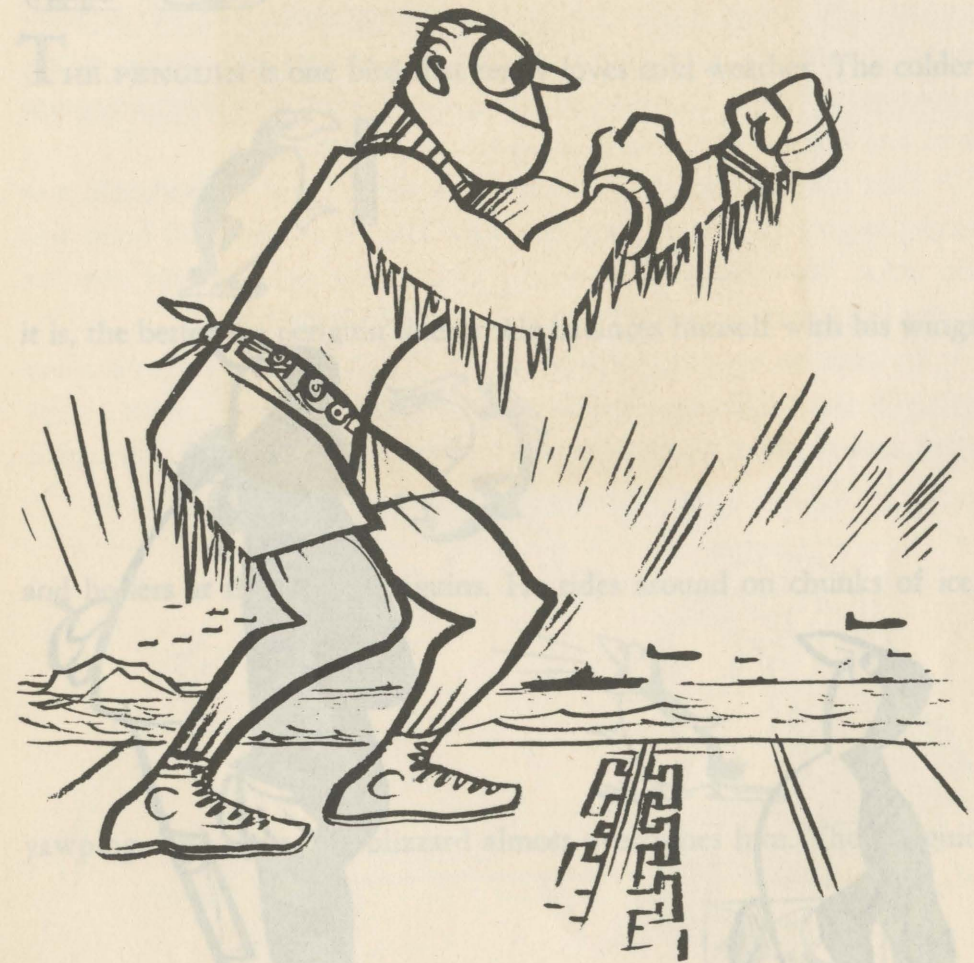


CARRIER COLD WEATHER FLYING SENSE



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1948

CARRIER COLD WEATHER FLYING SENSE



ISSUED BY AVIATION TRAINING SECTION,
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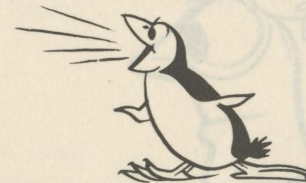
THE PENGUIN is one bird that really loves cold weather. The colder



it is, the better the penguin likes it. He balances himself with his wings



and hollers at the other penguins. He rides around on chunks of ice,



yawping. The sight of a blizzard almost overcomes him. The penguin



is a good natured but simple-minded fowl.

The savvy pilot, the well informed bird man, doesn't pretend to love cold weather. He would no more choose a regular run over the South Pole than a penguin would put out fifty cents for a Turkish bath.

Flying in cold weather is tough *because* the weather is cold. Drastically low temperatures mean lower human efficiency. The lower the mercury, the longer it takes people to get things done. Yet cold-weather flying requires the best a pilot can offer in alertness and precise, painstaking preparation. It means planning ahead when the normal impulse is to find a warm sack and hole up for six months.

That may be why the penguin, with the I. Q. of a doorknob, was forced to give up flying a long time ago. The tax on his small brain was too great. Now he shuffles around looking for pebbles and uses his wings for swimming or to keep from falling flat on his bill.

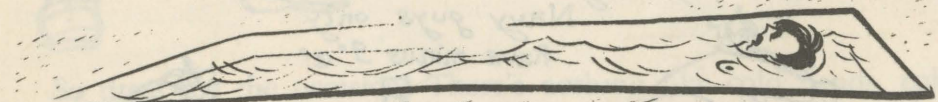
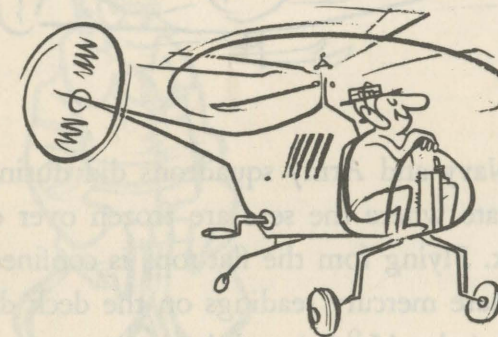
In addition to extra alertness and expert pre-flight preparation, flying in the frigid zones makes other demands on pilot, flight equipment, and airplane. Clothing must fit perfectly if it is to give reasonable



protection. The plane has to be fitted out with elaborate de-icing equipment which must be operated skillfully. Tougher-starting engines need

a smart hand at the controls. Quick shifting weather requires a quick shifting pilot. Icing is a real menace. Some instruments go haywire in certain areas. Navigation is sometimes a full-time job. And survival may mean a tight struggle between the rescue forces and time.

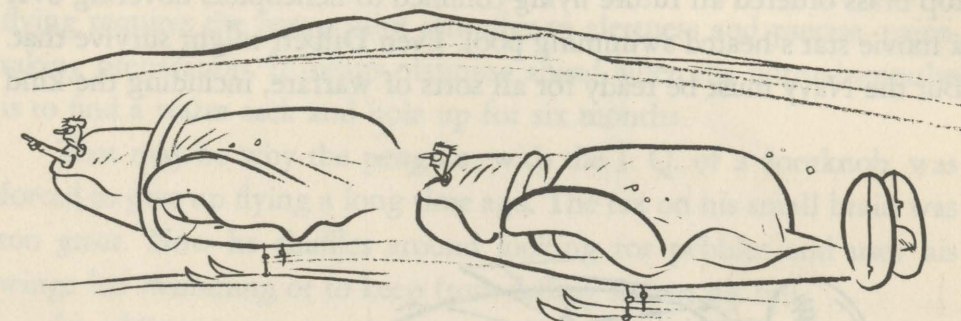
Everybody could relax—the Navy, the taxpayer, and you—if the top brass ordered all future flying confined to helicopters hovering over a movie star's heated swimming pool. Even Dilbert might survive that. But the Navy must be ready for all sorts of warfare, including the kind



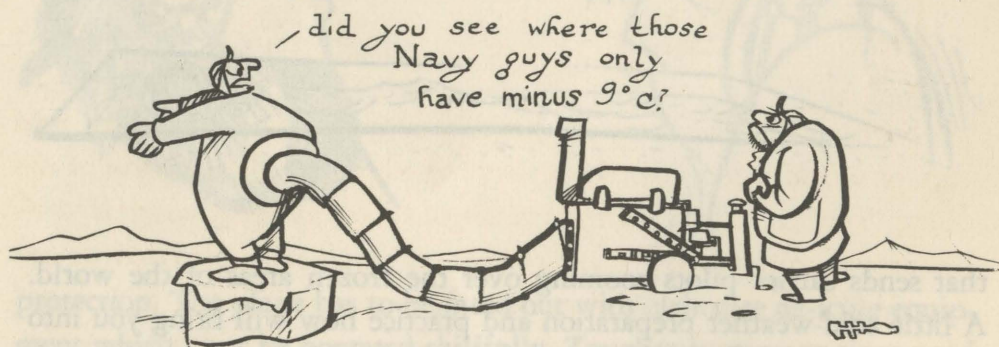
that sends carrier pilots zooming over the frozen areas of the world. A little cold-weather preparation and practice now will bring you into it with open eyes and a head full of knowledge.

STOW THE SHIVERS

Fortunately, the carrier based pilot gets a cold weather break. Land-based people, contending with ground temperatures of fifty or so below, have to start, warm up, and take off in an almost perpetual cold blow,



just as some Alaska-based Navy and Army squadrons did during the war. But carriers don't operate where the seas are frozen over or icy spray plasters the flight deck. Flying from the flat-tops is confined, for the most part, to regions where mercury readings on the deck do not fall much below minus 9° C. (plus 15° F.) and the temperature of the



sea is above freezing. In terms of you and the body beautiful this is cold, but in terms of your airplane it means relatively easy starting, warm-up, and launching. The preliminaries are not the problem they are for the landbased boys, who sometimes can't see the planes for the ice cubes.

But even so, you'll be doing business a long way from the Equator, in spots where suntans are not for free.

THE WELL PADDED PILOT



So dress for the occasion. There's nothing like cold hands, cold feet, or a cold rump to make a sissy out of the toughest cookie in the Navy. You can start beating the frigidity by padding yourself with the proper cold weather flight clothing, thoughtfully provided by the Supply Officer. But the stuff is useless unless it fits. Try it for size and then try it again, no matter whether you aggravate the entire issue room.

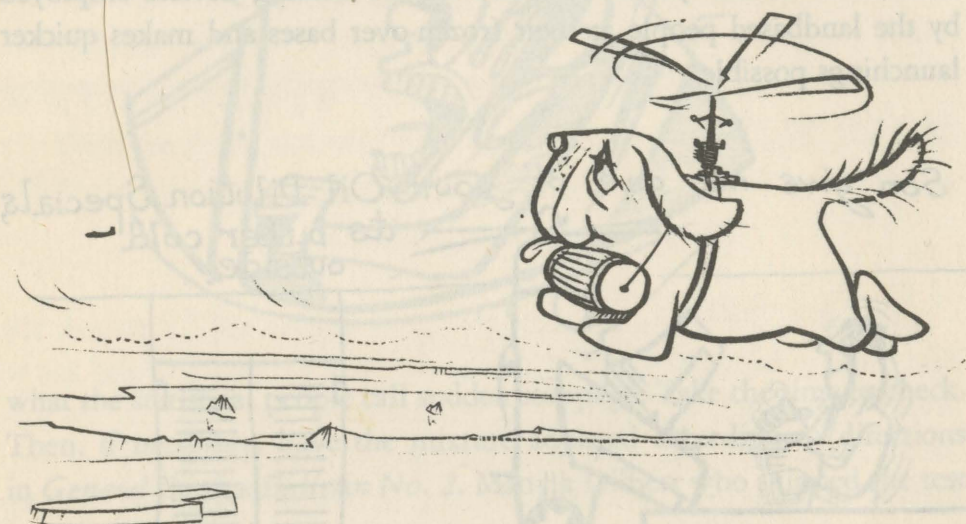
Dilbert can't waggle a finger in gloves that are too small and he is all thumbs in the giant sizes. Calf-length pants give him the New Look and also pneumonia.



The idea is to protect yourself. If you draw an electrically heated suit, get the word on the way to operate it. And the straight dope on which hooks to fasten and zippers to yank in order to drape it around



you correctly. Grab every bit of useful covering you can because your body will holler for more, at least until it starts becoming acclimated. No flying Saint Bernard wings after you with a keg of brandy when you begin shivering, although the idea has merit and might eventually be taken up by somebody in Washington.



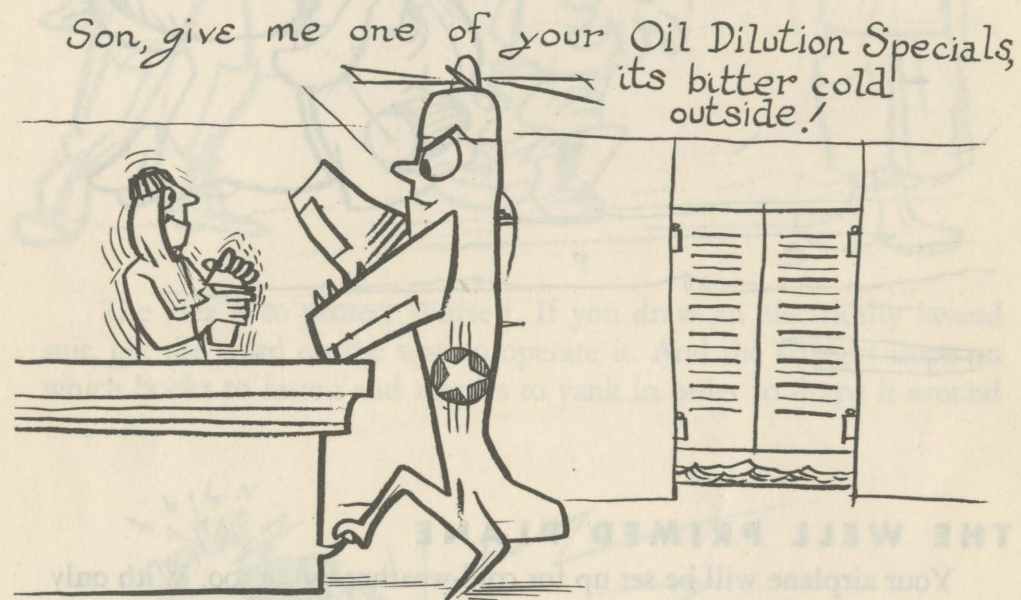
THE WELL PRIMED PLANE

Your airplane will be set up for cold-weather flying too. With only a few alterations, the same plane you flew around San Diego can make its way around Greenland, but the differences must be understood.

Oil dilution, for instance. Anytime the temperature seems likely to fall below 2° C. (35° F.), engine oil will be diluted with fuel for easier starting and quicker warm up.* The principal reason for dilu-

* See *Cold Starting Sense* and the appropriate technical notes and orders. These remarks do not apply to jet planes.

tion, as you know, is to get a quicker flow of oil moving around through the engine on cold days. Properly performed, the process cannot possibly harm your power plant. All you have to remember is that you'll take off with about ten per cent less oil in your tank than in warm weather and make your plans accordingly. Used aboard ship, dilution helps to eliminate the clumsy coverings and engine heating devices employed by the landbased people at their frozen-over bases and makes quicker launchings possible.



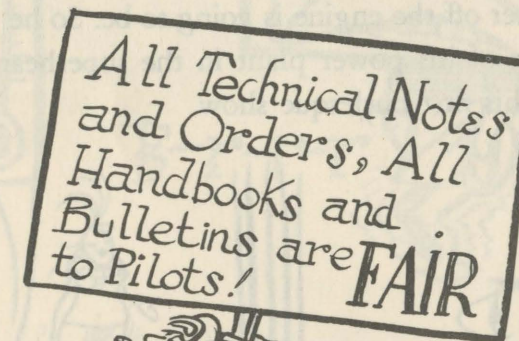
Because warm up has to be performed with a certain extra amount of care in cold weather, the smart pilot never neglects the Idle-Mixture Test set forth in Technical Order 80-44.

Fail to make the test on an engine getting too rich a mixture and you can wind up with fouled plugs. Skip it and you may let yourself in

for that supreme aviation thrill — an engine failure on take-off. In cold weather the tendency is to set too rich a mixture, a trick that can lead to



what the statistical people call sudden stoppage. Take the time to check. Then, if necessary, have the mixture adjusted according to directions in *General Engine Bulletin No. 2*. Many a Dilbert who skipped the test

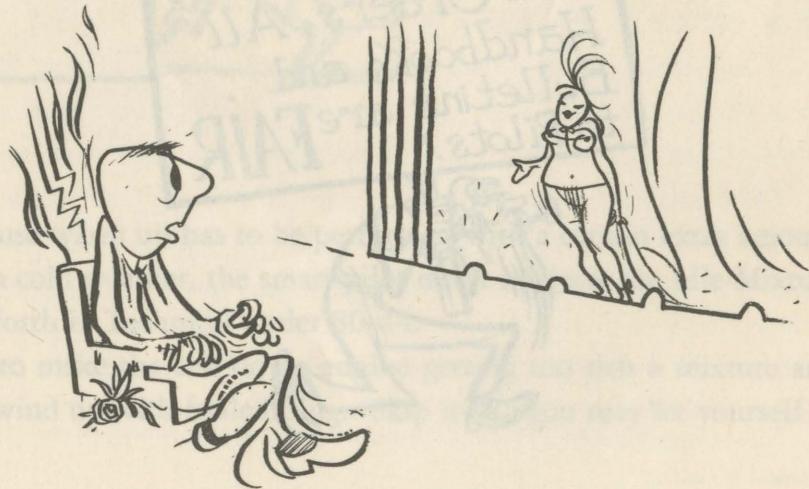


has found himself behind a conked-out engine on take-off, with the usual messy results.

Too rich an idle-mixture will partially foul your plugs as you taxi out of the gear after landing. Watch for smoke. If it comes out black and heavy when you open the throttle, you're fouling 'em fast; but even a little smoke means partial fouling. Remember: you don't *have* to have fouled plugs just because the weather is cold. They don't go together like ham and eggs. If the idle-mixture is set properly, you foul up neither the plugs nor yourself.

The gent who remains a permanent fixture
Always checks his Idle-Mixture.

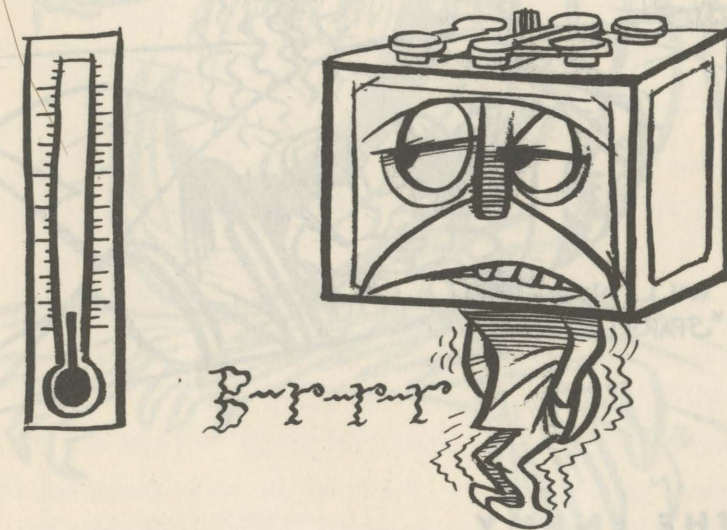
As far as the care and feeding of your engine are concerned, the best bet is to follow the wise words of the *Pilot's Handbook* and not to invent procedures, no matter how sensible they may seem at the moment. The handling of cowl flaps, for example, tempts Dilbert's experimental nature in cold weather, when he figures the tighter everything is closed up the better off the engine is going to be. So he winds up the warm up with parts of his power plant in the superheated state of a high school boy at his first burlesque show.



The experts warn against allowing the engine to heat up or cool off too rapidly. Even in the most frigid weather it's possible to overheat an engine by closing it off completely from the outside air. In a prolonged glide or long approach, of course, it's sensible to shut the cowl flaps to avoid fast cooling, but the word is to open them again as soon as you hit the deck.

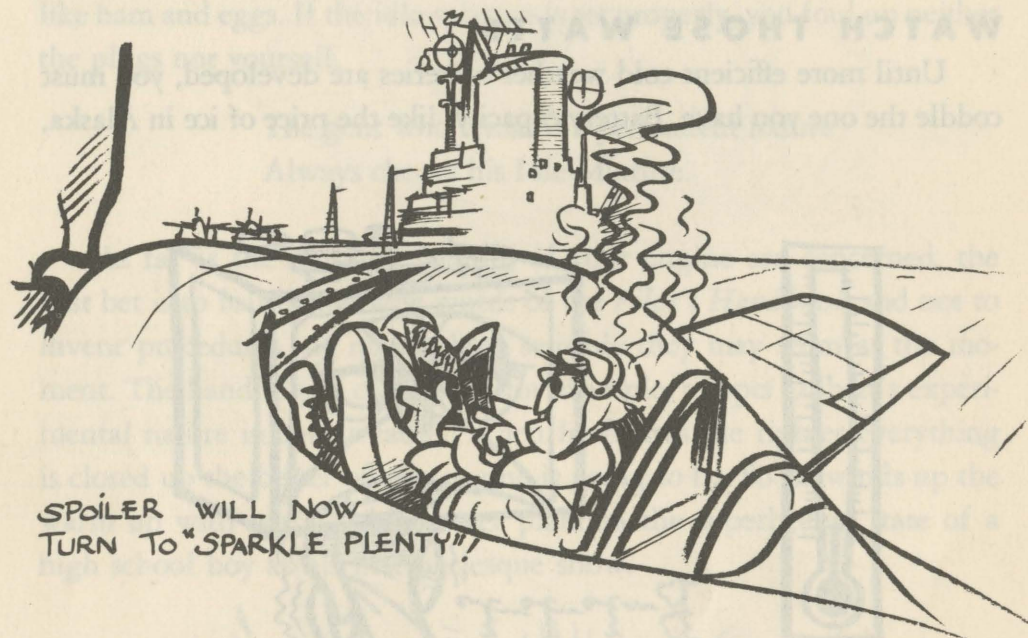
WATCH THOSE WATTS

Until more efficient cold weather batteries are developed, you must coddle the one you have. Battery capacity, like the price of ice in Alaska,



goes down with the mercury; and even normal use takes more out of the juice box in the cold season than in July. For this reason auxiliary power units are used to crank up your plane and you are urged to avoid excessive drain on the battery during long periods of idling when the generators are cut out. With electric flying suits, gun heaters, and other

gadgets draining off electricity in cold weather, it's wise to cut down the use of the radio and other electronics gear to a minimum until you're in the air, generating your own power. Keep an eye peeled also for check crew members with a habit of dozing off in planes with electrically heated clothing going full blast. If somebody spends a couple of hours curled up with Flash Gordon and the heat on, the next time you need a hot spark all you'll get is a faint squiff.



SPOILER WILL NOW
TURN TO "SPARKLE PLENTY"!

MEET THE ENEMY

Enter the villain.

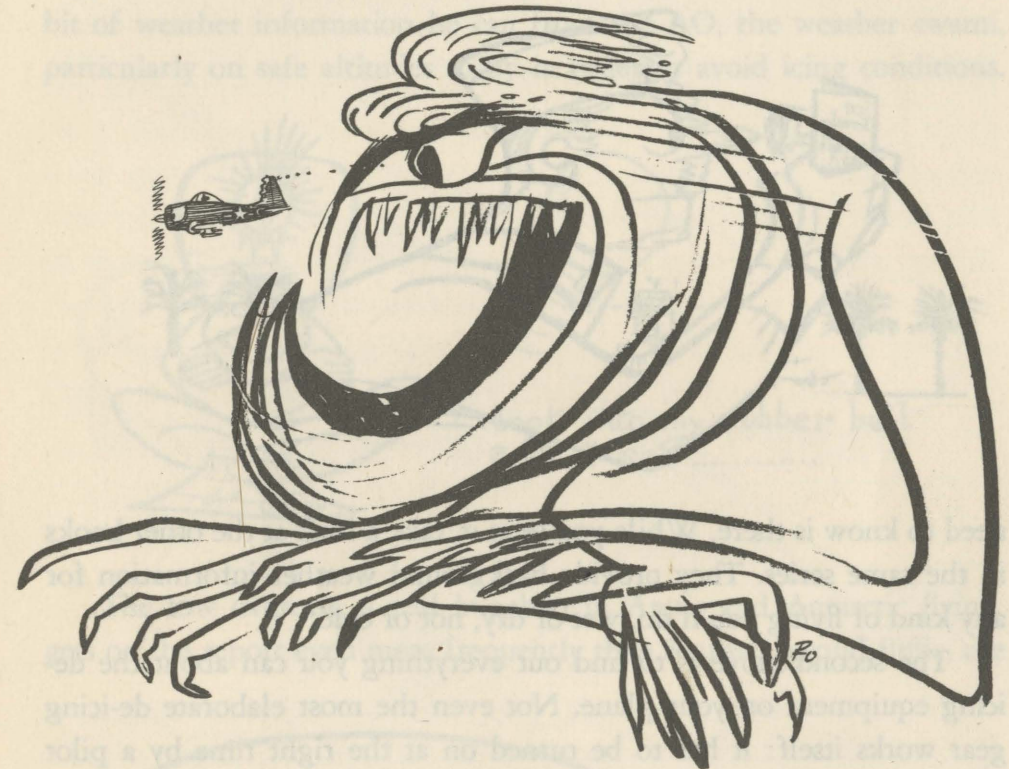
(A little sombre music, if you please, professor, heavy on the bass. This guy is worse than Jack the Ripper.)

He is the seen and unseen enemy, moving with as much menace as the villain in a cowboy movie, except that he's not fooling. He's always hanging around joints. Track him down and he can disappear

in a mist. He dazzles and blinds. He is at home everywhere, on the frozen land or in the clouds. He is a killer more dangerous than Dillinger or even Dr. Fu Manchu.

He ought to have a face that would be a cross between Boris Karloff, the Hound of the Baskervilles, and Jacques Frost; but he looks as innocent as a baby.

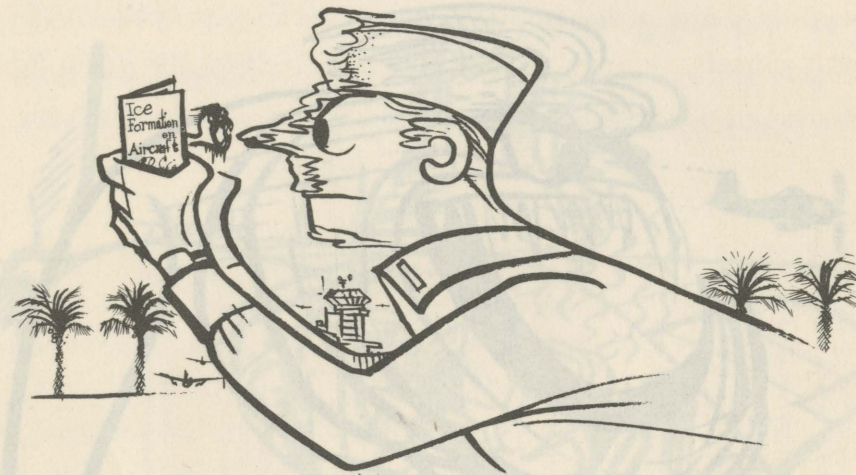
His name is Ice and he ain't nice.



The discomforts of cold can be endured — not with a grin, maybe, but endured. The extra precautions to be taken with your engine are a nuisance but they're simple enough. The point is, you don't have to think about them with the persistence of a chorus girl wangling a new convertible out of Daddy. But you've got to think about ice. Any cold weather veteran will tell you the best way to beat this boogey man is

to know all his tricks and have a few extra ones of your own up your sleeve to outsmart him. Cold weather flying and ice go together like salt and pepper or Iowa and corn.

The first step is to find out all you can about ice and its sneaky habits long before you have to find out the hard way. The best introduction is in the little book, put out as part of the Aerology Series, called *Ice Formation on Aircraft*. The dope is good and most of what you

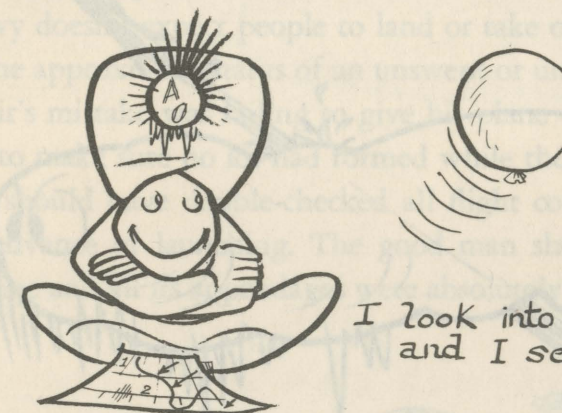


need to know is there. While you're at it, take a look at the other books in the same series. They provide background weather information for any kind of flying you'll do, wet or dry, hot or cold.

The second move is to find out everything you can about the de-icing equipment on your plane. Not even the most elaborate de-icing gear works itself: it has to be turned on at the right time by a pilot sufficiently savvy to know icing conditions when he sees them. Only Dilbert figures that the time to turn on the gadgets is when he observes ice forming outside. That may be too late. *It's the conditions making for ice formation that must be recognized.* After all, ice can form in places where not even the sharpest eyes in the Fleet can spot it — around the carburetor, in the pitot tube, or at control joints.

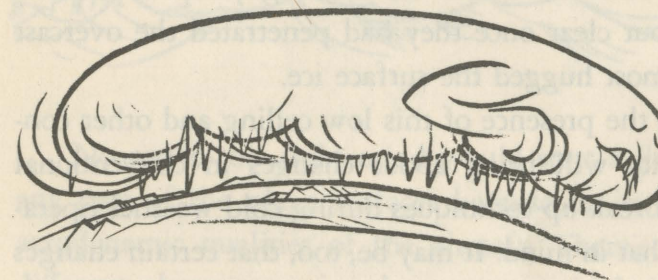
NOW MEET A FRIEND

Any sharp cold weather pilot is sold on Aerology. He knows the fundamentals. What he doesn't know himself, he gets from close communion with the Aerology Officer aboard ship. The AO is the man with the word on what a pilot is likely to run into aloft; what's more, he can tell the pilot the best way to avoid the worst of it. Before every flight, the man who knows his way around in the cold extracts every bit of weather information he can from the AO, the weather swami, particularly on safe altitudes to fly in order to avoid icing conditions.



I look into my rubber ball
and I see

The low overcast, a real bugaboo in Arctic and Antarctic flying, gets on the report even more frequently than Seaman second Biffle, the



Why that
low
down
OVER
CAST!



Biffle

scourge of Breezy Point. Although carriers won't operate anywhere within shouting distance of the Poles (North and South), they can skirt around the margins of the extremely cold regions of the world, where this kind of overcast is commonplace. The experts report some pilots so cautious about icing conditions inside the overcast that they didn't dare do the smart thing, which was to get over it as quickly as possible. Instead, they tooled along at the base, where, to add to the general hazard of low-level flying, icing was as bad as in the clouds themselves. The word is to get through the stuff as quickly as possible,



de-icing gear working full tilt. Pilots on the Highjump expedition found conditions cold but clear once they had penetrated the overcast which down yonder almost hugged the surface ice.

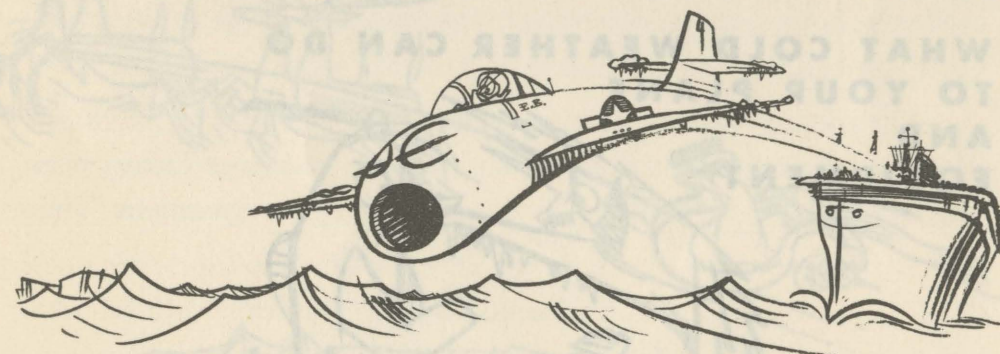
Indications are that the presence of this low ceiling and other conditions of poor visibility will bring about changes in conventional carrier rendezvous and break-up techniques during cold weather operations. You might bear that in mind. It may be, too, that certain changes in tactics will be in order.

DE-ICE WELL BEFORE USING

To all future cold weather pilots who think they know all about ice, the following is dedicated:

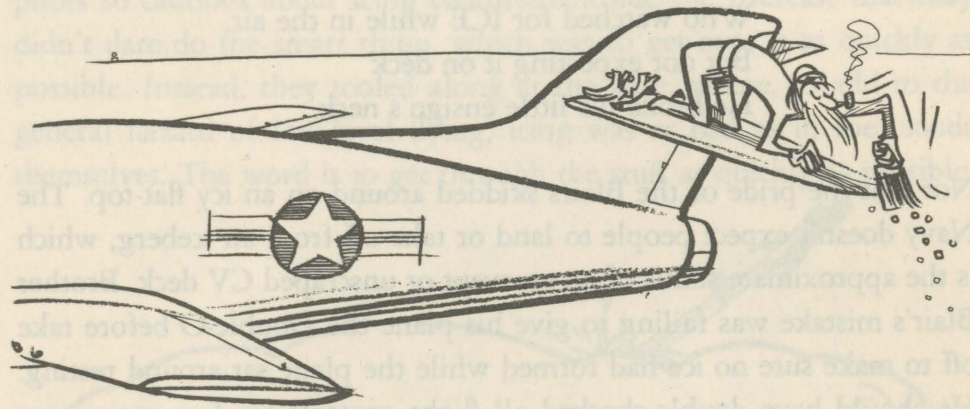
Say a prayer for Ensign Blair
Who watched for ICE while in the air,
But not expecting it on deck
He broke his little ensign's neck.

Not that the pride of the Blairs skidded around on an icy flat-top. The Navy doesn't expect people to land or take off from an iceberg, which is the approximate status of an unswept or unscrapped CV deck. Brother Blair's mistake was failing to give his plane the Double-O before take off to make sure no ice had formed while the plane sat around resting. He should have double-checked all flight controls for free movement in advance of launching. The good man should have made sure the engine and all its appendages were absolutely ice free. He didn't.



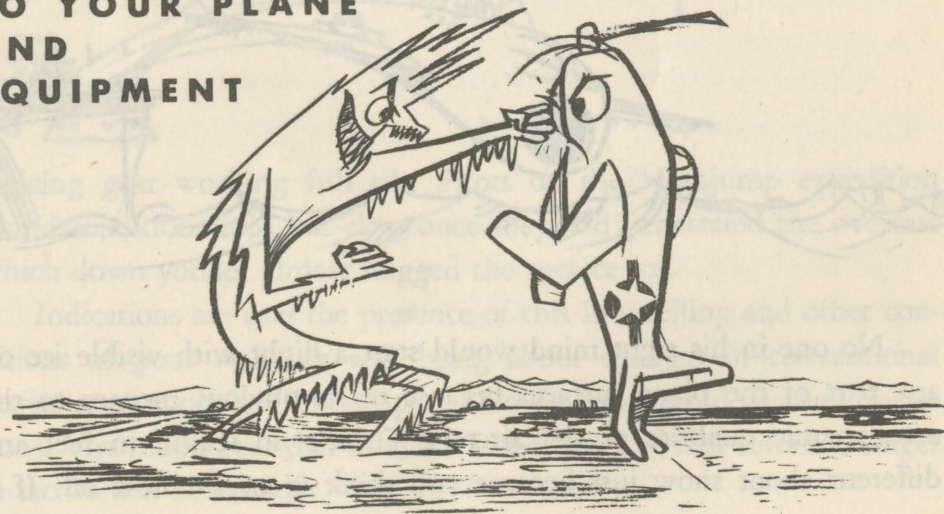
No one in his right mind would start a flight with visible ice on any part of the plane surfaces because of its obvious menace to the aerodynamic qualities of the aircraft. There's no reason to feel any different about snow just because you think it *might* blow off. If it

doesn't blow off — and Dilbert has discovered that there are times when it won't — snow is just as great a hazard as ice. The pilot who strings out fogey after fogey is the one who wipes off snow (a) by hand, or (b) with a large whiskbroom kept specially for the purpose.

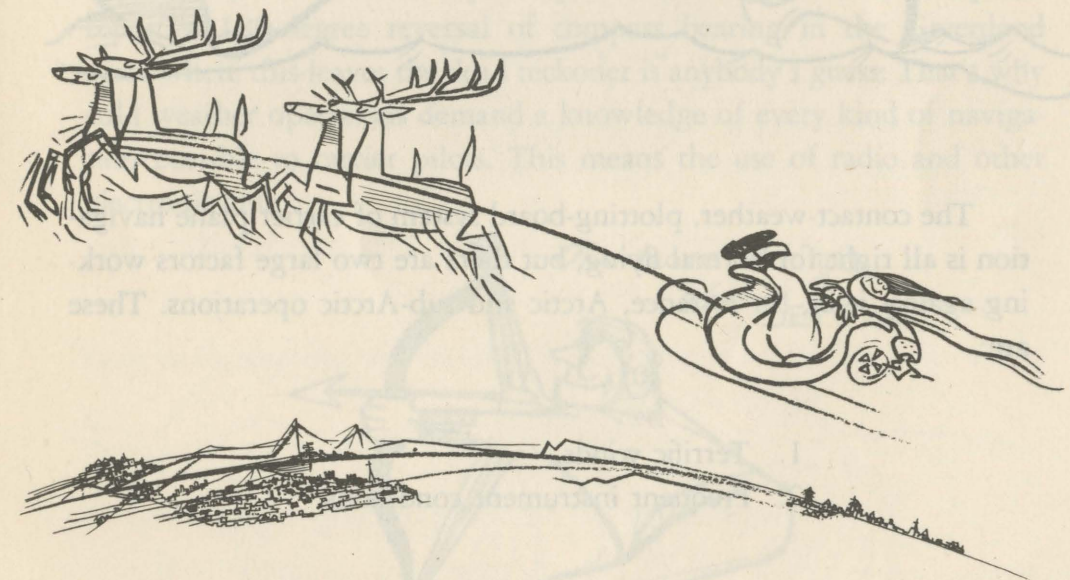


NEVER FORGET

WHAT COLD WEATHER CAN DO TO YOUR PLANE AND EQUIPMENT

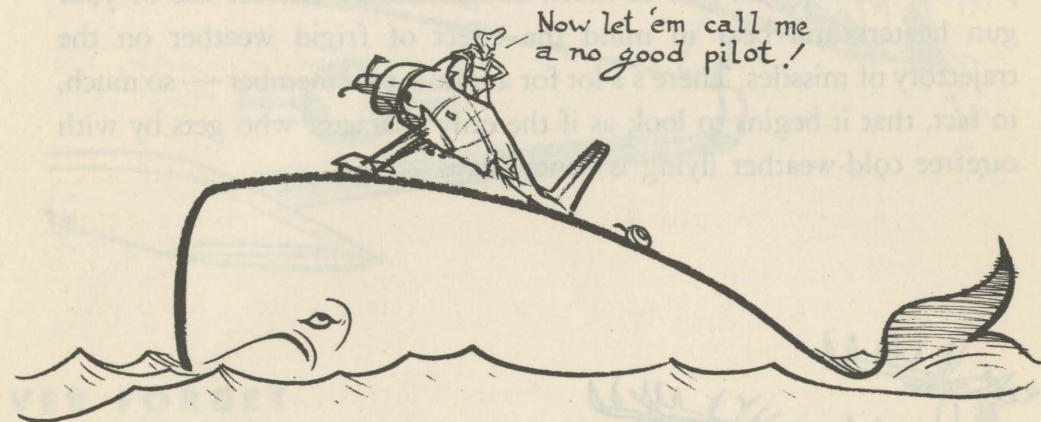


If you take off from a wet deck, it's a good trick to limber up landing gear, ailerons, flaps, and bomb bay doors to make sure the water splattered over them hasn't frozen stiff once you're in the air. Intense cold makes oil sluggish; so when you come around into the downwind leg, pump your brake pedals as you let down the wheels in order to help out oil circulation. If you suspect internal icing even when there's not a sign of it outside, the best bet is to change to an altitude where you know there won't be as much danger. Make discreet use of your gun heaters and bear in mind the effect of frigid weather on the trajectory of missiles. There's a lot for a fellow to remember — so much, in fact, that it begins to look as if the only character who gets by with carefree cold-weather flying is Santa Claus.



MAKING LIKE A PIGEON

In the middle of the cool ocean or over the frozen areas, there's no place to go but home. Even the most congenial gent is forced to fly back to where he started because that's where the only party is. Otherwise, unless he's lucky enough to land on a whale or plump down into a session of the Baffin Bay Chamber of Commerce, he'll be all alone. And this brings up the subject of navigation.

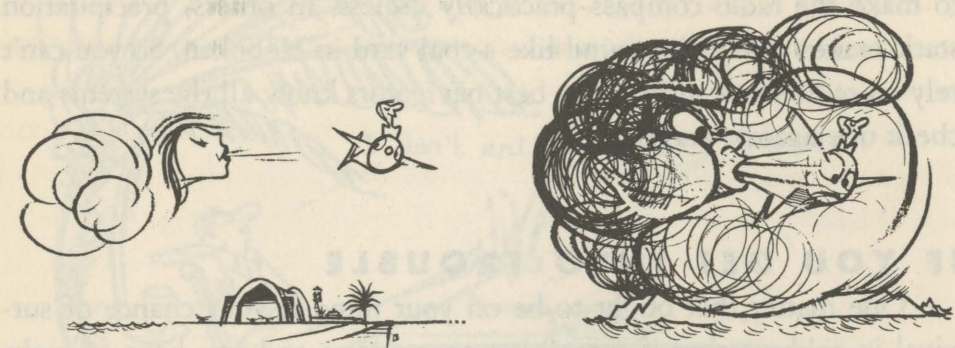


The contact-weather, plotting-board system of carrier plane navigation is all right for normal flying, but there are two large factors working against it in, for instance, Arctic and sub-Arctic operations. These are:

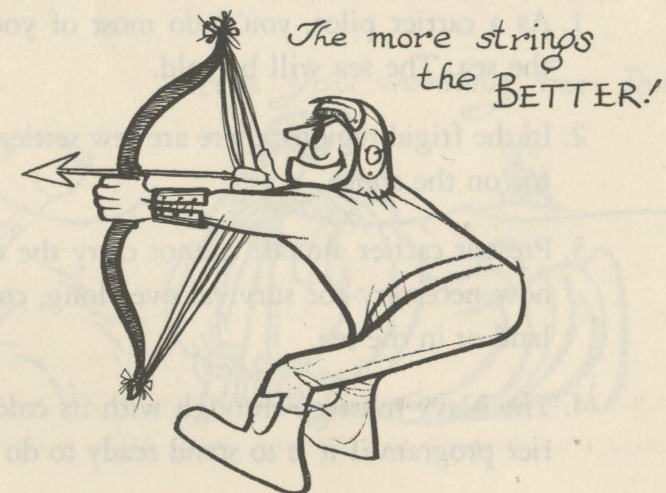
1. Terrific winds.
2. Frequent instrument conditions.

When Dilbert makes a navigation error in a ten-knot wind over Florida, he winds up somewhere in Alabama, with a fair chance of finding a

field to sit down in. The same kind of foolishness in a forty-knot gale around Greenland can dunk him a hundred miles off Cape Farewell.



Not even the canniest dead reckoner gets along on that system alone in a howling wind or when he's on instruments a good part of the time. Relying on one method of navigation in cold weather regions is like showing up for the Indianapolis speed race on a scooter. Some pilots report a 180-degree reversal of compass bearing in the Greenland area: where this leaves the dead reckoner is anybody's guess. That's why cold weather operations demand a knowledge of every kind of navigation possible to carrier pilots. This means the use of radio and other electronic aids.



Be sure to get the word on radio conditions in the operating area. In certain regions there are fake wave reflections sufficiently misleading to make the radio compass practically useless. In others, precipitation static makes your radio sound like a coal yard in Hoboken. So you can't rely on radio alone either. The best navigators know all the systems and check one against another.

IF YOU GET INTO TROUBLE

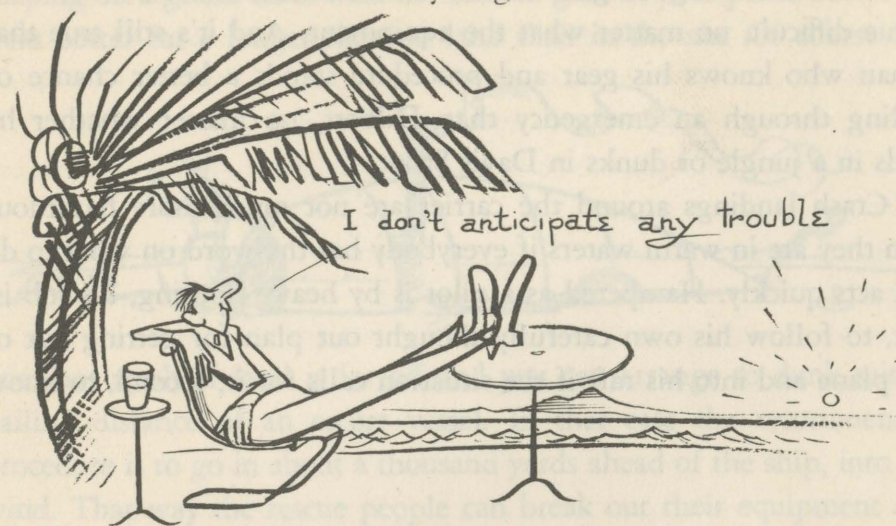
One matter that ought to be on your mind is your chance of survival in cold weather if something goes wrong and you have to make an emergency landing.



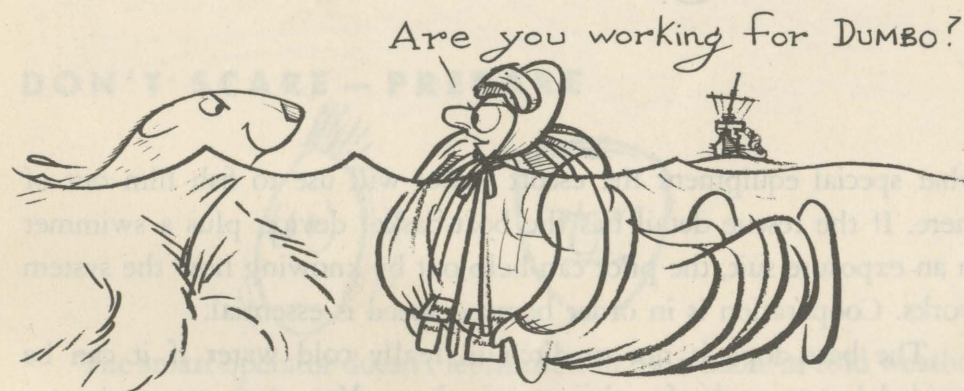
Here are the facts.

1. As a carrier pilot, you'll do most of your flying over the sea. The sea will be cold.
2. In the frigid regions, there are few settlements to make for on the shore.
3. Present carrier aircraft cannot carry the elaborate gear now necessary for survival over long, cold periods on land or in the sea.
4. The Navy must go through with its cold-weather carrier program if it is to stand ready to do its job.

Those are harsh facts but they've got to be faced.

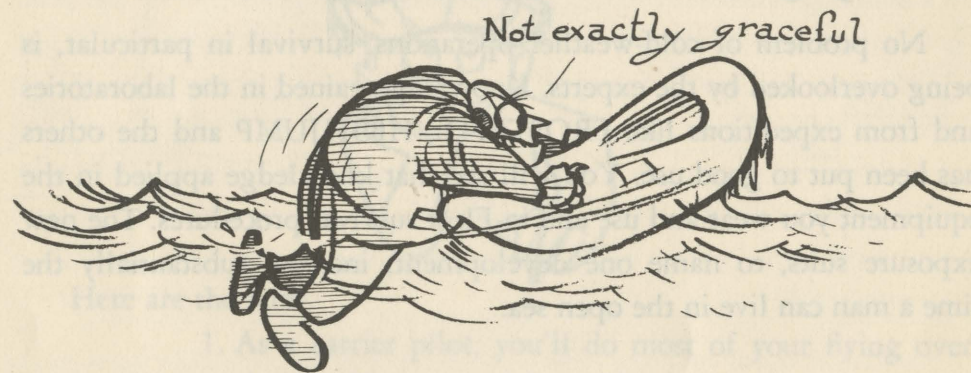


No problem of cold-weather operations, survival in particular, is being overlooked by the experts. Knowledge gained in the laboratories and from expeditions like FROSTBITE, HIGHJUMP and the others has been put to good use. You will see that knowledge applied in the equipment you wear and use and in Fleet survival procedures. The new exposure suits, to name one development, increase substantially the time a man can live in the open sea.



But there's no getting around it: cold weather makes survival and rescue difficult, no matter what the equipment. And it's still true that a man who knows his gear and procedure stands a better chance of pulling through an emergency than Dilbert, no matter whether he lands in a jungle or dunks in Davis Strait.

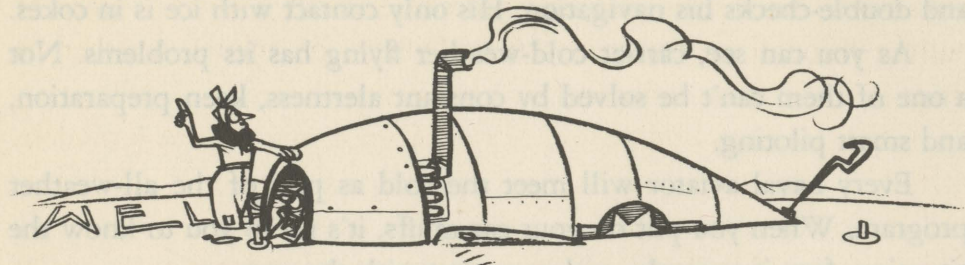
Crash landings around the carrier are not much more hazardous than they are in warm waters if everybody has the word on what to do and acts quickly. Hampered as a pilot is by heavy clothing, his job is, first, to follow his own carefully thought out plan for getting out of the plane and into his raft if the situation calls for it; second, to know



what special equipment the escort vessel will use to fish him out of there. If the rescue detail has the boat-basket device, plus a swimmer in an exposure suit, the pilot can help out by knowing how the system works. Cooperation is in order because speed is essential.

The best dope is not to ditch in really cold water if it can be avoided but to make for the nearest shore. You can't set up house-

keeping on a grand scale with the limited gear in your plane but you'll wear better for a longer time on land than in the sea. Of course this



does not apply if land is far off and you can arrange to dunk within hailing distance of an escort vessel. In that case the recommended procedure is to go in about a thousand yards ahead of the ship, into the wind. That way the rescue people can break out their equipment and prepare the swimmer while you're drifting toward them.

When you see one of your buddies ditch, don't ever let him out of your sight. Keep orbiting within a reasonable distance and give with the radio, ever mindful of proper wireless discipline. A crowd of frantic pilots yelling into their radios will foul up the detail at a time when a minute can mean a life. Remember this: *a pilot in ordinary winter flight gear will be paralyzed and near death in from eight to fifteen minutes if dunked in sea water that is near the freezing point.*

DON'T SCARE — PREPARE



The smart operator doesn't let himself in for trouble in cold weather areas. He watches his gas like a beagle. Ever mindful of erratic winds

and weather, he always allows himself a fat margin for getting home. He knows his radio aids the way Fatima knew her dance. He checks and double-checks his navigation. His only contact with ice is in cokes.

As you can see, carrier cold-weather flying has its problems. Not a one of them can't be solved by constant alertness, keen preparation, and smart piloting.

Every naval aviator will meet the cold as part of the all-weather program. When you put on your ear muffs, it's up to you to know the situation, face it squarely, and come out with the answers.

That way, you'll meet and beat the cold.

