

TEE EMM



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*Pilot Officer Prune says—
"Take Tee Emm regularly!
Prevents that Thinking
feeling!"*

NOTE THIS

On page 261 you will see the first of a new series we are running in TEE EMM by way of lightening our pages and also to act as a breather for you all between the gulps of gen. We have, in short, asked several well-known Newspaper Cartoonists to illustrate in their own way a few Service terms. We have just left it to them: we can only hope they get them right and keep them clean!



I hope that these Training Memoranda will be widely read and studied, since I am certain that they will help us all to improve our efficiency, not only in our training but also in operations against the enemy.

Air Chief Marshal Chief of the Air Staff.

THE ART OF INSTRUCTING

I

INSTRUCTORS, like Gremlins, are of many different types—each distinguished by his own particular style and method of instructing. But all of them fall, broadly speaking, into two main classes—good and bad. A good Instructor is one who puts the gen across so that it sticks in the pupil's mind. A bad Instructor is one who fails to put his stuff over and who is therefore more or less wasting his own and his pupil's time. For the basic definition of an Instructor is someone who imparts information ; the imparting of it is done with a definite purpose ; and that purpose is that it shall be retained in the mind of someone else.

It has been said that good Instructors are born, not made. This is so much rubbish—apart from being disheartening. The perfect Instructor may be born, but the birth-rate has fallen so much that the percentage of perfect Instructors—present company excepted, of course—is practically negligible.

As we have said, the types of Instructor are various, but from experience we like to place them in four main categories.

First, there is the timid and apologetic type. You know the sort, "I'm sorry,

chaps, you'll find this is an awful bind." Or, "You probably think this is a lot of bull, but it's in the syllabus and I've got to push it out." This type generally has the saving grace of being approachable and sympathetic towards his class; which is very essential for a good Instructor.

Secondly, there is the aggressive type. He has the barrack-square manner. What he says *goes*, sort of thing, and he brooks no contradiction or question. Yet these are very necessary to ensure complete understanding by the pupil.

Thirdly, the superior type. His chief aim so often is merely to impress with his superior knowledge. To instruct is an act of condescension on his part. Sometimes he is so bent on imparting information which only he knows, that he gets over some pretty duff gen. Beware of the superior type.

Lastly, the comedian type. He is always full of fun and games, and rather overdoes it so that the work in hand suffers. A sense of humour is a valuable asset in an Instructor—it need not always be of the low sort—and a little joke is often useful to keep up the interest or to illustrate a point.

Now the good Instructor should have a dash of each of the above types in his make-up. He should have sympathy, yet should be sufficiently aggressive to maintain good class discipline. He should have a sound knowledge of his subject, yet should put it over with a leavening of humour.

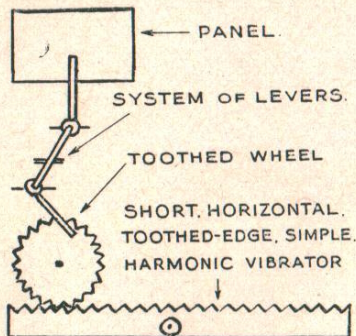
Instructing at the best of times, though so vital a job, is a most thankless one. Be as good as you like, and still you'll seldom get praised: be bad and you very soon hear about it. But it *is* an art and, like all artful things, is full of tricks. Learn the tricks of the trade, and apply them; and it is amazing how good you can become. The first point to appreciate is that instructing is a psychological process—transferring facts from one brain to many others—so that a study of the individual will greatly help in putting it over. No pupil is exactly like another; in fact, their types are as varied as the Instructors'. Still, it is useful to try and classify them and treat them accordingly. Here are a few easily recognised ones:

First there is the backbone of every class, the "Solid worker" with a critical mind. Nourish him and answer his questions very thoroughly. Then there is the definite "Dim-wit." Don't ignore him or hold him up to ridicule; rather try to make him appear intelligent, and so give him confidence. Thirdly we have the very annoying type, the "Know-all." It may be necessary to shoot him down in flames as soon as recognised: sarcasm is a very dangerous weapon, but a short burst here may be useful. Again, practically every class will have its confirmed (and somnolent) "Back-bencher." Move him to the front and give him no rest. Beware, too, of the "Side-tracker," a subtle but easily recognisable type. Be strong-willed with him and continue on your straight and level course. There are many other types which you, with experience, will easily get to know. What we want you to realise is that every class is made up of different individuals who are not nearly as standardised as the uniforms they wear.

Remember also that most of the pupils these days are comparatively new to the Service, their period of training is of necessity reduced to a minimum, and they

haven't time to learn a new language, *i.e.*, "Manualese." Translate the manual for them into simple English. It is all right to be able to recite the manual parrot-fashion for passing examinations, but the pupil must *understand* things to be able to use them intelligently later on. Some manuals, by using their particular phraseology, have the unhappy knack of making delightfully simple things absurdly difficult. The following description of a simple mechanism as it might be given in a Manual for Sanitary Engineers, shows you what we mean.

DESCRIPTION OF WORKING OF MECHANISM



The working of the mechanism may be briefly explained as follows :—

When the Short Horizontal Toothed-Edge Simple Harmonic Vibrator, shown in Fig. 1, is moved in azimuth to the right the teeth of the Short Horizontal Toothed-Edge Simple Harmonic Vibrator engage with the teeth of the small Toothed Wheel. This engagement causes the small Toothed Wheel to rotate in a clockwise direction and so actuate a System of Levers which causes the Panel to be elevated in a vertical plane. The reverse side of the Panel being only visible, through a slot, as to the top half, this upward movement causes the lower half of the Panel to come into alignment with the slot and take the place of the top half, this presenting to the anxious enquirer the legend shown thus: VACANT Similarly, when the Short Horizontal Toothed-Edge Simple Harmonic Vibrator is moved in azimuth to the left the teeth of the Short Horizontal Toothed-Edge Simple Harmonic Vibrator engage with the teeth of the small Toothed Wheel causing it to rotate in an anti-clockwise direction and so actuating the System of Levers that they cause the Panel to be depressed in a vertical plane. The reverse side of the Panel will then appear as thus: ENGAGED

This sort of thing sounds very impressive sometimes when put over, but it often leaves a pupil quite cold because he doesn't understand it. The Instructor is not there merely to impress but to give understanding. This rather reminds us of the man who could never bring himself to say

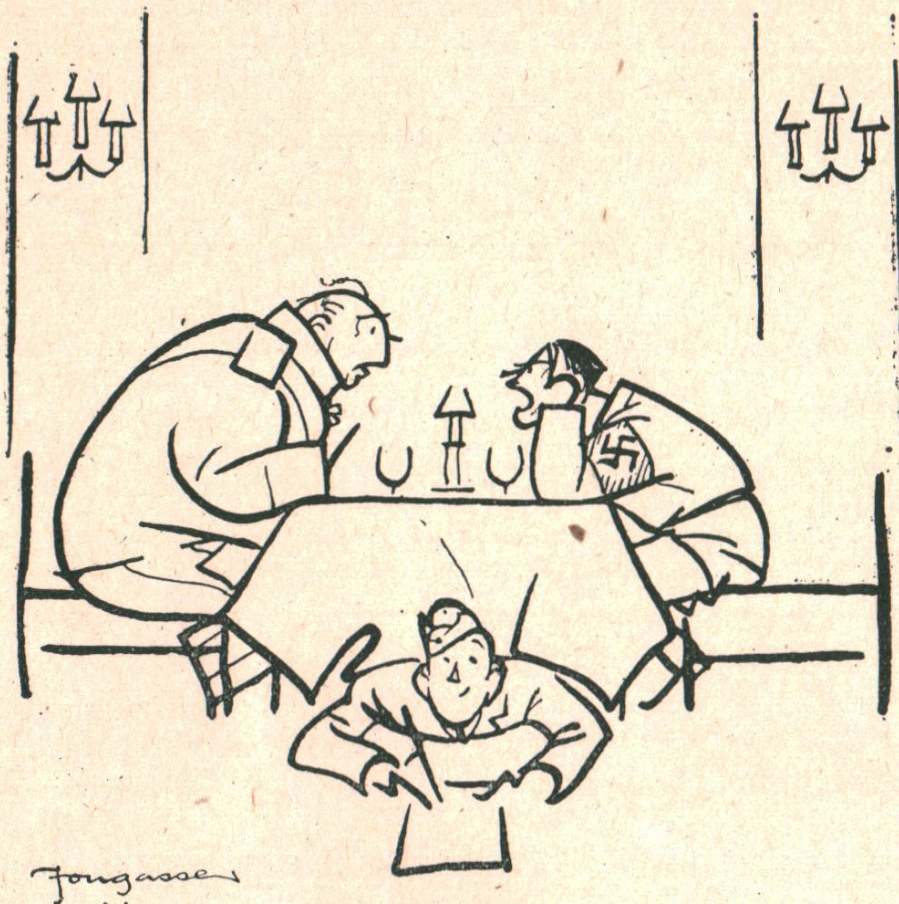
Twinkle, twinkle, little star,
How I wonder what you are,
Up above the world so high,
Like a diamond in the sky!

He preferred to say

Scintillate, scintillate, constellation vivific,
Fain would I fathom thy nature specific,
Loftily poised in the ether capacious,
Strongly resembling the gem carbonaceous!

Avoid this impressive technical language at all costs and be as simple as you please—and as you can.

WHAT THE HUN IS DOING



“Two Mosquitos flying in company some distance apart, sighted a fair number of F.W.190's two miles ahead of our aircraft and 4,000 feet above. The enemy aircraft attacked from above, climbing away. The first attack was made from astern, the second from *port ahead*, the third from port bow, and the fourth from starboard bow. The enemy aircraft manoeuvred for further attacks from astern, but were unable to obtain good attacking position due to the speed and evasive action of our aircraft. The attack lasted for approximately five minutes, and bullets were soon hitting the water

astern.” Note from the foregoing that the enemy aircraft made the second attack from port ahead. This is the first time that Mosquito aircraft have been attacked from this angle. After making such an attack it would appear that the enemy aircraft had not sufficient speed to get into position to make a successful second attack. The evasive action taken in order to shake off this number of F.W.190's must have been of a very high standard, and the crew of the Mosquito is to be congratulated inasmuch as the pilot must have taken evasive action by following very carefully the position of the attacks as given by his observer.

Recently a Lancaster returning from an operation went down to investigate what was thought to be a dinghy or a small boat. Some lights were seen near it, and shortly afterwards the Lancaster was attacked by a Ju.88. This may or may not have been a form of decoy, *but*—there have been similar occurrences previously.

Fighter pilots from Malta have observed new German wing markings of a slim black cross on a white background surrounded by a black circle. At a distance this marking, “gives the appearance of Italian or friendly roundels and is probably designed to deceive our ground defences.” By the way, we like the implication here: our ground defences obviously consider Italian aircraft to be no more dangerous than friendly ones! and probably less dangerous if the friendly one is P.O. Prune!

PUT YOURSELF IN THE OTHER FELLOW'S PLACE

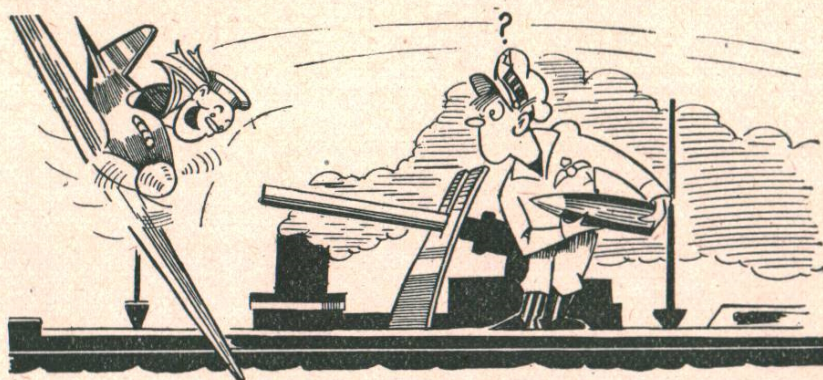
Putting yourself in the other fellow's place is always difficult. Our own place is so much more important to us than his. Why should we bother about *his* point of view?

Yet he has one; and it is just as important to him. And funnily enough you may find that it is even more important than yours, if you do put yourself in his place. Haven't you, for instance, ever been on a long country walk and been getting more and more furious with those ruddy cars—we're talking pre-war stuff, of course!—which come up behind you, hooting in your ear, crowding you into the ditch, covering you with mud, *owning* the whole blinking road? And then when you've found you've misjudged the length of your walk and are getting fed up with it, a kindly car offers you a welcome lift. Haven't you even then got more and more furious with those ruddy pedestrians, never looking round, walking all over the place, making you pull out to your wrong side, *owning* the whole blinking road?

Yes, you have. So have we. And when we're on a cycle (which has to be seen to be believed!) we curse both pedestrians *and* cars! . . .

In other words, it is difficult and quite contrary to human nature, to put yourself in the other fellow's place.

We want you now to translate pedestrians and motor cars into Air Force and Merchant Navy. Do you, when in an



aircraft flying past a convoy or a single ship, put yourself in the place of the fellows on board? If not you should. And then you wouldn't do anything that you're not supposed to do, such as beating them up for the fun of it, or flying low directly overhead, when there's no real necessity but just because it's easier for you. You wouldn't do it because you'd realise the extra strain and extra worry which that sort of thing imposes on men already under strain, men who have probably been bombed before by hostile aircraft, men who are bringing you your food and sinews of war. You wouldn't do it, in short, because you'd realise those other fellows' point of view.

Let's have a closer look at that point of view in the following extracts from interviews.

"Capt. P— of the S.S. *M*— said his ship was approached by an aircraft, which circled round at a height 'if not that of the mast, certainly less than 500 feet.' The aircraft skimmed right over the ship. Captain P— is most indignant at this needless low flying—'it puts the wind up us unnecessarily.'"

"Capt. J— of the S.S. *G*— said 'We frequently see A/C round about the Isle of Man. They fly

directly over the ship, at times at 1,000 feet. It makes us feel rotten, as we naturally suspect them to be Jerries'."

"Chief Officer M—— of the S.S. B—— said that aircraft coming from inland, in the vicinity of the Copeland Light, frequently fly over ships well within the range of Oerlikons'."

"Chief Officer R—— of the S.S. A—— stated that when in the Irish Sea, a number of Whitleys passed, going North, and quite out of attacking range. Then shortly afterwards, one *solitary* plane came along and passed directly overhead at a height of 500 feet. 'We naturally supposed,' commented Mr. R——, 'that he was a member of the other crowd of Whitleys, but we could not be *sure*'."

"Capt. S—— of the M.V. Q—— said: 'About six weeks ago Q—— was proceeding from Manchester to Belfast, when a Spitfire type approached at mast height, and circled two or three times.' Capt. S—— gave orders 'to mark his tail and shoot.' Twenty rounds were fired by the ship's Oerlikon, and the plane—which was

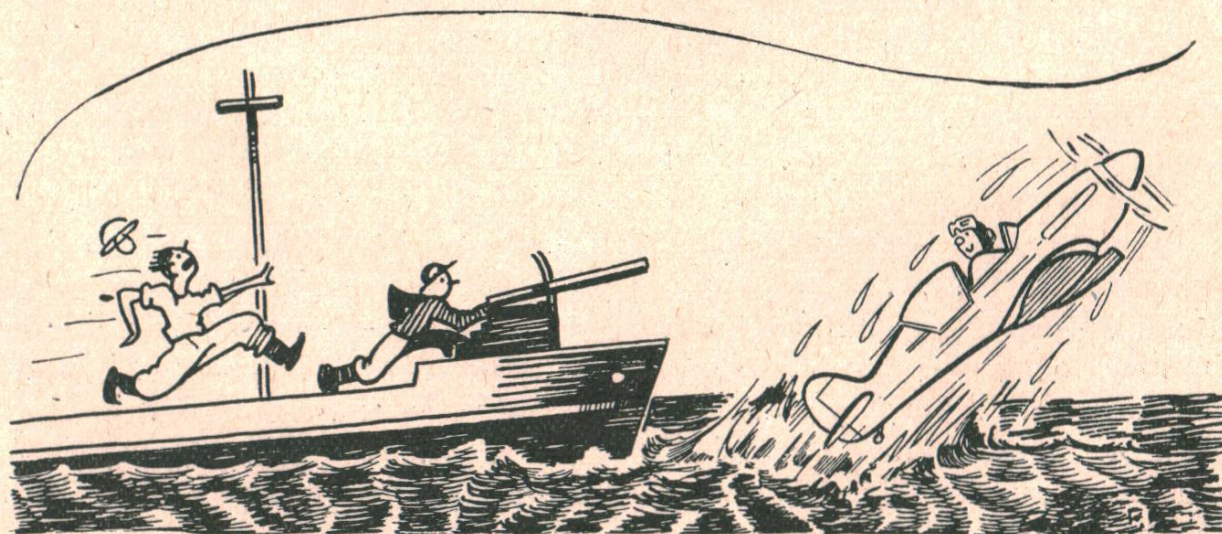
200 or 300 feet away—was scared off. Visibility was good at the time."

Well, there you are! There's what the other chap thinks. Do try to bear it in mind when next your duties bring you near our ships.

We quite realise, of course, that the Air Force has a point of view, too—difficulty of recognition and so on—but this isn't the place to air it. If the Merchant Navy had a TEE EMM ("Oh, you lucky people!") we'd write *your* point of view up for *them*.

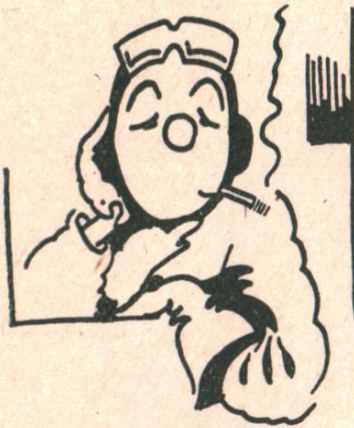
But there's one little thing to remember—possibly in their favour. There's an Admiralty Order which says they may fire at any aircraft coming within 1,500 yards which hasn't been recognised as friendly. And the onus is not all on them to recognise you without help. Yet if they *had* all kept strictly to that order, as they're entitled to do, there might have been more pilots and air crews in the drink.

Rather a drastic way, of course, of realising the other chap's point of view, and we hope it won't come to that! It won't if you really do try to *Put Yourself In The Other Fellow's Place*.



"Don't Shoot! That can only be P.O. Prune!"

FLAK AND THE BOMB AIMER



Prune thinks it pansy to take evasive action.

As a bomb aimer, you will probably say that flak isn't your problem at all. Like the black-out, rationing, or poor quality beer, you just have to put up with it. But it is your job to run the aircraft over the aiming point, and unless you know where you are every minute while you are in the target area, you haven't a chance of doing it properly. And if you leave evasive action in the pilot's hands, you won't be able to map-read at all. One of the most important factors of map reading is keeping in close touch with the varying course of the aircraft. And this touch is likely to be anything but close if all the time your pilot is making erratic turns in a haphazard attempt to avoid the flak.

Summing up—to map-read in the target area, you must know how to direct the aircraft so that the flak can be avoided, and yet keep in your mind your exact position in relation to the aiming point. Sounds rather impossible—but there *is* a solution.

As far as you, the bomb aimer, are concerned, there are two kinds of flak—the barrage and the predicted. Nothing can be done about the barrage variety; you can be hit by that, even if your pilot is doing a loop. But the solution to the predicted is 90 degree turns. These turns must be made every

thirty seconds or less, and be at least rate two. If you give the alterations properly, you can cause the aircraft to pass over a pin point almost every time it flattens out. The predicted flak, of course, will burst on the continuation of your original course.

After becoming experienced, you will be able to judge approximately the positions and numbers of the guns, and make your turns with regard to their flashes on the ground; but for an inexperienced chap the best system is that of planned, rate two turns, not more than thirty seconds apart; and it should be carefully mapped out in the pre-flight plan. If you use this method of approaching the target area, as well as the aiming point, you should not only fox the predicted flak, but be able to map-read accurately every second. And if you're good enough at it, you can expect Jerry to pick on an easier prey—at least, you fervently hope so!

Another successful method of approaching the target has been found to be as follows: approach at right angles to the bombing run, turn sharply on to the run, and turn off again after the bombs have been released.

One very important point to remember about all the above is that every 90 degree turn takes an appreciable distance to turn in, maybe as much as a mile or more. If you forget this, your map reading, which should have brought you on to the aiming point, will be a dead loss.

When the target is really hot—and you know only too well how hot some of them can be!—the gen is to run to

any point about a mile from the aiming point, turn on it (at least 90 degrees) and run over the aiming point that way. You will then be able to bomb as soon as the aircraft flattens out—and you have a good chance of being able to

remain flat and level for your photograph.

All in all, the flak problem is very simple—providing you don't get hit. Which we hope you won't. Try all the above out—and good luck!



NO. 7. COMPASS DEVIATION CARDS

Modern aircraft, especially those carrying cannon, show bigger and bigger compass deviations. This has meant that the deviation cards have to be bigger if the deviation is still to be legible within one degree. A new card, therefore, for both pilots and navigators, has been introduced, and is to replace the old Forms 316 and 316A, in all types of aircraft.

The new form, which is somewhat bigger than the old one, has one good dodge which may help you to avoid mistakes. Previously, when the signs were used in the conventional manner, the pilot or navigator almost invariably had to add when the sign was minus and subtract when the sign was plus because on the majority of occasions the course to steer was required from the magnetic course. But such an arrangement definitely increased the possibility of mistakes, and a mistake in the sign doubled the error. In the new form the use of signs has been deliberately avoided; the word "add" is used in the segment where the deviation is minus, and the word "subtract" in the segment where the deviation is plus.

The new card is being given a Perspex holder, and in aircraft fitted both with a D.R. compass and magnetic compass, the cards for each compass can be placed back to back in the holder and the deviations of each compass thus clearly seen.

There's an A.M.O. just out about it, by the way, (A.1311/42), which gives in the appendix a specimen card duly filled in. The card is signed as if by one "P. PRUNE," but pay no attention to this. It's obviously a forgery. For not only is the handwriting *not* Prune's, but the card is filled in *absolutely correctly*!

A RACE TO THE RESCUE

THE following story describes a rescue that went off perfectly—because the *navigation was sound*.

I was a member of that maid-of-all-work, that Cinderella of the Service, Coastal Command—or, more particularly—of one of its long-range U-Boat hunting squadrons. . . .

Day after day, week after week, month after month, nine long hours at a stretch the Whitleys would set off, in all weathers, on an anti-submarine sweep down into the Bay of Biscay, looking for something that seldom came.

On October 24th, 1941, we were some four hours out, down in the Bay. The weather was glorious and the scene one of unparalleled beauty (if you haven't seen it before), but I was hunched up over my radio, reading a book and trying hard to keep myself awake, when suddenly I heard the galvanising tones of an S.O.S., and, moreover, from one of our own aircraft, some hundred miles distant. His starboard engine had failed and he was in danger of coming down into the sea. Base acknowledged him and he immediately changed to MF/DF and sent his position, course, speed and height. I, too, changed to the D/F frequency and called up my friend in the other aircraft to tell him we were on our way to his aid. The story of that wireless operator's splendid conduct is old history in the squadron, but suffice it to say that he kept up a perfect running commentary on events, in addition to obtaining a string of excellent "fixes." Every time he transmitted I took a series of loop bearings on him and so managed to

"home" until eventually he signalled that they were unable to maintain height, strapped down his key and then—silence. Both operators of some experience, during this time we had maintained so close a co-operation that I got the impression that I had only to lean out of the window to be able to shake him by the hand, and, if this was comforting to me it must have been doubly so to him and his crew. Due solely to his excellent "fixes" and, to some extent, my loop bearings, it was only just over an hour before we sighted our friends in their dinghy, a good example of one aircraft successfully homing on another. We flew low over the dinghy and dropped our own rations to them and then signalled that we were off to find a ship to pick them up. They waved us good-bye nonchalantly, and off we went. Commenting later on their lack of enthusiasm, they said: "Oh, well, we *knew* you were coming!!!!" Then began some of the finest navigation I have ever seen. Systematically, our Observer carried out a complete search of the whole area and after half an hour we were gratified to see a large ship, later identified as one laden with R.N.Z.A.F. personnel, *en route* for England. Subsequently we learnt that the whole ship was plastered with notices warning of the danger of enemy aircraft, and that the Anzacs, feeling that they were nearing the war at last, keen as mustard, insisted on manning every available gun, and were with difficulty dissuaded from shooting us down under the odd impression that we were a Dornier Flying Pencil. Fortunately we had learnt from experience the touchiness of seafaring folk and

kept well out of range. Circling round, we passed our message by Aldis, requesting them to follow us on a certain course, and then set off back to the dinghy.

Eight times, like a great mechanical sheepdog we flew back and forth coming over that minute speck in the mighty ocean dead on E.T.A.—no mean achievement. Once on our return to the dinghy we found another Whitley on the scene—our Wing Commander's aircraft—and he was busily "homing" a destroyer by radio to the spot. From then on it became a race as to which ship would get there first, and naturally, as we had been first on the scene, we were staking our hopes on the Anzac ship; if it had been practicable to give her a tow we would have done that, too!

But about this time a race of quite a different nature developed—a race against time—for dusk was falling fast, and that dinghy, so very, very small even from 1,000 feet would be invisible from a ship's bridge in the dark. Once again we went back to the M.V. and she still had 17 miles to go; moreover, even our 10½-hour endurance was about through and it was imperative that we leave immediately lest we, too, should join our pals in the "drink." Then, faced with defeat after all our efforts, we hit on the idea of blazing a trail for the vessel to follow, a gigantic game of hare and

hounds—so, for the last time we set course for the dinghy and, as we went, threw overboard every one of our many pyrotechnics till, looking back from the rear turret, I could see in the gathering gloom a continuous stream of smoke floats, flame floats, flares, aluminium sea-markers, and even tin cans. As we waved good-bye for the last time and set course for home I took a last look at the Anzac ship, about twelve miles away, steaming like the clappers of hell—hot on the trail!!

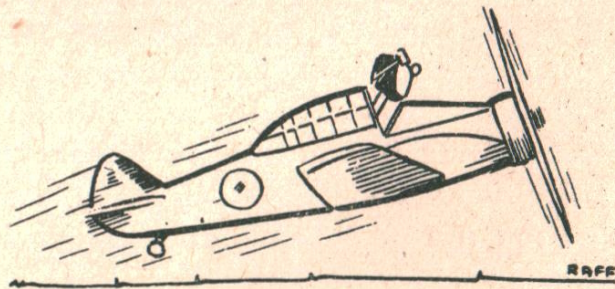
Back in the Mess we were on tenter-hooks to know who had won and when eventually we learnt that, much to our Wing Commander's chagrin, the destroyer had only arrived just as the last man had been taken aboard our ship, well, we felt that another pint was justified.

Talking to the "dinghyites" later we were amused to learn that, confident of their rescue, they had opened up the flask of rum in the emergency ration. The second pilot had some difficulty in boarding the ship when she hove alongside; he managed it eventually, but not before he had pulled two sailors overboard. On deck, the ship's crew, seeing him in an obviously "exhausted and delirious" condition, straight away bundled him below and stuffed him with brandy!

He is now convinced that Dinghy Hours are a Good Thing and to be encouraged.

LINES FROM PRUNE'S SHOOTING GALLERY

I never pull the stick back when flying low, in case my tail wheel hits the ground.



ON KEEPING AWAKE

THERE are some people who are just not interested in this subject. They consider any time spent in keeping awake as only the interval which must elapse before they can get to sleep again. If you are one of this type, don't bother to read any further as this stuff will be no use to you. You can quietly go off to sleep again—if you're not asleep already.

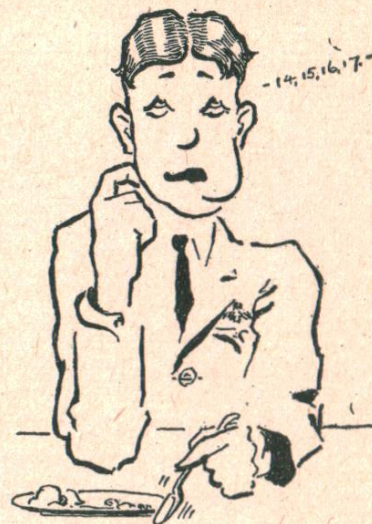
But there is a section of the community whose only job for most of the time they are on duty is to keep awake in case they have to do something suddenly to keep alive—like Air Gunners, or Pilots stooging happily along with George at the wheel. We believe these fellows really want to keep awake and that some of them occasionally find it difficult. So we offer them the following suggestions.

First of all, make up your mind you *will* keep awake. Quite frequently a rear gunner comes back with a story something like this: "I thought we had only another half an hour to go so I sat back and went to sleep. After about an hour I called up on the intercom. and the pilot replied we were just reaching the English coast. Cheese, it shook me!" Not so much, we think, as an intruder would have done.

Now about the meal you eat before you take off. Everyone complains about the food everywhere so, of course, you will not be satisfied with your operational supper, but believe us, a lot of care has been given to the matter on Stations, and most suppers, *provided you do not eat too much*, are adequate for your requirements. Of course, if you gorge on suet puddings and baked potatoes and a couple of

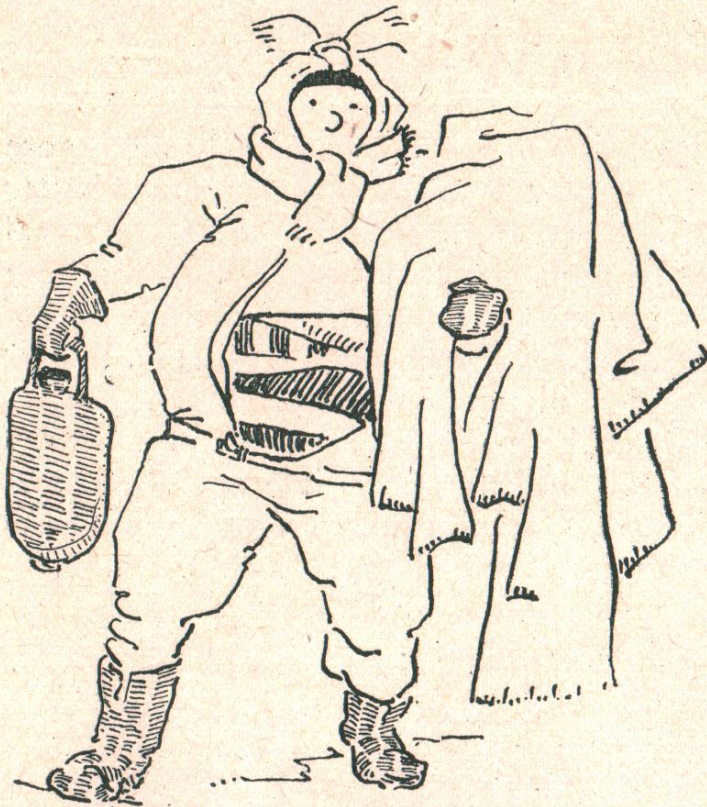
platefuls of greens you'll feel much more comfortable and will sleep much better in your turret, but if you limit your meal to a moderate helping of soup, meat and veg., and sweet and have only one cup of tea, you will feel much fresher in the air and will remain awake much longer. Even the maligned sausage and mash is a good meal if you eat it properly, that is, slowly. (One can't be too cautious with sausages these days, says P.O. Prune.)

Once in the air don't immediately start on your rations. Wait until you are hungry, which should not be for at least three hours after take-off, and then eat slowly and sparingly. It sounds a Spartan regime, but then you are not on a pleasure trip.



And "slowly" means thirty-two bites to each mouthful!

About oxygen and your clothing you should know enough already. (Read TEE EMM for June, 1941, p. 15, if you don't know about Oxygen, and read TEE EMM for Sept., 1942, p. 140, if you don't know about clothing.) Taking oxygen in accordance with the regulations is one of the most potent aids to keeping awake, and any airman who is negligent about his oxygen deserves anything he gets. Unfortunately the rest of the crew often suffers as well, which is a "bad thing." Similarly, see that you wear



Clothing is important for keeping warm.

the clothing recommended. You won't be too warm for efficiency, and cold makes you both sleepy and prevents your mind as well as your limbs from acting at the speed they should.

The medical section can help you a lot, but only if you give your best as well. Caffeine will certainly help to keep you awake and is best taken when you are nearing the target on the average trip of five to six hours. Everyone keeps awake on the way out, but once the excitement is passed the reaction sets in and it is then that caffeine can help you.

It starts to act about half an hour after taking it, and its effects last for about four hours. So it is wasted if you take it at the beginning of the trip and it may keep you awake in bed if you take it towards the end. You are not advised to take any of the other drugs which are said to keep you awake, such as Benzedrine.

The only remaining aids are ones you can give yourself, namely keep fit by plenty of exercise and not more than a "moderate excess" of vices. Get to bed at reasonable times normally; following an Op. do turn in as soon as you can after interrogation. Don't waste precious hours hanging about waiting to see photographs, which will still be there next morning.

It all really boils down to self-discipline, and we consider it preferable to put up with this inconvenience and live to see a glorious "second tour" rather than to terminate a glorious undisciplined first one half through. Of course, you may have different opinions on the matter, but we somehow feel the rest of your crew will be on our side.



"I say, does my pet pink elephant come under the heading of 'moderate excess'?"



Service Terms Illustrated

by

Well-known Newspaper Cartoonists

No. 1. WYNDHAM ROBINSON of *The Star*



PATHFINDERS



SNOW

“ The North Wind doth blow,
 And we shall have snow,
 And what will poor Spitfire do then, poor thing ?
 Completely earth-bound,
 She'll sit on the ground,
 Till somebody's Snow-plan gets cracking, poor thing ! ”

Traditional (or very nearly).

SNOW depends on how you see it. At Christmas in front of a crackling fire it is a jolly sort of element to think about. But alone on a steep mountain slope while an avalanche tears past, there is a sort of massive awe about it, which pretty well scares the pants off you. Snow-consciousness is largely fear plus respect, and if you wish successfully to remove snow from the runways of an aerodrome, you'll be wise to remember this.

If you tried to clear the three runways of your airfield all by yourself with a spade after a foot of snow had fallen, it would take you something like five years, not including privilege leave. One and a

half million cubic feet of snow want a little imagining, and need hard work and sound detailed planning if you are to shift it in a few hours.

The present R.A.F. Snow-plan for clearing airfields has been evolved as the result of much research, methodical computations, good hard thinking and a full year's field experience. If you are a clever engineer and forget that snow compresses, you can easily prove that the plan is quite impracticable ! But it can and does work very satisfactorily even under the most unfavourable conditions you're likely to get in the British Isles—if you start early enough.

The job of clearing snow from an airfield is no piece of cake, even under the best of circumstances. The first and most obvious reason is so elementary that it gets overlooked. Simply this: It doesn't snow when the sun is shining. The moment it does start you're almost blind even on the ground. In a snow-storm you can miss lights at incredibly short distances; many are the cases where a lost traveller has wandered within twenty yards of the safety of a house and not seen it, or a thirsty traveller has passed unwittingly by the welcoming lights of an inn. (This is a pre-war case, of course; the welcoming lights to-day, snow or snow, would bring the police and wardens along at the double!) Another reason is that snow—probably due to the Gremlins who organise unwanted snow—has a nasty habit of starting to fall at dusk, so that the added nightmare of blackout and darkness intensifies the blindness caused by the snow itself.

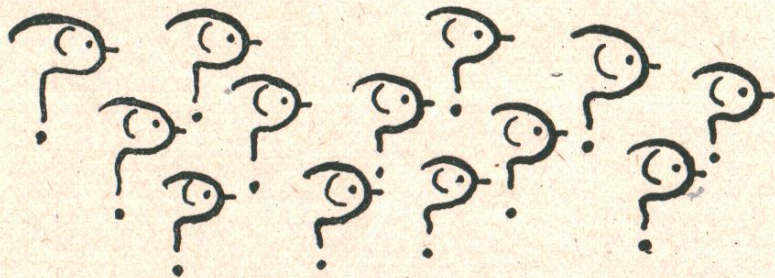
Even the most efficiently conceived Snow-plan can hardly expect to work successfully with less than seventy to a hundred men, many of whom must be at widely dispersed parts of the airfield. With no hope of seeing what the other fellow's doing, they can only do their work in a properly co-ordinated manner if they know it so thoroughly that isolated detachments can carry on without supervision. That's a hard enough job at any time, but with snow falling, a wind blowing, and the temperature round about 30° or below, it's a safe bet it cannot be done without practice and training. Therefore, to see that his men are practised and trained is the first job of whoever is responsible for the

Snow-plan on any Station. The next thing is to ensure that it's put into operation as soon as the fall starts. Snow rarely falls at more than one inch per hour in the British Isles, but even so, you must get cracking at once. Even with the wettest snow and lots of agricultural salt, once you let five inches fall the job of clearance is trebly hard, if not impossible, without Nature's help.

If you are a wishful-thinking Prune, you will, whenever the Met. issues a warning that snow is about to fall, always hope it won't be much. You will sit around vainly hoping that it won't start till next morning. Unfortunately, no man can accurately forecast the precise minute at which the first flake will fall; and it's no consolation to say you hoped it wouldn't fall till daylight if your airfield is u/s next morning with six or nine inches. And if the Hun then takes advantage of you, or you can't take advantage of him, it is no good blaming Met. Better far to have a few false alarms; for at least you can look on them as dress rehearsals, which will improve the efficiency of your team.

In other words, we repeat, those responsible for the Snow-plan must be sure at all times that their men are properly trained; and all concerned with its working must know their job and the layout of the airfield blindfold. So thoroughly must they know it that they can start on the dot, even in the dark, with equipment properly cared for.

Having thus got the business all buttoned up and under control, they can then watch with tranquil confidence, if not with joyous anticipation, the snow clouds gathering on the horizon.



TEE EMM'S Brains Trust

Tee Emm, being an official publication, everything in it appears with the approval of the Air Member for Training and represents official views on policy. This page, however, we reserve for occasional unofficial correspondence—criticism, comments, suggestions, queries, and so on—to which we have tried to dig out an official reply.

LETTER. "SIR:—I was astonished to read your article 'Map Reading from the Word Go' (December TEE EMM), for in the first paragraph you categorically deny the very fundamentals of map reading which we poor instructors have been endeavouring to put over to pupils for the last two years. It is difficult enough in all conscience to teach this subject, but when your recent statement gets into the hands of our pupils our lives will be absolute purgatory. We have been taught systematically to map read *from the map to the ground*; and that is a complete reversal of your statement. And as far as we are aware this is the accepted Air Ministry Policy. Although I think the rest of your article is excellent and generally useful I myself would feel happier if you would communicate the gist of this moan to the 'Navigation Narks' in the Air House in order to get a ruling. Many other P.B. Instructors share my views."

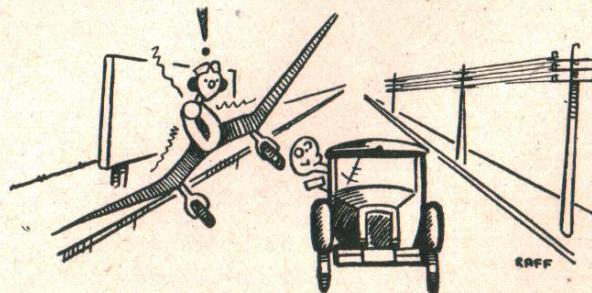
REPLY. We agree that our opening paragraph might be misunderstood. But when we said "it's not much use selecting a bit of map and trying to make it tally with the bit of ground beneath you," we were trying to say, in very general fashion, "it's not much use picking out a bit *at random* anywhere on your large map and trying to fit it in with the ground beneath you. You must have some definite idea of where you are." And this, of course, you have from your D.R. position. You *then* work from the map to the ground, which is the correct and accepted way, because it will prove to be the easiest way, and hence is in complete accordance with Air Ministry policy. It is not a bit of good searching all over the map for something vaguely seen on the ground—and already long past!

Readers of our subsequent article, "Map Reading Made Easy" (January, 1943), will see that the correct method, as stated above, is implicit throughout the article. The recognised procedure is to mark off the track lines with a time scale, thus helping the navigator, or pilot, to estimate the D.R. position quickly and accurately. He then knows exactly what to look for on the ground from a very limited area of map.

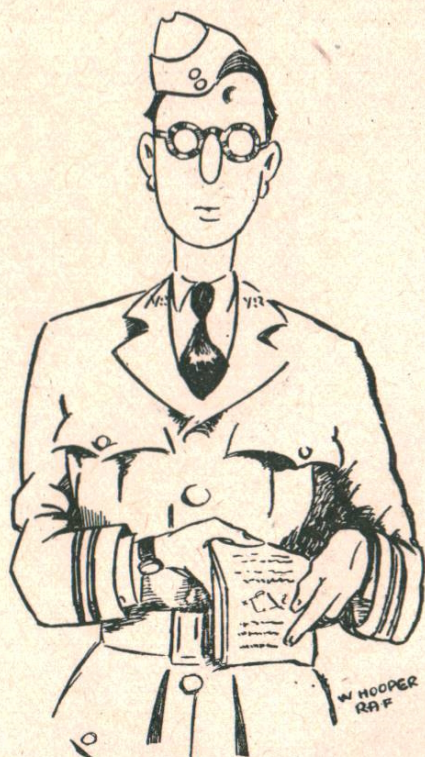
As our correspondent says, teaching blokes to map read is one of the hardest of the instructor's tasks. And, we reiterate again—in order to remove any lingering doubts from pupils'—and instructors'—minds, that the correct procedure is *from map to ground*.

LINES FROM PRUNE'S SHOOTING GALLERY

I was flying along the main road in a Maggie with a strong head wind—when an Austin 7 hooted and overtook me.



FROM FLIGHT LIEUTENANT HYE BROW



SIR,—Far be it from me to bother you once again, but it does cross my mind that one meets a lot of ignorant people in this Air Force—indeed, I have not yet, after twelve years in it, found anyone up to my own mental calibre. For instance while talking to several people yesterday—unaccountably they were all called away on business long before I had finished—I found that at least three of them had only the very vaguest of ideas what a rimless cartridge case was and why. As—I repeat—they all left before I finished, I crave the indulgence of your pages—in case any of them are reading it.

There are, you will have noticed, now that so many of our friends from over the water are with us, two types of ammunition case in general use. In the '303 Browning the case has a rim on it whereas in the 20 mm. Hispano there is no rim, but only a groove. That sort of case is called rimless and is new to the British Service.

Now, of course, the object of the rim is to pull out the cartridge case after it has been fired from the chamber and there is a little hook, the extractor, to do it. There is a similar type of gadget with the rimless, and naturally it's a different shape, but that isn't the whole story.

You will notice if you stooze around the armoury that if you put an unfired round of Hispano ammunition into a Hispano barrel it won't go right in. Probably you thought that the chamber was dirty—probably you were quite right—but at the same time even if it were clean you would still have found it would not go right in and, not being mentally bright like myself, you would have formed the impression that you had got hold of some dud ammunition.

Well, that is *not* the explanation. The rimless cartridges are deliberately made like this in order to get a gas seal round the "small cone" of the chamber. They stick out as you have noticed, and when the gun is fired, the breech block goes forward with a fairly heavy slam and "*crushes up*" the cartridge case. This makes a decent gas seal, so that you do not get a lot of gas back around the breech when you fire.

If you look at a fired rimless cartridge case you'll see it's different in shape from an unfired one, and that will explain to you what the effects of "crush up" are.

So now you know what "crush up" is, don't put in your Form 1022 things like "Oversize Cartridge Case" or "Collapsed or High Shoulder." Both are quite unlikely; and if you'll only do as I suggest and compare a fired and unfired round, you'll see that such remarks are silly.

If I've been able to expand in any way your limited knowledge, I am happy to have been of service. We can't all be born clever. So long.

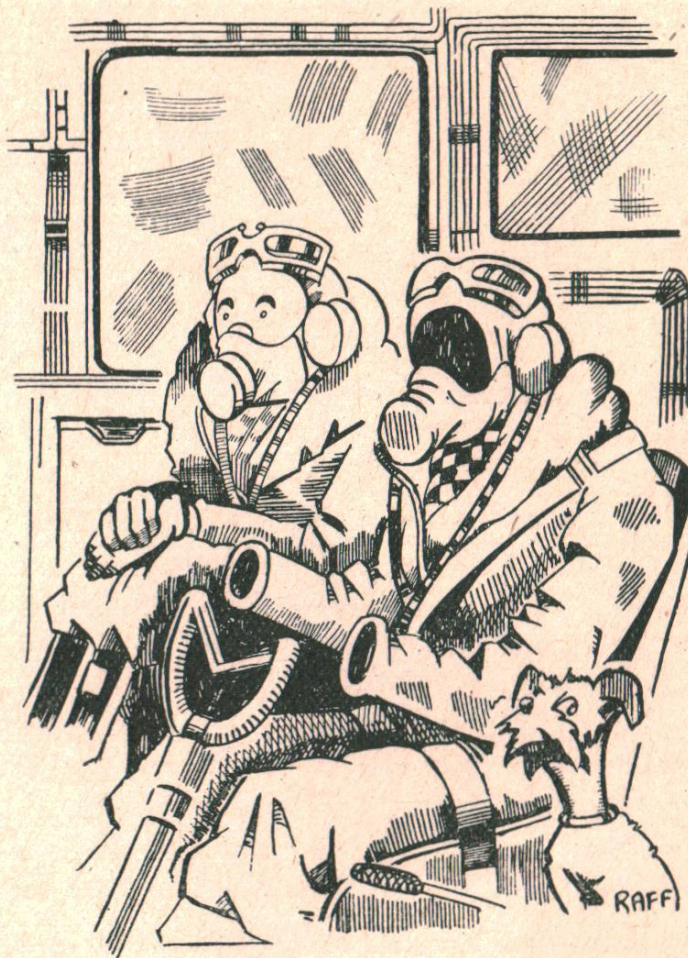
V. HYE BROW, F/Lt.

“GEORGE”

SOMEWHERE among the entrails of all operational heavy bombers and long range Coastal aircraft lives a small mechanical contrivance commonly known as “George.” “George” has the official and imposing name of “Automatic Control Mark IV,” but hardly anybody who is anybody calls him that.

Now Automatic Control is looked on in many different ways—depending, generally, on the experience of the fellow who’s doing the looking. The opinions, therefore, vary from “simply marvellous” to a haughty “no blinking box of tricks can fly this aircraft as well as *I* can.” But any experienced pilot will admit that when accurate straight flight is required, such as for astral navigation, automatic control is more accurate than the human pilot’s. Indeed, competitions organised between good sound experienced pilots and “George” have proved this only too well. We are told that those whose job it is to make more and better “Georges” simply love to see the expression on a pilot’s face when he returns with a lofty smile after one of these competitions and is then shown, first the charts recording the flight path of the aircraft with himself in charge, and then those with “George” in charge. The lofty smile disappears like whisky inside a Scotsman, as the pilot realises that “George” can do it better. And more important still, “George,” not having eyes and not being dependent on using them if he had, is just as accurate by night as by day.

Of course, one of the principal reasons for having aircraft automatically controlled in the first place was to stabilise



Let “George” do it.

them during bombing runs; but owing to changes in aircraft design and the fact that a large aircraft flying on a straight course at a constant air speed and at a medium height is the favourite fruit of A.A. Gunners, “George’s” main function is now that of “Pilot’s Assistant.”

This is really what “George” himself loves best, and he does it well. He will turn the aircraft at a slow rate—though he tends to climb or dive very slightly during a sustained turn. During straight flight he will cope in a masterly manner even with one engine out of action. On four-engined aircraft “George” will fly the aircraft very nicely with even

two engines dead—except when both engines on the same side have gone. Under these conditions it's very doubtful whether sufficient rudder can be applied to keep a straight course.

As regards reliability, results during the last war have shown that most of the bugs have been taken out of "George." Assuming he gets good maintenance, he won't freeze and will give long and reliable service. If anything does go wrong, remember to help your ground staff by noting the conditions at the time, *i.e.*, automatic control air pressure, the external air temperature, and so on; in short, give them as much helpful information as you can.

Now we could here tell you all about how to handle "George," but if we did you'd quite probably say "Oh, I know that," and not read it; or read it and

say, "Now I know that," and forget it. The best, and the only way, to find out all about "George" is first to look up the section about him in Pilot's Notes General. If you find any of it unintelligible or still have points you want made clear, go and ask your Engineering Officer. Then go up and try "George" out. It's not enough to be acquainted with him; you must get to know him really well.

Finally, remember that "George" isn't a new-fangled idea. He is a sound mechanical project which has been operating in aircraft with a great deal of success for some years. He does not worry about cloud bumps or dirty weather, and when you know him he can be a real friend. And anyone, as P.O. Prune says, who does my work for me, is a friend of *mine!*

OXYGEN DOES NOT BURN

THE following is an extract from the report of a pilot who escaped after a forced landing in neutral territory and after burning his aircraft: "I turned the oxygen on in the cockpit, and struck a match and applied it to the jet of oxygen. There was an explosion and the cockpit caught fire immediately."

But the explosion wasn't big enough to explode a very common fallacy—that oxygen is inflammable. Oxygen is *not* inflammable in air, but it is true that oxygen will cause burning substances to burn more violently. In the present instance, the only apparent effect of holding a lighted match to a jet of oxygen would be to cause the match to burn more quickly and more brilliantly. Certainly the oxygen would *not* burn, nor would there be any explosion from it.

It seems fairly clear in this case that after the crash the cockpit was soaked with petrol and also partially impregnated with petrol fumes. This would be sufficient to cause the explosion and immediate firing of the cockpit when a match was struck, with or without the oxygen jet.

Incidentally, it should be noted that a match applied to a jet, even of highly inflammable gas, will not cause an explosion. If a jet of, say, pure hydrogen be allowed to impinge on a lighted match, either the match will be extinguished (if the hydrogen is under high pressure and issues from a jet at high speed), or it will burn quietly.

WHY NOT JOIN THE FIRST ELEVEN?



Prune once belonged to a First Eleven, but not to the one we're writing about.

The Path Finder Force has been called the "First Eleven" of Bomber Command. Like any other first eleven, its members are chosen for ability. Unlike other first elevens, however, the places are not limited to eleven. There are places

in the team for all those who have the special ability required by the Path Finder Force.

What is this Path Finder Force anyway? Well, it's based on the very simple theory that if dropping eight thousand pounds of bomb exactly on a target is a Good Thing, then dropping eight *hundred* thousand pounds of bombs exactly on it is a Far, Far Better Thing. But getting a hundred different 8,000-lb. loads all "bang on" depends on the efficiency of a hundred crews instead of one; it depends on the ability of each of a hundred different crews to find and hit the target. And in a hundred crews there are bound to be some who make mistakes. For, after all, they are but human; they aren't born fully experienced; there are such things as flak, searchlights, smoke-screens, and other attempts at discouragement by unfriendly natives; and, above all, there is bad weather. As a result some of the crews lose their way, or cannot find the

target, or cannot hit it when they have, or go and bomb a decoy. And so a fair part of your 8,000 lbs. of bomb isn't earning the taxpayers' money.

Yet there are also among any hundred crews a small number with great experience and a standard of ability which can be relied upon to find the target in a very high percentage of cases. Hence the Path Finder Force. It is made up of crews above average, of crews selected for special intensive training, and then given the best special navigational and bomb-aiming equipment. It is the particular duty of these Path Finders to find, light up and/or mark the target for those that follow after. Thus the efficiency of the whole force is raised by the specially qualified efficiency of a few. And as a result you don't waste so much of that 800,000 lbs.

Don't think, by the way, that there is anything particularly derogatory in being one of those that follow after—any more than there is any particular added glory or danger in being a Path Finder. The ideal, of course, would be to train every single crew in the Air Force up to the higher standard, but there is neither the time nor the equipment for this. All that the Path Finder system does is to concentrate on the training of a selected few in order to lighten the task of the many and make their work more effective.

But, as we said above, the Path Finder Force (flying Halifaxes, Stirlings and Lancasters) is open to all in Bomber Command. That is to say, anyone of you who possesses the special ability

required, whether in a Squadron or at the O.T.U., will be selected for it, and asked if you wish to volunteer. There is your chance then right at the start, whether you are Pilot, Navigator, Air Bomber, W/Op-A/G., Flight Engineer or Air Gunner. Provided your character, proficiency, navigational knowledge and so on are above average you have every chance.

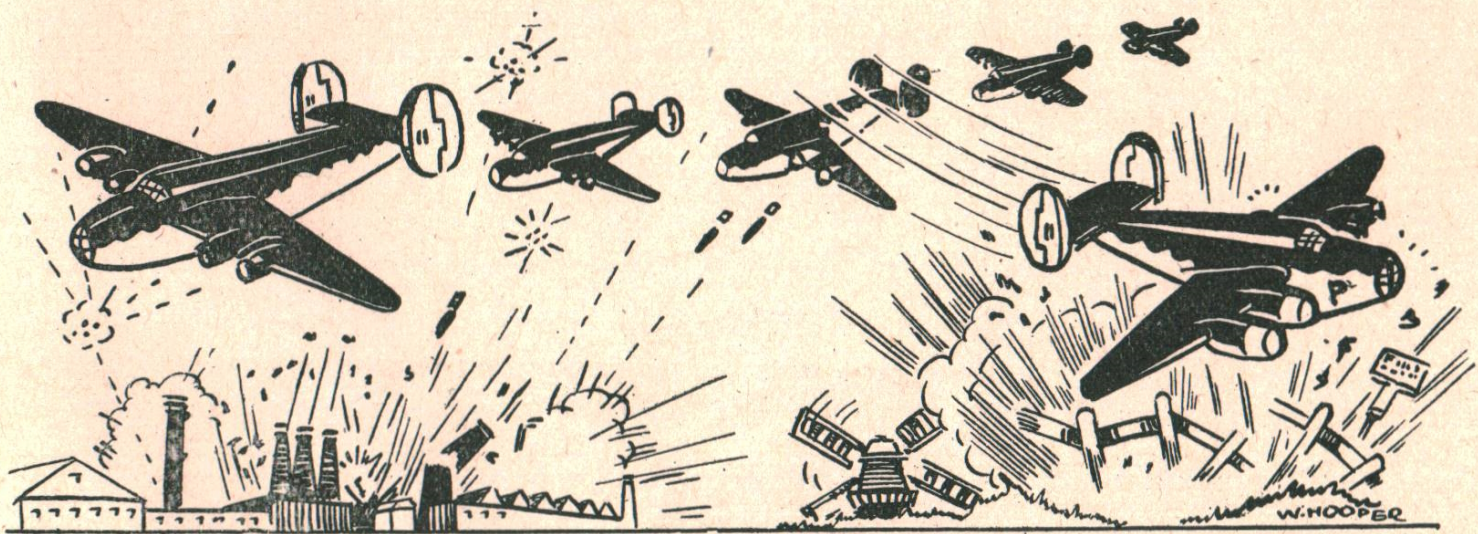
Selection means volunteering for the necessary number of trips, passing the qualifying tests before being graduated for target-marking duties, and being granted the special Path Finder Force badge (a small gilt R.A.F. eagle above the top left-hand pocket button), with permission to wear it permanently thereafter if the tour of duty is satisfactorily completed.

So if you think you are the type, work hard for it. Not for any added honour or for any material benefit. But simply because you will be doing the job for which you are best fitted. You will be making the best use of the ability and efficiency that God and your expensive training have given you. You will be increasing the efficiency of Bomber Command. You will be helping to shorten the war.

Path Finders should be confident of their ability to

Get there
Find it
Light it
Hit it

and then all the other boys, confident in your ability, will be sure of doing so too.



Prune doesn't need a Pathfinder ; he prefers to find his own.

KEEP TO THE PROPER ROUTE

REPORTS of flak experienced from several well-defended areas, not on the route ordered, suggest that some aircraft may have been lost through not following the route. There is nothing in the experiences of returning aircraft to indicate that successes (by flak) should have been achieved on this scale unless individual aircraft strayed from the correct route and flew over well-defended areas.

THE CADETS WANT TO KNOW

ONE of the A.T.C. Squadrons and the R.A.F. Station to which it is affiliated have, so we have just heard, invented rather a good little training scheme. It is a sort of local "Brains Trust," the members being three R.A.F. officers on the Station and the questioners naturally being the visiting A.T.C. Cadets. The three members, of course, have each a different function on the Station so that a fairly wide field can be covered.

The Trust we were told about was made up of a Flying Instructor, the C.G.I., and the Met. Officer, and the Station was an A.F.U. And here, to give you an idea, are a few of the questions asked.

The C.G.I. was asked among others: "Has this A.F.U. passed through any ex-A.T.C. cadets yet? If so, have they been more adaptable at this stage than direct-entry men?" "What are the three outstanding features of the Liberator B.24?" "Does the lack of ceremonial parades have, in the opinion of the Brains Trust, a tendency to reduce the discipline, efficiency and *esprit de corps* of the Force?" "Would night flying for cadets be of material benefit in their training?" "What is the authorised establishment of Gremlins for a (P) A.F.U.?" And many others.

The Flying Instructor was asked: "Why does an Oxford roar like a Harvard on steep turns and pull-outs from dives?" "Is it the opinion of the Brains Trust that training on the Link is likely to create flying faults hard to eradicate in a pupil who has never handled an aeroplane?" "What is the function of the 'step' on a flying-boat hull?" And so on.

One that the Met. Officer got was: "Can the Brains Trust account for so little thunder this year?" All the Trust *en bloc* was asked its opinion on this: "What is the most effective weapon—the dive bomber or the low-level fighter-bomber?"

Well, that's just to give you an idea. Like the china egg in the hen's nest, we put it out in case any other R.A.F. Station which is regularly visited by the A.T.C. might like to try it. It might even be to the advantage of the Brains Trust as well as the questioners!

Personally we'd hate to have to answer any question put to us by an A.T.C. cadet. They know so *much*. In our opinion V.C.'s have been won for less.



Prune is completely at his ease answering the Cadets' questions.

THIS MONTH'S PRUNERY



THE MOST HIGHLY DEROGATORY ORDER OF THE IRREMOVABLE FINGER (Patron: Pilot Officer Prune) is this month awarded to All Concerned in the following incident, for Going Completely Haywire.

On the morning prior to a sortie, the compass of an aircraft was swung, and a very peculiar deviation curve was detected. This was ultimately traced to the fact that the man reading the landing compass had been carrying a large torch in his pocket. The discovery was not made till just before briefing, and, owing to bombing-up, a second swing was only begun an hour before take-off. This time it was discovered, after correcting the two co-efficients, that the deviations had all been given the wrong sign. A third attempt was made, assisted by the

Navigator of the aircraft, who calculated out co-efficient "C" as:—

$$\text{Deviation on } \frac{S}{2} - \text{Deviation on N.}$$

and corrected as such. The resulting chaos could not be ironed out in time and the sortie had to be cancelled.

NOTE

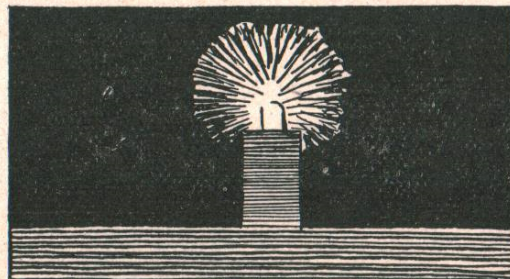
With reference to the Order of the Irremovable Finger awarded last month for Navigation to Group Captain —, who, flying his own Moth, landed at a Station and had to read D.R.O.'s before he discovered what Station he was at, we regret that it is not our policy in these awards to mention names. We can, however, publicly state that it was *not* any of the five Group Captains who at different times since the award have approached us secretly and said, "I say, how did TEE EMM find out about me?"

IT PAYS TO RECOGNISE

THERE have been altogether sixty-seven cases during the month when the bomber on seeing the fighter approach definitely opened fire first. Only nine of the fighters persisted in their attack and of these three were destroyed and three damaged. In other words, quick recognition means getting in the first blow. And the first blow is often the most valuable."

LINES FROM PRUNE'S SHOOTING GALLERY

Bad weather! Why, when I landed visibility was so poor I had to ask for Q.D.M.'s to get to the Control Tower.



THAT RANGE AGAIN



Get really close, says Prune.

We published last month an article on the value—say rather, necessity—of close range. Here are a couple of stories which go to show how close range really does the trick :

“Two Spitfires took off from — on a shipping reconnaissance. An E/A, recognised as a Ju.88, was soon sighted at 300 feet flying north. The section circled inland and approached the E/A from astern ; the first pilot attacked from 200 yards astern setting fire to starboard engine and knocking off fragments from the fuselage and port wing. The attack was then continued by the second pilot from 150 yards astern concentrating on the port engine. There was an explosion in the cabin and the E/A caught fire and crashed into the sea.”

And again : “Two Typhoons saw a Ju.88 and attacked it from ranges between 600 and 200 feet. With both engines smoking the E/A disappeared through cloud and a large patch of oil on the sea marked its final resting place.” Note that the range isn't given in yards in that one. It was 600 to 200 feet.

The following successful end to a combat, however, was more good luck than good management : “A Mosquito when flying about 60 miles east of — sighted a Ju.88 flying south-east at 4,000 feet. The E/A was attacked with three or four short bursts from extreme range and its starboard wing fell off. It was then seen to crash into the sea and is claimed as destroyed.” Good shooting, but don't take that as an example to be blindly followed. Why not use the superior speed of the Mosquito and close the range? Shooting at extreme range frequently gives warning to the E/A, enabling him to evade subsequent attack.

PILOT'S NOTES

RECENT issues of Pilot's Notes are : Hotspur I and II, Martlet IV, Wellington VI, Hudson I and II (2nd Edition), and Hudson III (2nd Edition). The first of the NEW printed editions foreshadowed in “All About the Handling Squadron” in the October 1942 TEE EMM is also out: it is the Lancaster I (2nd Edition).

Recent issues of Pilot's Notes, General, include Note 20, Sea Rescue Equipment and Procedure ; Note 21, Returning After Engine Failure ; and a revised Note 13, Fuel Economy, Range and Endurance. The following are recent Amendments :—

Hurricane II	. . . . .	A.L.31/M.	Revised engine limitations.
Mosquito F.II	. . . . .	A.L.3/A.	} Revised economical cruising and fuel consumption figures.
” T.III	. . . . .	A.L.1/A.	
” B.IV	. . . . .	A.L.5/D.	
Mustang I	. . . . .	A.L.2/B.	
Spitfire V	. . . . .	A.L.20/H.	Supplement on the Seafire.
Spitfire VI	. . . . .	A.L.13/D.	Revised fuel consumption.



He didn't hold with wearing a
Mae West.

TEE EMM is an O.U.O. publication, which means it is for Official Use Only. And this means that those not entitled to see it are *not* to see it. It is primarily a Training Memorandum for air-crews, instructors and all those in the Air Force connected with these jobs. It is, in short, a Service Training Memorandum written *for* the Service and issued *by* the Service in the person of the Air Member for Training.



Fraser

NOT to be taken into the air