAL JERKS IN BAY 3**

Here is a story that is sure to please  
 Even Mahoney, who's down on his knees.  
 In order of bunks, the first to appear  
 Is Poulin, the man with a craving for beer.  
 Next on the list dear Boland we see,  
 The lad with the lass down by the sea.  
 Directly below is Zinman who's grieving,  
 Has us all worried about extra T.Ting.  
 Away in the corner McConnell does lay,  
 Reading pink letters he gets every day.  
 Reclining on his bunk Gelinus we spy,  
 Thinking of the French girl who gave him the eye.  
 The next of the mob is Mother Lee,  
 Who is off to Toronto, Little Norway to see.  
 Then comes that lucky lad, Chicky,  
 The guy that keeps his hair nice and sticky.  
 Sprawled on his bunk amid the usual mess  
 Is Mahoney proudly beating his chest.  
 Cader, the dope, who sleeps by the wall,  
 Who looks at his books and learns nothing at all.  
 Then comes Lamont, the last in the class,  
 Who goes back entries pretty damn fast.  
 Now these are the boys from gay Montreal,  
 Who've come to beat Hitler, Mussie and all.

—A.C.2 Lamont, R. W.

**LOST AND FOUND**

LOST—One cotton swimming suit, size 32. Finder please return to Cpl. Laporte.

One fancy studded combe. Finder will please return it to Cpl. Conkey, No. 3 Squadron, 1 Wing. Valued as keepsake.

FOUND—One pair knuckle dusters engraved "P.P.M. Sgt." in No. 3 Squadron, 1 Wing.

**DRILL TEAM**

We, the staff of No. 3 Squadron, wish to congratulate the new drill team, made up of boys from the 95th and 97th Entries, for their smartness and effort at drill practice. That's the spirit boys, keep up the good work and you'll surely bring home the trophy.

The staff and trainees of No. 3 Squadron wish Sgt. Meadon every success at his new posting. In the Sgt. the trainees will lose a good friend, a man who was always willing to accommodate with a cheerful air.

Many artists' models achieve success only after years of attireless effort.

**1 SQUADRON, 2 WING**

**90TH ENTRY**

By A.C.2 Parlette, T. G.

Spring is now here and with spring comes poetry (?). Here goes!

Spring has sprung,  
 The grass has ris,  
 I wonder where the boidies is?  
 The boids is on the wing,  
 Ain't that absoid?  
 I always thought  
 The wings was on the boids!

**WE'VE ALWAYS WONDERED . . .**

Why Starky isn't satisfied with one gal when he steps out.

How Parlette can call such stuff as you have just read poetry.

If "225" Gregory really could raise a "Fuller brush" on his upper lip. Time will tell!

Why some people stick up for the West.

When the cooks are going to treat us with their "Trade Test" meal.

Just how much suds our little friend, "Bingo" Garland, could pour down the hatch at one sitting.

If "Blondie" Castator's secret ambition is to be a fireman.

If "Baby Dumpling" Campbell is really 20 years old.

\* \* \*

**2 SQUADRON, 2 WING**

By A.C. Scott, D. H.

"News that's hot,  
 Dished out by Scott."

**DOIN'S AT 2 AND 2**

New faces in the Orderly Room this past month include Cpl. W. J. Kyles, who was transferred here from Headquarters. . . . Cpl. R. W. Brown has left for Fingal for the Discip Course there. . . . L.A.C. Stan. Holstead has been transferred to the Wing Orderly Room. . . . During the past few weeks the 85th and 88th Entries departed. . . . The 95th is our newest Entry. . . . A certain clerk is sporting a very fine bit of hair on his upper lip these days . . . reports have it that on a clear day with plenty of sunshine, it actually resembles a moustache.

**INSTRUCTIONS! WHAT TO DO IN AN AIR RAID**

1. As soon as bombs start dropping, run like hell. It doesn't matter where as long as you run. If you are inside a building, run outside. If you are outside, run inside.

2. Take advantage of opportunities afforded when air raid sirens sound attack warning, for example:

- (a) If in a bakery, grab some pie or cake, etc.
- (b) If in a tavern, grab a bottle.
- (c) If in a movie, grab a blonde.

3. If you find an unexploded bomb, always pick it up and shake it; the firing pin may be stuck.

4. If it doesn't work, place it in the furnace. (The fire department will come later and take care of things.)

5. If an incendiary bomb is found burning in a building, throw some gasoline on it. You can't put it out anyhow, so you may just as well have some fun.

6(a). If gasoline is not available, throw a bucket of water on it and lie down—you should be dead. (b) The properties of the bomb free the hydrogen from the water with rapid combustion (in fact, it will explode with an awful crash).

7. Always get excited and holler bloody murder. It will add to the fun and confusion and scare the kids.

8. Drink heavily, eat onions, limburger, etc., before entering a crowded air raid shelter. This will insure you a little privacy.

9. If you should be the victim of a direct hit, don't go to pieces—lie still and you won't be noticed.

10. Knock the air raid wardens down if they start to tell you what to do. They always save the best seats for themselves and their friends, anyway.

### THE GALLANT NINETY-FIRST

(Contributed by A.C.2 Waters, A. H.)

Here's to the gallant 91st,  
Who are noted for their fame,  
By stage coach and by Toonerville,  
To T.T.S. they came.

They received a hearty welcome  
From the C.O. to the S.P's,  
Of course there was the odd wise guy  
Who referred to them as "rookies."

Two months have passed since that first day,  
And now they know the score;  
No one calls them rookies now,  
They're veterans to the core.

Corporal Mouldey is their N.C.O.,  
A stalwart lad is he;  
He worketh like the ant  
And stingeth like the bee.

A note to all you wise Discip's  
Who really think your tough:  
We hope you have found the 91st  
Are made of real tough stuff.

Attention, all the Trade Board,  
When testing men like these,  
Remember men with brains are hard to find,  
So be liberal with your "B's."

At last this poem is ended,  
And in closing may I say:  
To win this war takes money,  
So buy your War Stamps today.

\* \* \*

## 3 SQUADRON, 2 WING

### SQUADRON GOSSIP

By Cpl. Jorgenson, G.

#### THINGS WE WOULD LIKE TO KNOW IN NO. 3 SQUADRON

1. Why our blonde heart throb purchased a new radio? Is he settling down?
2. Was it due to a flame that Cpl. Boyne was in the spotlight at the Corporals' Dance?

3. If our Galt instructor took a few days' rest before going home on leave?

4. If the heat was on when V. Rea strategically withdrew to 1 Squadron?

5. Why our Flight Sergeant needed a new greatcoat?

6. If Cpl. Burt's intellectual research is due to his association with his friends from Manitoba?

7. Why Cpl. James is coming home in a taxi before ten?

### SPORTS

Several fortnights have passed since No. 3 Squadron athletic organization have been strong enough to hold the coveted Sports Trophy. Only one month of winter sports remains and in that time let us go after the prize.

The "change over" left our Squadron with no more than two or three Entries at one time and good athletes were as scarce as hen's teeth. During the past months, however, much ground work has been laid and a formidable line-up stands ready to take the field for next month to make it three dots and a dash.

The basketball team, which has been taken over by Cpl. Auttonson (a new and welcome member of our Squadron), and with the reinforcements which have been coming in things are looking good.

Cpl. Cassidy says his volleyball team can't be beaten (that's a challenge, boys! Defend it!). Incidentally, Cpl. Cassidy is also new blood in No. 3 Squadron. Watch him, fellows!

Make April the Victory Month; at least never let it be said we weren't in there. Give the teams your support, boys. Play or root.

### HIDDEN GLAMOR

The lads of the air, they call us;  
They speak of our glorious fame;  
On the front page of every paper  
They tell of some pilot's name.

Connected with some deed of valor  
Performed in a sky of blue,  
The usual Heinkel or Dornier  
Which crashed to the earth in two.

But there's a chap who gets no medal,  
And you never hear his name;  
He does not soar through the bright blue sky  
Or pose for the news by his plane.

His job is not romantic,  
He is not in the clear blue sky,  
But your heroes can't do without him,  
So now I will tell you why:

He's up so oft in the dead of night,  
He's there when the twilight falls,  
Pulling his weight to keep up his kite  
Whatever else may befall.

So the next time he's there in the newsreel,  
A plane and its smiling crew,  
Just think of the lad who kept it aloft,  
Though he's only an A.C.2.

So whenever you praise a pilot  
When the enemy falls in a wreck,  
Just think of the lad you never will see,  
Yours truly—

A HUMBLE FLIGHT MECH.

If we were asked what is the last word in airplanes  
—we'd yell—"JUMP!"

**HEADQTRS. SQUADRON**

By L.A.C. Hewlitt, A. W.

We welcome our new O.C., F.O. T. H. O'Rourke, who has recently taken the place of F.O. R. K. Armstrong. In welcoming him, I know that I have the Squadron's approval in saying that we shall give him our fullest support.

Now that Headquarters Squadron has lost most of its good basketballers it is up to the "Valiant Five" to carry on. We certainly need more players in every department, but it seems to be a feeling with the various athletes to "let Joe do it." What do you all say about turning out for either of the various sports—badminton, basketball or volleyball? If you can't play, surely you can support the team; a little pat on the back goes a long way.

Our Station Band has a number of "Swingsters," now organizing an orchestra. By all reports, their band will be excelled by none. With the T.T.S. backing we wish them success and with the aid of Flt. Sgt. Green we know we will be furnished with top rate music. Some of the recent additions to the band are top flight musicians from famed bands such as Stroud's Orchestra, Toronto; Frank Bogart's Club Top Hat, Toronto; Dick Avonde's Band; Frank Crowley's Band, London.

Headquarters Squadron extends sincere sympathy to Bandmaster W.O.2 Everson in his recent bereavement.

Thanks to fine teamwork, the basketball team finished on top of the heap for February. Our volleyballers have been working hard and although they only lost one game in February, had to be content with second place, and likewise for the Badminton team.

However, all other things being equal, a prediction is now being made by the Knute Rockne of H.Q. and Flt. Sgt. Park that H.Q. will definitely win the C.O's Trophy for the month of April.

The staff of the Recreation Hall have noticed in the past two weeks a steady increase in attendance at the Hall. Could it be the influence of the Women's Division, or have the boys become extra studious?

The Service Police will certainly miss happy-go-lucky Cpl. Holland, commonly known as "Chris" Holland, who has recently been transferred to 1 Squadron, 1 Wing. What is one branch of the Service's loss is another's gain. The Service Police must have pulled up their socks by the new list of promotions.

**JUST A THOUGHT**

'Twas in September '39  
When Hitler committed an awful crime;  
He showed all Europe his Aryan horrors,  
And left us in the midst of sorrows.  
It's three years now since that fateful day  
When Hitler signed our peace away;  
Soon Jerry came and dropped some bombs,  
For England's sake buy Victory Bonds.

The conservation of gasoline has brought sunshine into some lives. It is now a mark of patriotism to have a cigarette lighter which won't light.

**PLANEFACTS**  
HARLAND

By M. W. Harland, Headquarters Squadron

Most of the flying trail-blazers led hectic lives, bitter and sweet careers full of ups and downs. The late Sir Charles Kingsford-Smith, once rated the world's greatest flyer, had his share of unhappiness. One poignant experience stands out above all others, except, of course, his tragic end. In 1927 Kingsford-Smith, C. P. T. Ulm and Keith Anderson went to California to try to finance a flight across the Pacific to Australia. Before they made any progress Anderson went back to Australia, discouraged. Then the fortunes of Kingsford-Smith and Ulm improved. They arranged backing for the trip, and fitted out the "Southern Cross," in which they made a successful crossing of the Pacific. Some time later Anderson sued for participation in the profits of the venture and lost the suit. His former partners then generously gave Anderson sufficient money to buy himself a small airplane. Later Kingsford-Smith essayed a flight from Australia to England and was forced down in wild Australian territory. A widespread search was organized in which Keith Anderson participated. Kingsford-Smith's party was found, all safe. In the meantime Anderson and his flying partner had been forced down in a remote region, where they died before they were found. Anderson left a message written on the airplane, part of which read:

"Since April 12th all efforts—of course, the same next to nil, through having no water to drink—directed on obtaining sufficient power from engine to permit of successful take-off. No take-off able to be attempted since April 11th, due to increased debility from thirst, heat, flies and dust."

Dr. Margaret Chung, American born Chinese, is adopted mother to hundreds of aviators. These include many fighting for the United Nations, many on American airlines, Ferry Command pilots and leaders in aircraft factories. Dr. Chung gives jade buddhas to each of her sons and tries to keep in touch with them all.

The Russian industrial system, while not extensive for the size of the nation, is still far more substantial than is commonly realized.

No one outside of Russia knows exactly what there is, but in the Ural district one plant alone produces 150,000,000 gallons of aviation gasoline a year. Far back in the Russian interior there are dozens of huge aircraft plants operating night and day.

At the time the United States entered the war the U. S. Army had not yet ordered any of the Douglas B-19 bombers.

In the November, 1941, issue of *Esquire* Robert W. Marks, mechanical expert for that publication, tells an interesting story of a Consolidated bomber being set upon by four Messerschmitts while on its way to England. Mr. Marks, who seems to be in a position to know, makes the surprising statement that the Consolidated ran away from the Messerschmitts at 425 miles an hour.

Office of Production Management aircraft production figures for May, 1941, lists 700 combat planes completed. Allowing for normal progressive acceleration, the average monthly production for the year 1941 probably was somewhere in the neighborhood of 1,000 a month. This 12,000 for the year total does not include trainer planes, of which there were about an equal number produced.

In 1919 Harry Hawker and Lt. Comdr. MacKenzie-Grieve tried but failed to fly the Atlantic. For a short time after they were forced down in mid-ocean they were worth more dead than alive. The London Daily Mail, presuming them dead, arranged to pay \$50,000—prize money for a successful ocean flight—to their estates. When they turned up alive days later the newspaper awarded them \$5,000.

On his around-the-world flight the late Wiley Post, travelling east, flew over Ireland and England without even seeing either country, going on to Germany. On many occasions on the same trip he saw nothing at all, not even his controls. He admitted that he fell asleep dozens of times on the last laps of his record-breaking solo trip.

Walter R. Brookins, one of the first pupils of the Wright Brothers, and the first of all professional pilots, became chief instructor of the Wright Flying School in Dayton, Ohio, when he had but two solo flights to his credit and less than four hours in the air.

A continuous volunteer aircraft detection service now protects all the coastline of the

U. S. A. From all walks of life, men and women report at their appointed times and take up watch for strange aircraft. The cross-checked system is efficient and already well co-ordinated.

Magnesium, the world's lightest utility metal, was once worth \$5 a pound in the U.S.A. Now it is worth 20 cents. This very useful element is literally dirt cheap, as it is in the ground and the sea in inexhaustible quantities.

Anthony H. G. Fokker, one of the best-known men in the world of aviation, has been flying for years and probably always was familiar with rules, regulations and conduct pertaining to aircraft. Yet in 1930 he was arrested for giving an exhibition of aerobatics in the vicinity of Roosevelt Field at Mineola, New York. During the court proceedings it became known that Mr. Fokker did not even have a pilot's license at the time.

Germany, consistently more Diesel minded than other nations, is reported to have thousands of Diesel bombers waiting for the time when they run short of gasoline. The name Diesel will gain increasing prominence in aircraft circles as time goes on, and the weight of the engine is reduced. Rudolph Diesel was a German, born in France, who met with an untimely and very unusual end. In 1913 he boarded a steamer in Belgium and set sail for England. Nothing was seen of him again. His disappearance was an utter mystery. There seemed no apparent reason for him to end his own life, and he had made no preparations for an early departure from this earth. Investigations never revealed whether he was a victim of personal vengeance, of self-destruction or of international military intrigue.

\* \* \*

### THE MECHANIC'S CREED

(By L.A.C. Jim Denniston, in *The Ottawa Citizen*)

Maybe we're only the ground crew,  
And perhaps we'll never fly;  
We only work on the grounded planes  
To get them back in the sky.

We don't get pretty golden wings,  
And we lack the crowd's applause;  
We can't tell tales of fights and things—  
We just find out what the trouble was.

Maybe we won't fly the big ones,  
But you'll find us over there;  
Maybe we won't be firing the guns,  
But we'll keep the planes in the air.

THE SHUTTER BUGS

By G. W. Burrell, Y.M.C.A.

What happens when we click the shutter?

To take pictures we need light, a lens, a light-tight box, a shutter, a light-sensitive photographic emulsion and a subject.

1. *All objects reflect light rays* to a greater or lesser degree. The objects which we say are light in color are the ones which reflect a large amount of light, and the objects which we call dark are those that have little or no reflecting qualities. Light rays travel in straight lines unless bent by a lens or prism.

2. *The lens of a camera* is the medium of transmitting and bending the light reflected from the subject to the light-sensitive emulsion or film, in such a way as accurately to reproduce the subject in miniature. The quality and clearness of this resultant *subject in miniature* depends on a number of technical points which will be discussed in a later issue of this magazine under the heading "OPTICAL EQUIPMENT." (In this article we shall use as our example the inexpensive box camera.)

3. The camera body or light-tight box is essential so that *only the light passing through the lens strikes the film.*

4. The shutter is the device that times or decides how long the film should be exposed to the light passing through the lens.

5. *A light-sensitive emulsion.*—The fundamental components of a photographic emulsion are a cellulose, glass or other suitable base and a layer of very finely divided silver nitrate (light-sensitive crystals) suspended in a layer of gelatine. These silver crystals which have been exposed to light go through an invisible chemical change and when the film is immersed in a "reducing" liquid called a developer this change becomes visible as crystals exposed to light turn black.

First we have our subject (A) which reflects light rays (E) through lens (B), giving the image on film (D). The shutter (F) determines the length of time the film (D) will be exposed to reflected light rays from the subject. A study of a diagram would show that the image in the camera is in the reverse of the

subject or, in other words, the subject will appear at (X) on the film.

As we have mentioned above, the light that has struck the film (D) causes an invisible change termed the latent image after exposure and then when the film is immersed in a reducing solution (developer) the exposed silver particles turn black in proportion to the intensity of light to which they were subjected. This film is then "fixed" in a bath of sodium hyposulphate which removes particles of silver which were not turned black by exposure, leaving all these parts of the film perfectly clear.

It is now quite obvious that the parts of the subject which are white reflect more light to the film subsequently turning (after development) the corresponding image on the film black. Thus we get an image in reverse which is termed a negative.

The negative is not much use to us as it now stands so we must make a positive or finished picture. To do this we place a piece of paper coated with light-sensitive silver crystals in close contact with the dull or emulsion side of our negative. Having done this, we hold the paper and negative up to a light so that the light rays pass through the negative, thereby invisibly printing its image on the sensitized paper. Now we place this exposed paper in the developing bath. This is where the real fun out of doing your own comes in. If the exposure is correct the image should start to appear after about fifteen seconds and then gradually deepen out and become more brilliant. The average normally exposed print should develop out in one minute. After development the print is rinsed and then "fixed" to remove all unexposed silver salt, after which the print should be washed for at least thirty minutes. The drying is accomplished by placing the print face down on a smooth ferrotype tin, squeezed down with a roller and left to dry. This imparts a shiny or glossy finish to the print. If a dull finish is required the prints may be left to dry face down on blotters.

\* \* \*

DID YOU KNOW?

—that a cardboard reflector will add a third to the strength of your light?

—that moving objects are best taken at a 45 degree angle?

—that outdoor portraits taken in dull weather are usually better than when taken in blazing sunlight?

—that the average shutter speed in snapping a person walking should be 100th of a second?

—that the camera should rest INDEPENDENTLY at speeds lower than a twenty-fifth of a second?

—"Wings Abroad."

RESEARCH AND DEVELOPMENT IN AIRCRAFT

THE COMPASS IN A TURN

"Northerly Turning Error" is not too accurate a term for the phenomena which occur in an aeroplane compass whenever the machine is made to perform any evolutions which put the compass card at an angle to the surface of the earth. One of the phenomena is more marked when turning off a northerly course, yet compass inaccuracies tend to occur to a greater or less extent whenever the level of the compass card is upset, no matter in what direction the aeroplane may be heading. For simplicity the term "card" is used here to denote the pivoted magnetic system of a compass, although verge ring compasses have no card in the strict sense of the term.

In considering the forces acting upon the compass needles, it is essential to bear clearly in mind the relation between the angle at which the earth's lines of magnetic force pitch towards the earth's surface (67 deg. in S.E. England) and the angle which upon occasion the compass card makes with the earth's surface.

The level of the compass card may be upset in various ways. The centre of gravity of the suspended system is below the pivot and therefore in a side-slip the inertia makes the weight lag behind, tipping the card in the direction of the slip and tipping it in the reverse direction as the side-slip ceases. If there is acceleration the weight again lags behind and the card tips forward with the reverse effect if there is deceleration.

Centrifugal force as a machine banks round keeps the card approximately parallel to the plane of the machine and therefore upsets its level in relation to the earth. Even in a flat turn the inertia of the weight below the pivot tends to carry it still in the direction in which the machine was originally heading, thus resulting in tipping the card.

When these disturbances in the level of the card occur there are two separate though allied phenomena which come into play. Both are due to the change in the angle of the compass card in relation to the earth's lines of force. Let these two phenomena be called (A) and (B).

A useful way of illustrating phenomena (A) is to consider what happens when a machine is "zoomed," as shown in Fig. 1.

The machine is travelling due north. At (a), where the machine is level, the pull on the north-seeking ends of the compass needles is forward and downward. The vertical component of the earth's magnetism is compensated for. The needles and card are level and obey

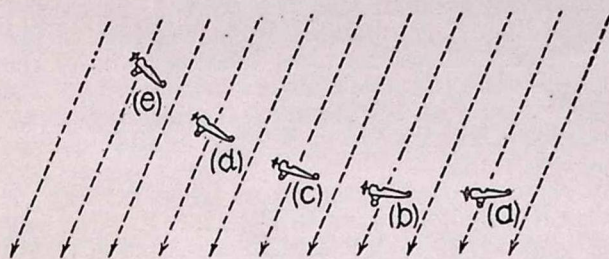


FIG. 1.

the horizontal directive force, the compass accurately indicates direction.

As the machine curves upward, centrifugal force keeps the card approximately parallel to the plane of the machine. When the aeroplane has risen to a point where the lines of force are at right angles to the compass card the needles entirely lose their horizontal directive force. This occurs approximately at (c).

Continuing the curved course of the machine to (d) and (e), the conditions are found to have changed completely. The earth's North Pole is now tending to attract the north-seeking ends of the compass needles backwards. If the compass had a quick-enough period of swing the card would completely reverse itself and indicate a southerly course with the machine still heading due north. As a "zoom" is only a matter of seconds, there is not time for the card time to swing round, but evidently, from the angle of the lines of force, the card receives an impulse to do so.

This tendency to complete reversal not only occurs as in Fig. 1. It occurs also on a steeply banked turn off a northerly course. Supposing a machine is travelling north-east and then banks round to south-east. The lubber line moves round to the right and it ought to leave the north mark of the card to the left.

Fig. 2 (a) shows an aeroplane banked at an angle of 45 degrees going away from the spectator. It is half-way round its turn in the

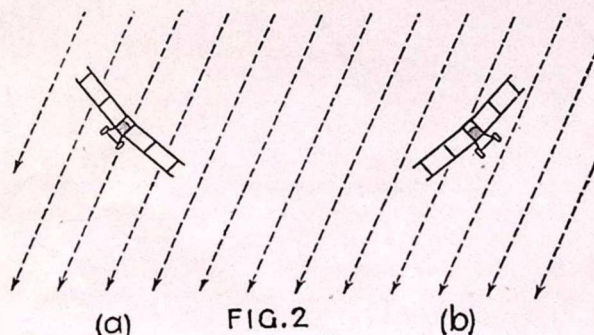


FIG. 2



position of maximum bank and at the moment is heading due east.

It can be seen that the pull of the earth's magnetism has changed from the left to the right side of the machine, tending to move the card completely round to a position where the error would be 180 degrees, if there was time. Banking from N.W. to S.W., a similar change occurs.

There is a different effect when turning off a southerly course, as in Fig. 2 (b). The pull of the earth's magnetism in this case does not tend to reverse the card.

The second phenomenon mentioned as (B) may best be demonstrated by considering Fig. 3, which represents diagrams of various perspective views of a compass card in a machine proceeding in an easterly direction, starting horizontal at (a) and then zooming up through positions (b), (c) and (d) until it is vertical at (e).

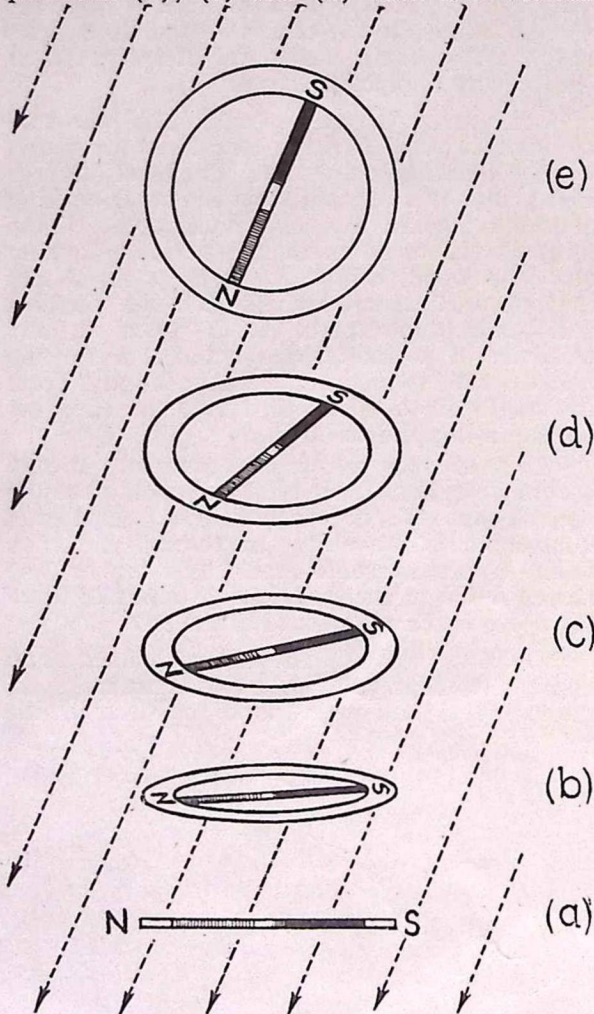


FIG 3

at (e).

North is to the left of the illustration. The spectator, outside the machine, is supposed to be looking from the west as the machine heads away from him and curves up in an easterly direction.

The figure shows that such a "zoom" carries the card into a position in which the north-seeking ends of the needles tend to droop 67 degrees out of their proper position.

These "zoom" illustrations for both phenomena (A) and (B) are not given with any idea that they are of any use to a pilot carrying out such evolutions. They are simply a means of showing diagrammatically that the card may get into positions in which these two separate phenomena occur, i.e., the phenomenon of a sudden and complete reversal of pull on the north-seeking ends of the needles with the tendency to an error of 180 degrees, and the phenomenon of an immediate tendency to dip directly the card is put at an angle to the surface of the earth in certain circumstances, the possibility of error in this case being limited to 67 degrees.

In practice, phenomenon (B) is most marked when banking round from N.W. to N.E. or vice versa, or when banking round from S.W. to S.E. or vice versa, with the machine heading due north or south in the middle of the turn at the moment of maximum bank.

Suppose the bank, in a tight turn, is so drastic that it brings the wings and the compass card into a vertical position at the middle of the turn when the machine is heading due north or south. At that moment the earth's magnetism will be trying to pull the north-seeking ends of the needles down to an angle of 67 degrees.

The card has a tendency to dip towards the inner side of any banked turn when the heading is on a northerly course, and to move in the opposite direction when banked turns are made off a southerly course.

With modern aperiodic, dead-beat compasses, there is little time during a banked turn for the card to move far before the machine flattens out again, but the card does start to move as described and takes some time to return to its proper position after the machine has flattened out.

In more southern latitudes, where the "dip" is less than 67 degrees, the phenomena are modified. With a "dip" of 40 degrees, the possible error of phenomenon (B) would be 40 degrees, and the banking in Fig. 2 (a) would have to be steeper to entail a complete reversal of magnetic pull. At the magnetic Equator, where the lines of force are parallel to the earth's surface, these phenomena are not in evidence at all.

# TECHNICAL TOPICS

## STEELS AND THEIR HEAT TREATMENT

(Continued)

In the first installment of this article reference was made to the effects upon a medium carbon steel of hardening followed by tempering. Two further points may be noted in this connection. The first is that the steel referred to, S.A.E. 1045, if "worked" at red heat (i.e., rolled, hammered or otherwise formed to the required shape) and allowed to cool in air without further heat treatment, would have an ultimate strength in tension of around 60,000 lbs. per sq. in., and an elongation of 25% or a little more. Thus hardening and tempering at 800 deg. F. practically doubles the strength of the steel at the cost of some loss in ductility, while tempering at 1300 deg. increases the strength more than 50% without loss of ductility.

The second point is that the higher the carbon content of plain carbon steels the more marked is the effect of heat treatment. In a steel containing .85% or .95% carbon the benefits of heat treatment on the properties of the steel would be even greater than in the example quoted.

### Alloy Steels

Alloy steels are plain carbon steels to which one or more alloying elements have been added during the process of manufacture. The elements most commonly met with in alloy steels are nickel, chromium, manganese, molybdenum, vanadium and tungsten. These elements, as in the case of the carbon, are held in solid solution in the iron. In some steels, such as the nickel steels, only one alloying element is added; in other steels there may be two, or even three.

Alloying elements have quite definite effects upon physical properties of the steel, and most alloy steels are highly responsive to heat treatments.

It should be clearly understood that the steel selected for any given purpose, whether plain carbon or alloy, and the heat treatment which it is given, will be governed entirely by the qualities required. For example, a steel may be selected and heat treated to give the requisite qualities of strength, toughness, ductility, etc., but may not machine easily. It would therefore be unsuitable for components which have to be machined.

Reference will be made later to the properties and uses of some of the more important

commercial alloy steels. In the meantime a few words may be said about their common heat treatments.

Most alloy steels are first normalized at temperatures of from 1550 deg. F. (bright red) to 1750 deg. F. (orange) depending on the steel being dealt with. They are then quenched in oil or water, usually the former, at temperatures between 1400 and 1650 deg. F., the quenching medium and the hardening temperature again depending upon the steel being treated. Finally, as in the case of plain carbon steel, a tempering process is carried out at temperatures ranging from 800 to 1300 deg. F. depending upon the qualities required. The lower temperature will give a strong, hard, rather non-ductile and somewhat brittle steel; the higher will result in a less strong, softer, more ductile and much tougher product.

It should be noted that the selection of a quenching medium will depend upon the rate of cooling desired, and this in turn will depend upon the composition of the steel. For some steels the more rapid cooling of water gives the best results; for other steels this rate of cooling is too drastic, and the slower oil cooling is used. In rare instances brine is used to give rapid cooling.

It should be clearly understood that the foregoing remarks on heat treatments are more or less generalizations. Other heat treatments, such as annealing, case-hardening, etc., are also extensively used to give a steel any specific qualities which may be desirable either in the finished product or in the process of manufacturing the finished product.

Another most important point, which has been touched on before, is that it is impossible to have in any one steel all the qualities which may be desirable in their fullest degree. Manufacturing considerations may demand a steel that will machine readily, weld easily or take a very fine finish. To obtain such special qualities it may be necessary to sacrifice in greater or lesser degree some other desirable quality such as great strength, toughness or ductility.

One final word should be said before leaving these generalities concerning the heat treatment of steels. It is important to note that the weight and size of the component being treated has a considerable influence on the results of any heat treatment. In the case of light components of small cross-section, the

rate of cooling during quenching will be nearly the same throughout the material, with the result that after quenching the steel will have nearly the same qualities throughout. In heavy sections, however, the outside will cool more rapidly than the heart. The same thing occurs in cooling after re-heating for tempering purposes. The result of all this is that whereas in light sections the metal throughout will have, upon the completion of the heat treatment processes, almost the same physical properties, in very heavy sections the qualities of the metal near the heart of the component may differ considerably from those near the skin. Another important point to remember in dealing with heavy sections is that, on account of the more rapid cooling of the outside, unequal rates of contraction are set up throughout the section. The outside cools and contracts rapidly, the metal near the centre cools and contracts more slowly, and the more rapid the cooling process the greater will be the variation in the rates of contraction. This variation sets up internal stresses in the steel which may have a serious effect on its strength. For this reason great caution is required in the cooling of heavy components.

### Case Hardening

In considering the utility of the case-hardening process, two statements which have already been made should be recalled. The first is that hard steels are usually brittle; the second is that low-carbon steels do not respond readily to heat treatments, are usually softer than higher-carbon varieties, but are tough and ductile.

It is often desirable to combine toughness and ductility with a hard, wear-resisting surface. In such a case a low or medium carbon steel could be used and the process of case-hardening resorted to.

In this process the steel is heated in contact with a substance rich in carbon to a temperature in the neighborhood of 2000 deg. F. (nearly white heat). At this temperature the surface of the steel, and the steel for a short distance below the surface, absorbs some of the carbon. This produces at the surface a high carbon steel, gradually changing to the original low or medium carbon steel a short distance below the surface. The high carbon surface steel can be hardened to any required degree by heating and quenching, this process giving a hard high-carbon steel skin over a tough low-carbon core.

### Commercial Carbon Steels and Their Uses

The carbon steels of modern commerce are not usually plain carbon steels. They nearly all contain manganese in addition to the iron,

carbon and traces of phosphorus and sulphur. The manganese content in carbon steels ranges from .3 to as high as 1 per cent.

Low carbon steels, containing from .3 to .6 per cent manganese and .25 per cent or less of carbon, are soft and ductile and have low ultimate strength. They respond only to a very limited degree to hardening, and do not machine readily. They take an excellent surface finish, however, and are improved in both hardness and strength by cold rolling. These steels are used principally in the form of sheet, strip or rod, and are employed in the automobile industry in body and fender work, and for other purposes in which a high finish is required.

Increasing the manganese content of these low carbon steels up to 1 per cent gives them increased strength and better machining qualities. It also improves their response to hardening.

The medium carbon steels usually contain from .6 to 1 per cent of manganese. These steels respond well to heat treatment, are stronger than the low carbon steels and usually machine better. They are used for a wide variety of purposes where medium strength is required in conjunction with such properties as weldability, machineability and forgeability.

The high carbon steels usually have about the same manganese range as the medium carbon group. They respond readily to heat treatments, are capable of taking on a high degree of hardness, and are stronger than the lower-carbon varieties. They have a wide range of uses such as springs, washers, hard-drawn wire, cold-rolled bars, clutch discs, agricultural machinery, keys, cotter pins and other purposes for which their hardening and tempering qualities render them suitable.

The carbon steels lack the high qualities and special properties of certain of the alloy steels, but they possess the advantage of low cost.

### Free Cutting Steels

These steels are a variant of the ordinary carbon steels in which the sulphur content has been increased from around .05 of 1 per cent to from .1 to .3 per cent. These steels are sometimes referred to as "screw stock," and are used where good machining qualities are of first importance as in the manufacture of screws, studs, bolts, etc., in which great strength is not required. They contain from .08 to .45 per cent carbon and from .6 to 1.6 manganese. The extra sulphur is added to improve the machining qualities, but it does this at the expense of strength and toughness. These steels do not, as a rule, accept heat treatments, although certain varieties case harden

satisfactorily.

### Alloy Steels

There is a very large variety of alloy steels on the market, and by selecting a suitable steel and giving it suitable heat treatment a product can be obtained suitable for almost any mechanical purpose. Some have great strength, some great hardness, some great toughness, some great ductility; some have rust-resisting qualities, others resist the effects of heat, while yet others are non-magnetic.

Although the qualities which any given alloying element impart to a steel may be either modified or emphasized by subsequent heat treatment, the following paragraphs state in a general way the effects which such elements have upon the qualities of steel:

1. **MANGANESE.** The commercial carbon steels contain up to 1 per cent of manganese. In such proportions the addition of this element improves both the hardening and machining qualities of the steel and tends to increase its strength without causing brittleness. In larger quantities, manganese has curious effects upon the steel. If the manganese content is increased beyond 1.5 per cent the steel begins to become brittle, and at around 5 per cent the metal becomes glass hard and so brittle that it can be pulverized under the hammer. If the manganese content is further increased, however, the steel once more begins to regain toughness and ductility. Hadfield manganese steel, containing 12 per cent manganese and .8 to 1.25 per cent carbon, is strong and has the peculiarity of combining great hardness with ductility. This steel is peculiar in another respect as well, since the ductility is brought out by heating followed by quenching. The normal effects of such treatment is to impart to the steel hardness and strength at the cost of ductility, but in the 12 per cent manganese steel it increases ductility without softening the steel.

2. **NICKEL.** The nickel steels are usually medium carbon steels to which from 3 to 5 per cent nickel has been added. As compared with the carbon steels, nickel steels have a higher ultimate strength and toughness combined with good ductility. They also have good wear-resisting qualities. These properties make nickel steel suitable for a wide variety of purposes. It is used for armor plate, railroad rails and structural work in which the above-named qualities are useful.

3. **CHROMIUM.** Chromium has a wide range of usefulness in the manufacture of alloy steels. The ordinary chromium steels contain from .15 to 1.1 per cent of carbon, .2 to .9 per cent manganese and .6 to 1.5 per cent chromium. These steels are very hard and

tough, and for this reason they are used extensively for armor-piercing projectiles, safes, and for steel castings which are subjected to heavy stresses.

Chromium is also widely used to give to steels rust and heat resisting qualities. The high chromium steels, containing from 9 to 16 per cent chromium are the so-called "stainless steels." They resist corrosion and high-temperature oxidation, and possess in a high degree the properties of hardness, toughness, strength and ductility, the degree in which each of these qualities is present depending upon the tempering temperatures employed. These steels have the disadvantage of poor machining qualities, but these can be improved by the addition of sulphur or selenium. Rustless steels which have good machining qualities are usually composed of approximately .1 per cent carbon, 18 per cent chromium, 8 per cent nickel and .3 per cent sulphur or selenium.

As in this last-named steel, chromium is very largely used in conjunction with some other alloying element. The chrome-nickel steels, containing from 1 to 3.75 per cent nickel and from .45 to 1.75 per cent chromium may be heat treated to give ultimate strengths in tension of 250,000 lbs. per square inch, combined with very great hardness and fair toughness and ductility. By using higher tempering temperatures, very considerable strength can be combined with great toughness and ductility. The physical properties of any given chrome-nickel steel will depend upon its heat treatment, and the carbon and manganese content, as well as upon the quantities of nickel and chromium present. Speaking in a general way, however, the higher the percentage of nickel and chromium present, within the limits specified above, the stronger the steel will be, and this additional strength is obtained without material loss of ductility.

The chromium-vanadium steels also possess in high degree the qualities of strength and toughness. The addition of a small amount of vanadium, usually from .15 to .25 per cent, gives the steel fatigue-resisting properties, that is, the ability to resist repeated and rapidly changing loads. For this reason, steels of this type are largely used for springs, gears, crank shafts, connecting rods and other similar components subjected to rapidly changing loads.

Chromium-molybdenum steels, or "chrome-molly" as they are popularly termed, are strong and tough, and weld well. These steels are widely used in the manufacture of fuselage tubing where great strength is required, and for other highly-stressed components of the airframe. Where such steels have been heat treated to give a high degree of tensile strength,

however, it should be remembered that the welding process will reduce the strength of the metal near the weld and that subsequent heat treatment will therefore become necessary to restore the original strength.

4. TUNGSTEN. The addition of tungsten to steel imparts the property of heat-resistance and enables the steel to retain magnetism. Tungsten steel is also hard and tough. Its principal applications are to the manufacture of permanent magnets, armor plate and armor-piercing projectiles. High speed metal cutting tool steel also contains tungsten, usually in conjunction with chromium or vanadium, or both. Tools made of such steel will, after suitable heat treatment, retain their cutting edge at dull red heat.

**Conclusion**

Space does not permit of a fuller discussion of steels and their heat treatment than that given above. Whole text-books have been written on this subject, and all that this article professes to do is to touch upon some of its more important aspects. Enough may have

been said, however, to indicate the extent to which various methods of heating and cooling, and the introduction of various alloying elements, affect the qualities and physical properties of steel.

The appended table will emphasize these points. This table gives the principal physical properties of several steels, and shows the effects of variations of tempering temperatures on each. It also indicates the effects of the alloying elements upon these physical properties and gives the approximate chemical composition and recommended heat treatment of each steel.

The Brinell Hardness Number is an index of the hardness of the steel. The higher this number the harder is the steel. Commercial steels range, in respect to hardness number, from around 150 (very soft) to 450 (very hard).

The chemical symbols giving the composition of these steels are as follows: C., Carbon; Mn., Manganese; Ni., Nickel; Cr., Chromium; Mo., Molybdenum.

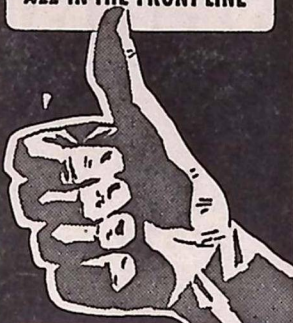
STEEL	TREATMENT HEAT	Ultimate Strength (Tension) Lbs./Sq. In.	Elongation (Per Cent)	Brinell Hardness No.*
Medium Carbon C. .35%; Mn. .75%	Quench in water at 1550 deg. F. and temper at 800 deg.	105,000	24	212
As above.	As above, but temper at 1300 deg. F.	85,000	34	174
Medium Carbon C. .45%; Mn. .75%	Quench in water at 1500 deg. F. and temper at 800 deg.	121,000	16	248
As above.	As above, but temper at 1300 deg. F.	97,000	27	197
Nickel C. .4%; Mn. .75%, Ni. 3.5%	Normalize at 1670 deg. F. Quench in oil at 1450. Temper at 800.	165,000	14	331
As above.	As above, but temper at 1300 deg.	94,000	27	183
Nickel-Chromium C. .3%; Mn. .65%, Ni. 1.25%; Cr. .6%	Normalize at 1700 deg. F. Quench in water at 1525. Temper at 800.	167,000	10	311
As above.	As above, but temper at 1300 deg.	93,000	28	187
Nickel-Chromium C. .5%; Mn. .45%; Ni. 1.75%; Cr. 1.1%	Normalize at 1650 deg. F. Quench in oil at 1450. Temper at 800.	225,000	12	415
As above.	As above, but temper at 1300 deg.	118,000	21	241
Chrome-Molybdenum C. .4%; Mn. .75%; Cr. 1%; Mo. .2%	Normalize at 1700 deg. F. Quench in oil at 1575. Temper at 800.	180,000	10	363
As above.	As above, but temper at 1300 deg.	110,000	21	223

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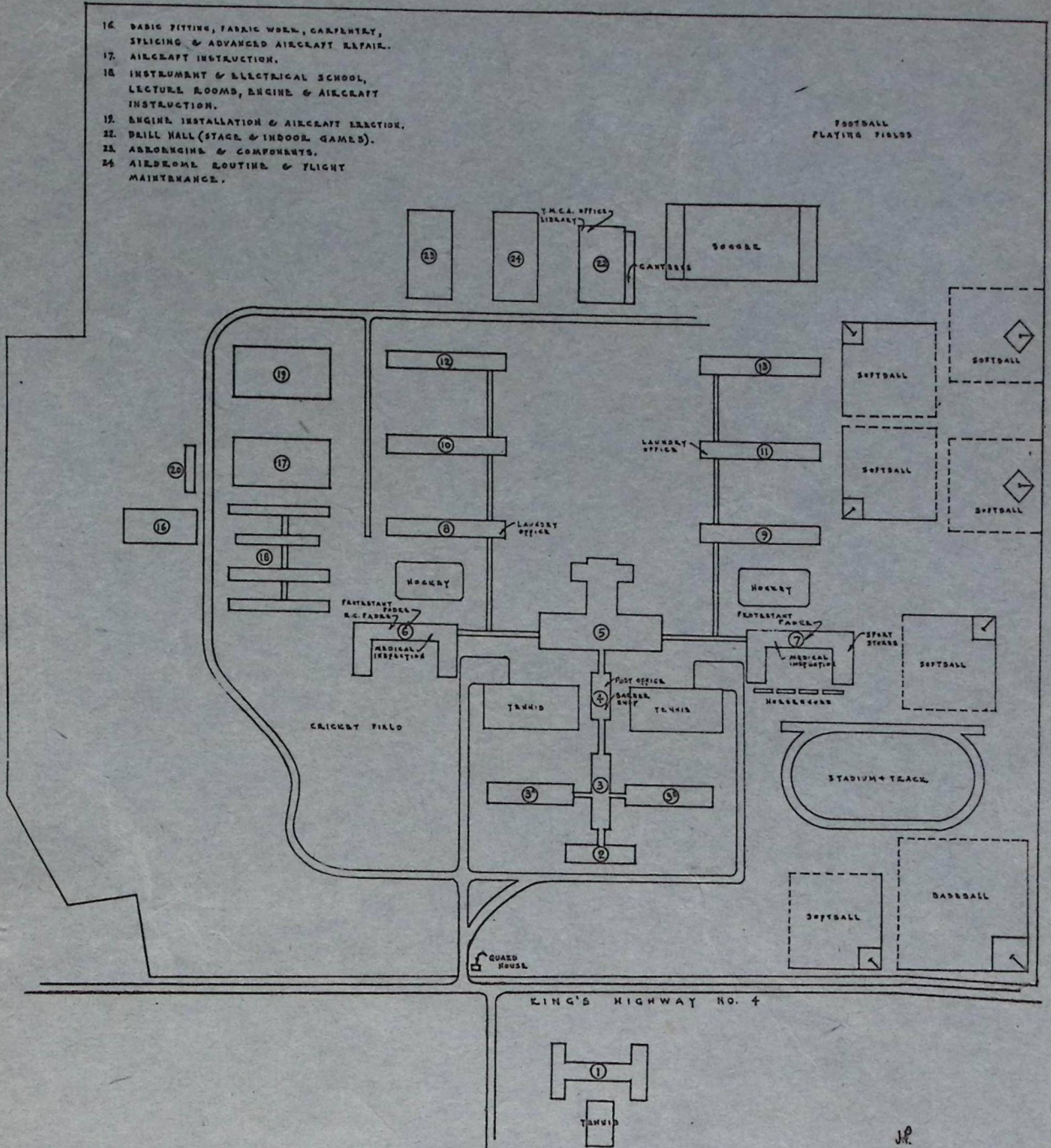
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