AIR FORCE

THE OFFICIAL SERVICE JOURNAL OF THE U. S. ARMY AIR FORCES

NOVEMBER 1943

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Contents

DEPARTMENTS

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November Brief

THE BOMBING ATTACK which destroyed vital Axis oil refineries at Ploesti, Rumania, on August 1, was one of the most important aerial missions of the war. Back of the attack were weeks of intensive planning and training. A comprehensive report on the attack is presented in a special section of this issue, beginning on Pages 8-9. It contains the story of preparation, General Brereton's pre-attack message to his flight leaders, a first-person "over the target" account of the mission, a summary of the damage inflicted and photographs taken from the bombers during the attack.

AN ARTICLE on the importance of air discipline in bombing operations has been written for AIR FORCE by Brig. Gen. Frank H. Armstrong, Jr., former group CO in the 8th Bomber Command in England and now commanding general of a bombardment wing of the 2nd Air Force. General Armstrong participated in more than a dozen raids over the Continent. He was the lead pilot in the first American raid over France, in which only twelve B-17s took part, and he flew the lead plane again in the first American mass attack on Germany. General Armstrong was operations officer on General Eaker's staff when the 8th Air Force was activated, and he later commanded two combat groups. His real experience, General Armstrong says, was "just being with the men. I ate, slept and lived with them. I was a member of their outfit. That was the best of it—just being one of them. There's nothing quite like it." General Armstrong's article appears on Page 5.

OPPOSING FORCES inadvertently exchange equipment secrets during wartime. Early in the war, Axis forces learned much vital information about British and American aircraft from wrecked planes forced down over enemy territory. Enemy planes and equipment have come into our hands in the same manner. The article on Page 38 tells what our engineers learn in their examination of captured enemy equipment and offers many interesting comparisons of this equipment with our own.

THE FLYING TRAINING and Technical Training Commands have been consolidated to form the Army Air Forces Training Command, with Maj. Gen. Barton K. Yount, who headed the former flying training organization, as commanding general. The operation of our reorganized training program is described on Page 27. An organization chart of the new Command accompanies the article.

EVEN BEFORE the last Japs had been wiped out of the Aleutians, American bombers began softening the northern road to Tokyo with attacks on Paramushiru, important enemy base in the Kurile Islands. An account of the first two raids on Paramushiru has been written for AIR FORCE by Maj. Louis C. Blau, co-pilot of one of the bombers on the first raid and a flight leader on the second, and Maj. Frank T. Gash, also a flight leader on the second mission. Their article appears on Page 18.

IN ITS MAY issue AIR FORCE published a second lieutenant's account of his life in OCS at Miami Beach. A copy soon reached a forward base in New Guinea, where at least one reader was more than casually interested in the Miami Beach story. He, it seems, had been a member of the first class to go through OCS in Australia, and his routine had been so at variance that an article by him for AIR FORCE came "quite as natural as a newly dug slit trench after a surprise raid." We agreed. Lieut. W. F. Houha's story "OCS—Australia" appears on Page 22.

The Front Cover

The new P-51 Mustang, high-altitude fighter with the Packard-built Rolls Royce engine, is pictured on this month's front cover. Test pilots at Wright Field are enthusiastic over the combat possibilities of the new 51. They particularly praise its speed at high altitudes and ease of handling. An article describing the development of the P-51 appears in the Technique department on Page 31. Tech. Sgt. Roger Coster, staff photographer, took the cover photo at an east coast port of embarkation.

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CROSS COUNTRY

INCREASING emphasis is being placed on the importance of keeping all air crew members informed concerning targets for strategic bombardment missions, the value of the objectives to the enemy and the results to be gained by their destruction.

In tactical air force missions against military targets, crew members can see the enemy objectives and usually deduce for themselves the destruction hoped for in the attack. But in the strategic bombing of industrial and communications targets, it is more difficult for the average man to understand why a particular target has been selected and what the desired results might be. In fact, other objectives spotted from the air by the uninformed sometimes appear far more inviting than those selected for the mission.

Bombing objectives are selected for good reason, but unless they take on full meaning for every man participating in the attack, the operation can easily become "just another mission." This attitude can be avoided by the thorough briefing of air crews, by airplane commanders discussing missions in detail with members of their crew and informing them on the results of the mission. Ground crews, as well, can benefit from information on the accomplishments of bombing attacks.

These points have been stressed by returning combat crews, especially enlisted personnel, and Headquarters is encouraging appropriate action.

REPRINT OF THE MONTH

In the March issue we published an organization chart of the Army Air Forces and announced that reprints would be available. A flood of requests for the chart resulted. Appearing in this issue (pages 28-29) is the organization chart of the new AAF Training Command, in which the Flying Training and Technical Training Commands have been consolidated. A limited quantity of reprints has been made available for general distribution upon request to the Service Division, AIR FORCE Editorial Office, 101 Park Avenue, New York 17, N. Y.

SALESMANSHIP

"WHEN we landed that first day in Sicily everybody was friendly as hell," says Sgt. Robert M. Price, a paratrooper from Yakima, Wash. "They gave us everything. They took us down in their cellars and poured out big pitchers of red wine. They always washed the pitchers and took the first drink to show us it wasn't poisoned. That first day it seemed they couldn't do enough for us—and that wine was good!

"But next day it was different. They had cooled off, I guess. They decided there weren't so many of us and maybe we weren't so powerful after all. They surely were different.

"We had fifteen Italian prisoners and even they began to think the Axis would win. That morning we saw two American observation planes in the sky and we all stood there watching them. They were flying very slowly and looked about as defenseless up there as cow sheds.

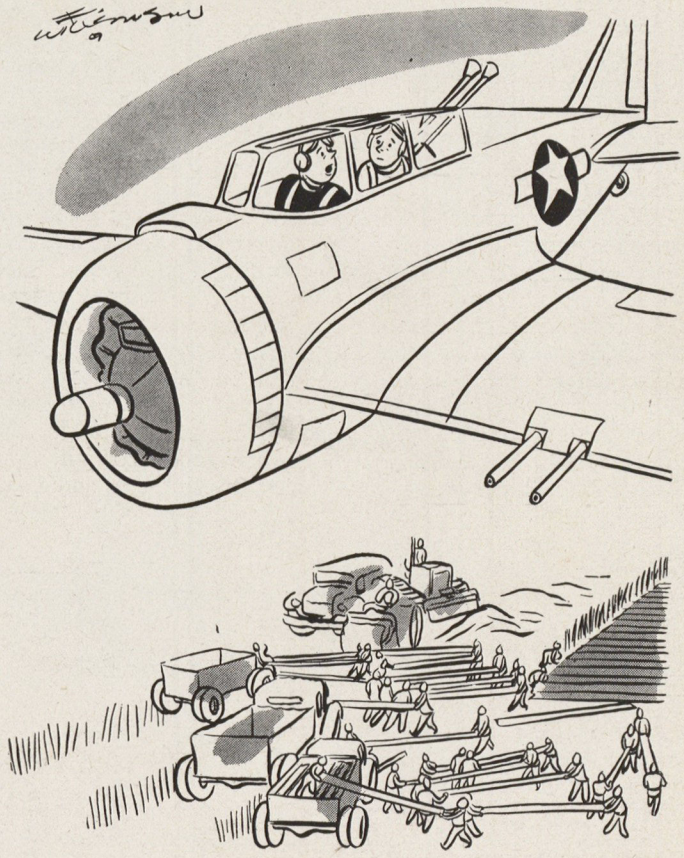
"Suddenly three Italian planes attacked them. The Italian prisoners jumped up and began to cheer. It didn't look very good for our side. We knew the American planes would be destroyed, and the Italians began making wisecracks.

"Just at that moment six P-38s dove out of the sky in a wedge and burst one of the Italian planes into flames. The P-38s climbed up again and came right back in formation. They tore the second Italian plane all to pieces. Then they got the third one before it could run away. It looked like those P-38s were putting on a show just for our benefit.

"All the while it was going on those Italian prisoners just stood there with their mouths hanging open. After it was over they sat down again. They said the Americans were okay. They didn't give us any trouble after that."

A DIFFERENT WORLD

That feeling of nearness to a Supreme Being which comes to many men in flight has been described many times, each man expressing it in his own way. This letter



"Our orders are to cruise around a few minutes until they build an airfield." —FRITZ WILKINSON

from a young flyer, to the parents of a pilot missing in action, seems to describe the feeling in a particularly sensitive manner.

"My deepest sympathy is always for the sorrow of those left behind, because often they cannot understand the philosophy of those of us who fly. When a man has spent hundreds of hours in the air, he finds quite a change taking place in himself. Those hours are spent (many of them in solitude) in an entirely different world from those to which he was formerly accustomed. Up there he has plenty of time to think as he views the limitless expanse surrounding him, and breathes the pure air that has not been soiled by our earthly life.

"He cannot keep from realizing his proximity to a Supreme Being and feels His hand guiding and holding the plane aloft. Actually he is sorry for the unfortunate earthbound people who never have experienced the privilege of such solitary communion. So beautiful are some of the sights viewed by a pilot that he can almost feel that he has been permitted a glimpse of what lies beyond.

"It is because of these thoughts and feelings that a pilot has no fear of what is to come. He knows that he is always welcome and has been so close so many times that he nearly knows what to expect."

That letter reminds us of what Wing Commander John Barnes, an RAF night fighter, said of the spiritual feeling which comes to many airmen. The Wing Commander, a song writer in civilian life ("Don't Sit Under the Apple Tree," "Little Lady Make Believe," and others) told how he felt after meeting the Nazis for more than a year in their rage to destroy England.

"You get so you enjoy it," the young Britisher said. "Remember that lovely poem one of your American pilots wrote, about being so high and solitary that you can almost 'touch the face of God.' Well, that's the way it is. You see a glow through a fringe of cloud and you dive out for it. Might be a Jerry's exhaust flame, you know. Then you come through the cloud and there, deep on the night's black velvet, shines a star. That's what it is—a beautiful star!

"It's beautiful when you're up 30,000 feet and look on the incendiaries in Kent, and then across the Channel you see our bombs retaliating, spilling their bloody hell on the French coast. It's the contrasts. You can't ever get used to them. If you follow my own thoughts you can see how these contrasts—the exquisite beauty of the countryside and the crash of death—are more dramatic than the war itself."

Read and Remember

Reports indicate that a surprising number of U. S. airmen shot down in Germany have neglected to carry their identification discs. It is reasonable to assume that due to this carelessness some of our dead have been buried without identification.

Without the regulation "dog-tags" our personnel can be held by the enemy as spies and saboteurs on the pretext that they cannot be identified as members of our armed forces. They may also use this pretext to put them in solitary confinement for fairly long periods for softening purposes and to attempt to elicit information from them.

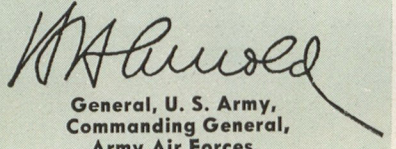
AR 600-40, Change 10, Paragraph 36, is very specific in directing that each member of the Army shall wear his regulation identification tags at all times.

HEADQUARTERS, AAF

To all Personnel:

Your attention is called to the increasing number of published statements attributed to Air Force personnel, containing expression of opinion on the length of the war, the quality of our efforts and the status of our opposition. Such opinions can serve no good purpose and when they are publicly interpreted to represent official viewpoints, they are both harmful and dangerous. If the present practice continues, the morale of industrial workers, our production of airplanes and estimations of the value of attacks on the enemy will be seriously impaired as each unfounded statement or ill-considered assertion is proved to be erroneous.

The Army Air Forces are making a magnificent combat record but we all must realize that we have a long bitter fight ahead of us. I want you to maintain your enthusiastic confidence in our purpose and methods. But only by greater effort, greater sacrifice and greater devotion to duty can we hasten the day of victory. Until that day arrives, let your work and your authorized spokesmen speak for you.



General, U. S. Army,
Commanding General,
Army Air Forces.

Sahib Snob

An AAF tech sergeant and his brother, a major with the Army Service Forces in India, had their pictures taken together just before the major left the States. Recently the sergeant received the following letter from his brother:

"My bearer—a Mohammedan boy who is the spice of life and breaks my monotony by efforts to get him to work—saw the picture of you and me the other day. With a very contemptuous sound he grunted 'sergeant!' Then he pointed to me and said, 'Master very big Sahib'."

After displaying this letter our sergeant slowly folded it and returned it to his pocket.

"I trust my brother hasn't lost too much face," he said.

Missing Parachutes

THREE stations have entered candidates this month in our who's who of missing parachutes. Many stray chutes are finding their way home through this monthly feature and all stations are invited to use this medium.

Lost:

One 24-inch chest type, Serial 42-766327; return to Commanding Officer, 22nd Transport Transition Training Detachment, DTR, ATC, Municipal Airport, Atlanta, Ga.

Number 42-193842 (Type S-1 AN-24); return to Headquarters, 387th Sub-Depot, Office of the Engineering Officer, Pecos, Texas.

Number 42-445971 (Type S-1); return to 34th Base Headquarters and Air Base Squadron, Squadron Engineering Officer, Grenier Field, Manchester, N. H.

Last Flight

Old 666 took off from a South Pacific airdrome one morning like any able-bodied B-17 and came back a pile of salvage wallowing through the sky. There wasn't much of her that hadn't been shot up and her bandaged crew resembled a rehearsal in first aid.

It was a reconnaissance flight over Bougainville Island and while photographing the Buka runway the crew spotted a string of enemy fighters, about twenty. Half of them taxied out on the strip to take off. But Old 666 headed south along the west side of the island and kept right on taking pictures.

The first fighter moved in, then three more, one sailing in low at ten o'clock. Fire from his guns wounded the bombardier, the pilot and the engineer, destroyed the hydraulic system, damaged the control cables, smashed the pilot's rudders, set the oxygen bottles in the cockpit afire and knocked out all flight instruments but the airspeed indicator.

The bombardier, despite his wounds, kept firing on the enemy fighter until it shattered apart. The navigator, though wounded in the face and unable to see his target, blasted away at another attacker while the pilot, wounded in the legs and arms, continued to fire a fixed gun at still another Zero.

An explosive shell crashed through the nose of Old 666 and knocked the bombardier and navigator back into the catwalk under the cockpit. A burst of small caliber slugs from the same enemy plane

wounded the radio operator and sewed a seam of holes in the fin. The engineer, wounded in both legs, kept his guns firing short bursts as he cleared them of repeated jams.

Despite his wounds and loss of blood, the pilot remained at the controls and managed to dodge some of the enemy and to maneuver the plane so his gunners could get cracks at the others for more than forty minutes. In this time at least five of the enemy were destroyed.

Once Old 666 had dived to low altitude, the navigator ripped out the oxygen bottles and extinguished the flames. When the attack finally ended the co-pilot set the throttles and turned the controls over to the engineer who had told none of the crew of his own wounds. With only airspeed indicator and magnetic compass to guide him, the engineer flew Old 666 for an hour and a half while the co-pilot and the few uninjured members of the crew administered first aid to the others.

The radio operator, severely wounded in the neck, continued to secure bearings and brought the big plane home. On reaching the airdrome the co-pilot took over the controls and found it impossible to lower the flaps. He nevertheless brought her in.

It was her final landing—she was grounded after that—but Old 666 got down and rolled in gently to spare her wounded further pain.

Caterpillars

That old AAF fraternity known as the Caterpillar Club has been gaining a number of members who don't seem to understand the status of their membership. Letters have been dribbling into the desk of Lieut. Col. Falk Harmel (not a Caterpillar himself but a sort of ex officio historian of the lodge) at AAF Headquarters, requesting information on initiation fees, membership dues, certificates and the like. The letters have come from personnel who are qualified for membership through virtue of the compulsory use of their parachutes on at least one occasion.

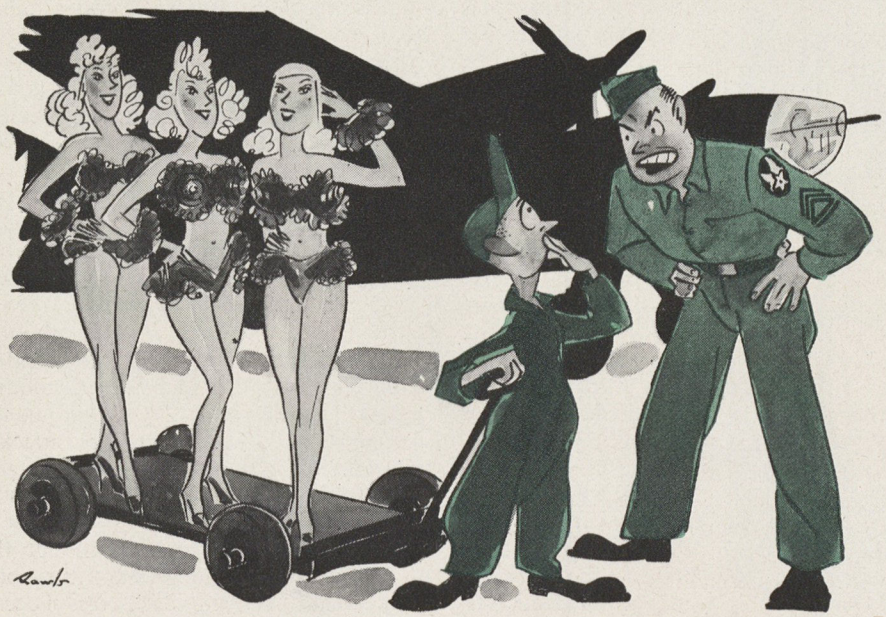
Colonel Harmel asks us to notify all past, present and future Caterpillars that a compulsory—and successful—bail-out is all that is required for membership in the fraternity. There was a time when a commercial chute firm distributed gratis small metal buttons emblematic of membership in the Club, but this token has long been dispensed with. And quite properly, since the metal required to make up buttons for wartime members alone might be sufficient to put the finishing touches on the Axis—or at least a touch. The records show that the Caterpillar Club was founded in 1922 shortly after Lieut. Harold R. Harris made the first free parachute jump when the plane he was testing at McCook Field, Ohio, developed a structural defect. The name Caterpillar was selected because of the kindred spirit existing between the men who emerge with a sigh of relief from the silky folds of their chutes and the little worms that crawl into the light of day from cocoons.

Motor Transport

The men who drive the truck convoys and supply the essentials of war have hung up such a great record that we sometimes take them for granted. Two recent citations have come to our attention and we are glad to report them here. The first is a general citation for a Quartermaster Company Service group (Avn), a Quartermaster Company, Truck (Avn), and an Ordnance Company, MM (Avn), all of an Air Service Group in the 9th Air Force, who are commended for outstanding performance of duty during the period September 1 to November 15, 1942.

The citation reads: "During this period, these units by their untiring devotion to duty under the most trying conditions of the heat and sandstorms of the Egyptian desert made possible the active participation of the American Army Air Force units in the Middle East Theatre in the major battle then formulated. The preparation of our air forces in the major engagements during this period and their successes were made possible by the prompt and efficient manner in which these units were able to unload, segregate, transport, store and issue the supplies and equipment necessary for the conduct of operations. Motor transportation equipment was prepared for the use and possession of combat units under field conditions rendering such work virtually impossible. This task was performed night and day during excessive heat, sandstorms and most adverse conditions. These units are to be commended greatly for their exceptionally meritorious contribution to the conduct of operations against the enemy."

A citation from the commanding general of the North African Strategical Air Force for Capt. A. L. Zachry of Atlanta, Ga., for completion of a difficult and dangerous motor convoy mission in North Africa, had this to say: "In spite of great difficulties presented by strange roads, faulty maps, lack of a guide and the presence of enemy troops in the area, you led this convoy into the airdrome in time to supply our fighters with the gasoline and ammunition needed for the first day of our operation there. The major part of our victory played by the fighting unit operating from this airdrome would have been impossible without the supplies which your efforts delivered, and I wish to commend you highly for completion of a dangerous job in an expedient manner. Your actions reflect credit upon yourself and the military service."



"Dammit—I said incendiary BOMBS!"

—JAMES T. RAWLS

Hotel De Gink For Women

To accommodate WASPs who come through ferrying planes, and visiting WACs on equally serious purpose, a separate hotel for women has been placed across the street from the Officers' Club at Morris Field, Charlotte, N. C. Under the leadership of Mrs. Warner B. Gates, wife of the CO of the field, the women's club was furnished and is being maintained. The small building consists of a lounge and reading room and six bedrooms. Funds to establish this Hotel De Gink for women were raised through parties and war bond auctions. The place has been virtually filled since the day it was opened. The bill is fifty cents a night.

From the Staging Area

"Winged Victory" is the title of the official Army Air Forces stage show now having its dry runs under the personal direction of the author, Moss Hart. The play will test hop in Boston, November

1. Regular missions start in New York November 18 at the 44th Street Theatre. At the moment all major Hollywood studios are bidding for picture rights. The TO consists of a number of stage, screen and radio personalities in the AAF. Eighty percent of the feminine contingent will consist of wives of Air Corps men. Altogether the show will use over 300 soldiers and five revolving stages. There will be a mock-up of a B-17 on the stage which may or may not fly, depending upon the amount of type of fuel used —by the audience.

From Red to Blue

The red border enclosing the insignia for all United States military aircraft has been replaced with a blue border. It seems that the red border, caught at a flash in air action, sometimes resembled the Japanese insignia. Several months ago a new type of insignia was adopted for United States planes. It consisted of the white star in a circular field of blue, with a white rectangle attached horizontally at the right and left of the circle. Now the blue border encloses the entire device.

AAF Song Book

If it isn't already in your back pocket, a trip to the nearest PX should get you next to the song book of the Army Air Forces, just published and being made available to PXs in two editions, one pocket size and the other a piano edition.

"Air Corps Airs" is the title and it boasts 78 different songs—words and music—from traditional Air Corps numbers, written by AAF personnel, to popular ones. The pocket edition includes blank pages for the boys who like to write their own lyrics.

The book, only one of its kind, wouldn't look bad in the Christmas stockings of the folks back home. All profits from its sale will go to the Army Air Forces Aid Society.

Songs Away

THE stories are making the rounds about Capt. John Hunter Pitts, minstrel boy of the South Pacific who chases the Jap with ballad and bomb.

From what we hear, the latent talents of this heavy bomber pilot with the 13th Air Force first came to light on his initial hop over a Jap base. At that time he had never seen Zeros, never been in the searchlights nor experienced anti-aircraft fire. On this trip he got it all. When things were the hottest he made modest acknowledgement to the other planes on the mission.

"This is the radio program — 'I Was There' — starring John Hunter Pitts," he soberly announced.

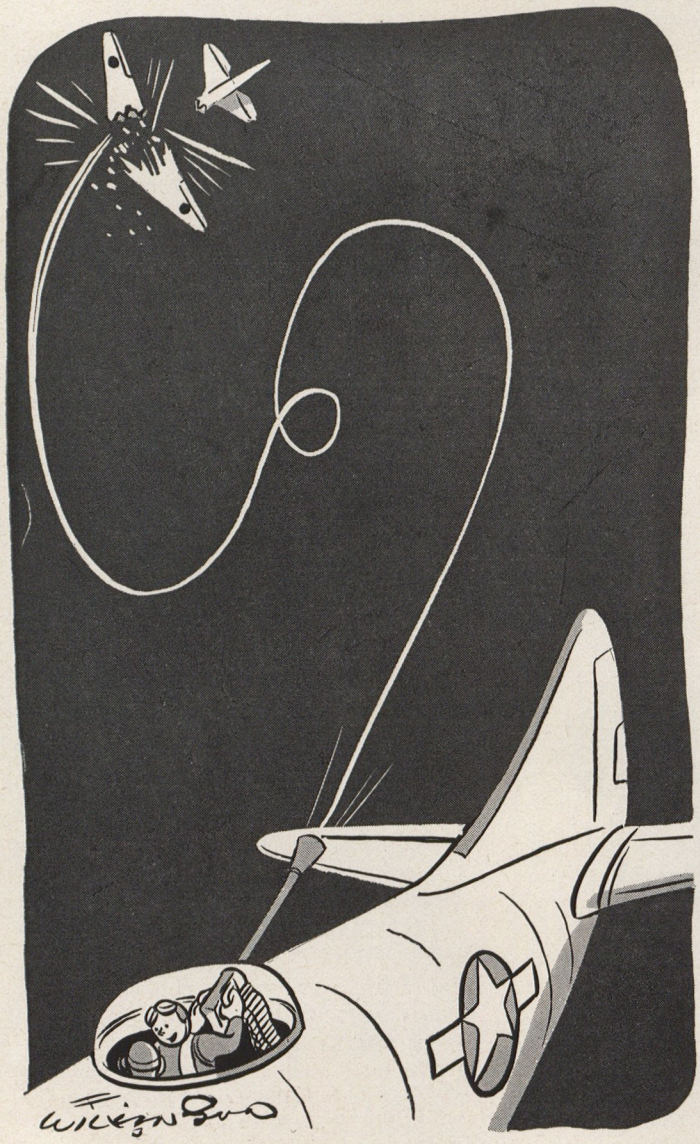
Another time, while going in for the bomb run, Captain Pitts' tail gunner shouted that a Jap searchlight had found the plane and was holding it in the beam. This, of course, came as no surprise to the captain who knew that ack-ack would soon be moving in on them. He believed, however, that he could complete the bombing run. "Wave at them, then take a bow," Captain Pitts instructed the tail gunner. A few seconds later the bombs plastered the target and the big plane pulled away unhurt.

On unescorted harassing missions the captain favors his crew with a program of rousingly appropriate music, usually featuring his loud, baying parody: "Harassing we will go, harassing we will go! Heigh ho, the merrio, harassing we will go!"

After concluding a foray, and having sung himself into a state of appetite, the captain turns his attention to the inner man. Some sixty miles from home base he calls in to the cook.

"This is John Hunter Pitts returning," he says. "Please put the pancakes on."

At last report Captain Pitts, who hails from Phoenix, Ariz., had chalked up 70 combat missions and 403 combat hours. And that represents a lot of singing.



"I magnetize the bullets."

—FRITZ WILKINSON

No Box Tops

THERE will always be a lingering doubt that some radio announcers are not as exercised as they sound over their wares, although John N. Dunham, formerly with Station WBBM sold himself a well-known product. As the commercial announcer for the Air Corps recruiting campaign he lasted through six programs, then enlisted. Cadet Dunham is now in his final training phase at a two-engine pilot school.

Join the Party

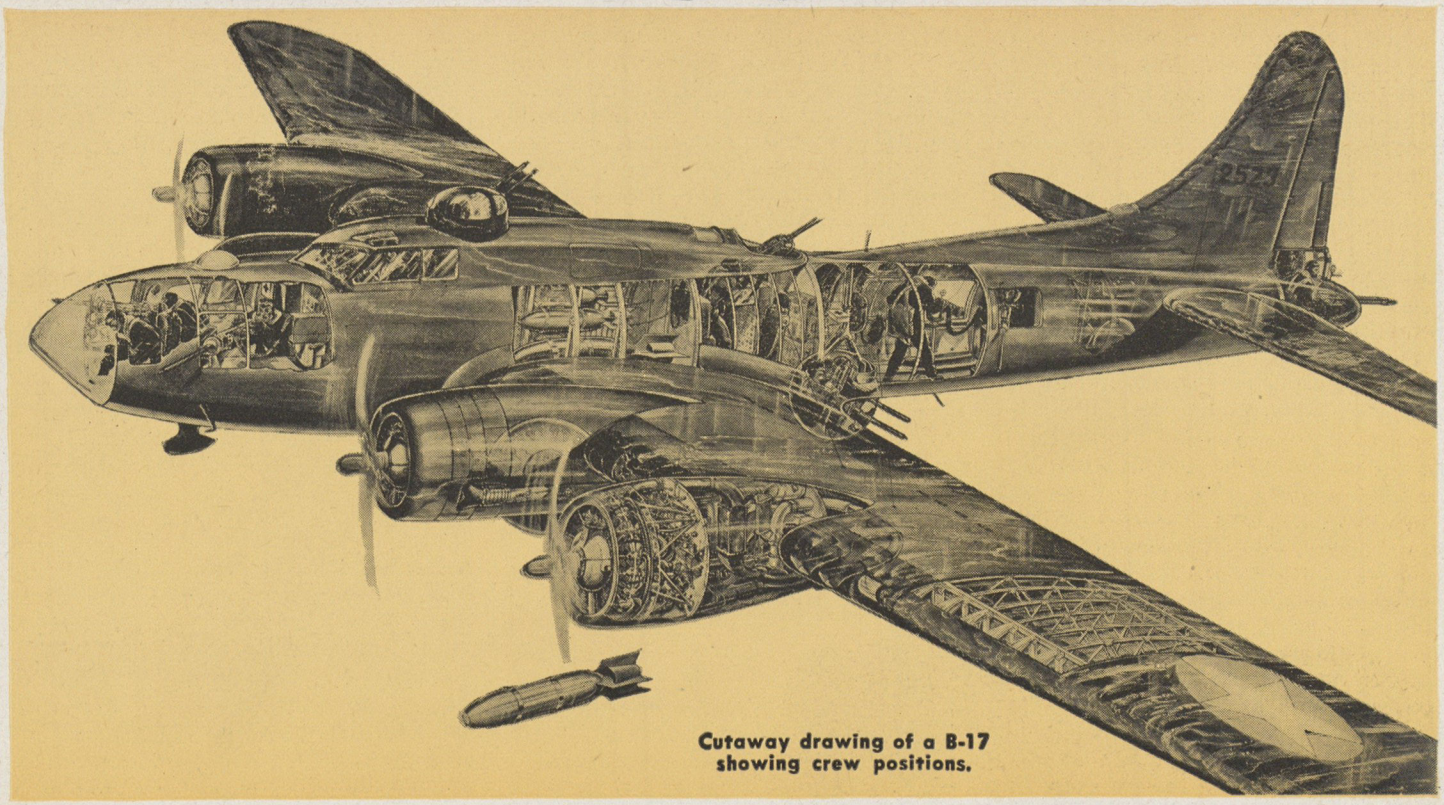
AAF men everywhere are invited to tune in on the annual Army-Notre Dame football rally to be held at the Hotel Commodore, New York City, on November 5, eve of the traditional game. The rally will be carried on a national hookup from 2100 to 2130 (EWT), and the time of broadcast to men overseas will be announced by short-wave two weeks before the event. This program will include special messages from ranking AAF officers and sport and stage celebrities. The Army Air Forces Aid Society will share in receipts of the rally.

Navigation Instructor's School

A NEW central instructor's school where rated aerial navigators will learn the technique of teaching navigation cadets has been established at Mather Field, Calif. This school is the first of its kind to give instructor training to navigators in the United States.

After completing the four-week course, instructors will be assigned to the navigation schools of the AAF Training Command to teach aviation cadets how to take the planes out and bring them back. Navigators who have been overseas will be brought up to date on recent developments, while the navigators as yet untried in combat will receive the benefit of the veterans' experience. —THE EDITOR

AIR DISCIPLINE



Cutaway drawing of a B-17 showing crew positions.

By Brig. Gen. Frank A. Armstrong, Jr.

FORMER GROUP CO, 8TH BOMBER COMMAND

THERE are no Sunday rides on a bombing mission from England. You work every mile of the way.

It is often hard for new men to understand what lies before them in combat. They come to us like rookies from the minor leagues, wondering and sometimes grousing about the hard work and the discipline. Then they go into action.

Something very definite happens to a man once he has been in combat. The clown of the crew is still the clown, and the men are still full of excitement, but something has changed inside them. The missions seem to take on a new meaning. A deadly seriousness becomes apparent.

The first three missions are the hardest for every aircrew—like a team playing for the championship after weeks of practice games. For the first time the crew is on the spot. The team is confronted by a very real challenge, and has its first chance to prove that its equipment and training are good. The chance also is at hand to see just how good the enemy is.

And no matter how many combat hours a man stacks up, he learns something on every mission, something new and important, since no flights are alike. If he doesn't learn on each mission he had better stop flying and check himself before he stops through no choice of his own.

Of all the many factors involved, nothing is more important than air discipline.

Air discipline is more than a phrase. It is a form of conduct that has as its foundation the complete dependence of one crew member upon another, of plane upon plane, squadron upon squadron, group upon group. In its present wide-scale application it is something new in the military, an outgrowth of mass aerial attacks. It is a symbol of both offensive and defensive strength.

In combat you must have something more than good equipment, personal skill and the courage and will to fight.

Air discipline starts on the ground, with soldiering, and continues in ground school. It takes on new meaning when you first realize the practicality of obeying the rules of combat flying and the consequences of disobeying them. If you can't discipline a man on the ground you surely can't in the air.

Discipline in the air is the antithesis of the so-called tradition that flying is an independent, somewhat carefree, operation. In combat, the "wild blue yonder" is far less wild when men and planes stick together.

It is sometimes hard for young officers to grasp the meaning of air discipline. They feel they know their jobs, know their equipment, and have confidence in both. But let them knock around in combat with heavy bombers and they'll learn that good equipment and skill are not enough. And I will throw in courage and the will to fight for good measure. Something more is needed. That something we call air discipline.

Perhaps the first thing to be learned is that we are flying bombers and not fighter-bombers, no matter what you may read in the papers. Our aim is to get to the target, drop the maximum number of bombs, and get home again so we can prepare to drop more bombs. We fight through necessity, not through choice. Under no circumstances on a bombing mission do we leave our prescribed course to find enemy planes. There is not a man among us who wouldn't like to take every crack he can at the Hun. But our cracks

come in bombs. Bullets are only a means to an end.

Formation flying is air discipline applied. Its overall objective—maximum striking power with maximum protective power—is always the same. Its method of application is constantly in a state of flux. The enemy tries something new and we counter. When he switches his attack we're all set to change our defense. We can be likened to a catcher and an infield on the alert for a bunt.

WE fly a fairly tight formation, but each bomber is assigned a block of air within which he may maneuver and alter his speed and altitude depending on the situation and the type of attack. It is vital that each pilot understand how much freedom he is allowed and how far he can go without stepping out of formation.

When a plane drops out, it not only jeopardizes its own position but takes twelve guns away from the formation. And when a plane is shot up and starts falling behind we have to let it go. We can't send more planes to stick with it. That would weaken our main effort. It's not easy to continue on your way when you see a ship drop out and know that enemy fighters swarm over a straggler like ants on a fallen sparrow. We do everything we possibly can to save every ship and bring them all back, but air discipline demands that we protect the group.

Knowing that we bomb as a group, the enemy tries to knock down the lead plane. He thinks that is his best bet. But to date the Hun has never turned back a formation. We don't turn back! And we don't jettison bombs—no matter what happens.

The lead bombardier sights for range and deflection and the other planes follow his run. But every bombardier in the formation sets the data in his bombsight. He must be ready to take over in the event something goes wrong with the lead plane or his own ship is knocked out of formation.

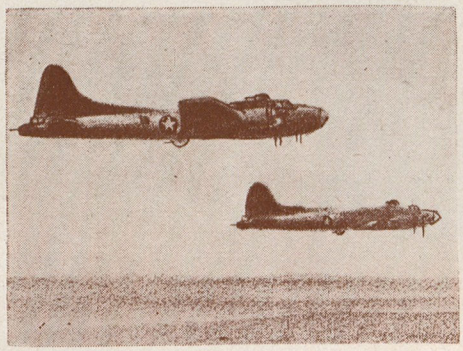
During a bombing run, when the success of the whole mission depends on what is accomplished in a two- or three-minute interval, there is no time for formality or for recognition of rank. When the bombardier takes over the ship for the run on the target he is in command. I don't care what the relative rank between pilot and bombardier, the bombardier tells the pilot what he wants done. And he doesn't stand on any of the niceties of military etiquette. The bombardier *tells* him.

There may be other occasions when the pilot is so guided by another man's judgment, when he virtually relinquishes command of the plane for a brief period. But the pilot is always the captain of the ship. And yet, except when some vital decision is to be made, it is seldom necessary for the captain to exert his authority. The authority is his and the men know it.

He is the man responsible for nine other lives and for an expensive piece of equipment. Pilots should always be on their way to becoming squadron COs, and I can't think of a more important job. The first prerequisite of a good CO is being so good as a pilot that the rest of the squadron trusts him implicitly.

A pilot can be a good CO and still be congenial, a regular guy. You can command respect from your men and yet live with them and be one of them. You can't be too lenient and you can't be too hard. Above everything, you must have their welfare at heart. When they know how you feel about them they will give you the maximum support.

That understanding between captain and crew is part and parcel of the relationship between one crew member and another, between a group of specialists pooling their efforts in a single job.



Every man on the plane should know the duties of every other man. I've seen a navigator and top-turret gunner bring a plane in together. The pilot was wounded and couldn't use his arms. The co-pilot was knocked out. So the navigator slipped into the co-pilot's seat and handled the controls; the top-turret gunner worked the throttles; the pilot gave them advice. Between the three of them, they brought the ship in.

Air discipline is essential in gunnery, for in a bomber it is necessary for every man, regardless of his position, to know how to handle the guns.

Gunners are instructed to cover certain fields of fire. This procedure is carefully worked out according to the place of the individual planes in the formation and is designed to bring the maximum number of guns to bear in every position. No matter how certain a gunner is of getting an enemy plane, no matter how badly he wants that plane, he must discipline himself not to swing his gun out of the line of fire he is instructed to cover. It may mean that he has to pass on a sure kill to another gunner, but, more important, it means protection against another enemy ship slipping in at an uncovered angle.

Each man should be proud of his own work and should feel he is an essential part of every operation. During the early days of our bombing missions over Europe, we showed the pictures of the results of bombing raids only to the pilots and bombardiers. But soon we realized that each member of our air and ground crews was a part of every raid and had a right to see the pictures. We posted photographs in squadron dayrooms. We displayed pictures of aerial combat, too. Now each man can view the results of his work, can profit by his errors and feel a personal satisfaction in a job well done.

Perhaps the best insurance for air discipline among crew members is the fact that a man who is undisciplined is unliked. Discipline and popularity go hand in hand, in a very practical way. An undisciplined man will fail to carry out his specific duties and will jeopardize the other members of the crew. And the other men know it.

THUS, discipline breeds comradeship, best illustrated, perhaps, in the talking that goes on over the interphone. And there should be plenty of interphone chatter, except when a vital piece of information is to be exchanged or when the plane is over the target. Not only is it good for morale but it serves as a means of keeping crewmen alert, as a check in determining whether crew members are all right, and as a quick method of relaying information on enemy fighter attacks and anti-aircraft fire.

To associate discipline with informality, comradeship, a leveling of rank, and at times a shift in actual command away from the leader, may seem paradoxical. Certainly, it isn't down the military groove, but it is discipline just the same—and the kind of discipline that brings success in the air.

I firmly believe that if you fly and fight intelligently—the way the people in the theatre teach you to fly—and if you observe air discipline, your only serious trouble will come through bad luck. You can be hit crossing the street when you're in the correct zone and the light is with you. It won't be your fault but it can happen. That, to me, comes under the heading of bad luck.

But a lot of so-called bad luck is due to lack of alertness—or a relaxing of air discipline. There can be no letdown over enemy territory, or even near home base on a return from a mission. Occasionally, when returning from long flights, we do what we can to make ourselves comfortable, such as dropping to an altitude where we can stop using oxygen. But in such cases, it is folly to relax. Combat crews must be disciplined to remain alert until they step from their ships on the home field.

Discipline in the air isn't easy. It means a long, hard grind all the way. But it means successful bombing, and no grind is too long and hard for that. ☆

'Poisonality'—A STRAGGLER

By FIRST LIEUT. JAMES J. MAGINNIS
8TH AIR FORCE

This is the story of a straggler as the pilot tells it—the routine operations report he turned in on the B-17 "Poisonality" which limped back to Britain after a raid on the Fiesler aircraft factories at Kassel, Germany. As mass daylight raids over the Continent continue, it is the type of story other pilots tell about stragglers—the bombers which are forced out of formation to return home on their own or go down fighting.—THE EDITOR.

WE took off on a flight to Germany, flying in the second element of the high squadron of the high group in a three group combat wing. We formed and ascended without trouble and saw a few fighters and a little flak as we crossed the coast going in.

Things went well until forty minutes from the target when the manifold pressure on No. 4 engine suddenly dropped to twelve and stayed there. We manipulated turbo control, throttle, mixture, rpm and cowl flaps, but could get no rise from the turbo. It was quite evident that either the turbo regulator or the turbo itself was gone. The engine was left running since it wasn't holding us back too much, and a feathered engine is always an invitation to enemy fighters. We determined to reach the target so long as they didn't cause us to lose the formation.

At this time Sergeant McCurdy, the left waist gunner, reported that the flaps had crept down four to five inches. This was indicated in the cockpit but the flaps would not retract electrically. The waist gunner was ordered to crank them up and bind the handle in place. This was done, though the flaps remained slightly down.

We stayed with the formation on three engines until about ten minutes before the target when No. 4 engine began to throw oil and smoke very badly. At this point, we feathered it.

The target was reached OK and our bombs were dropped from close formation. With the help of Second Lieut. William J. Holloway, the navigator, the turns from the target and rally point were anticipated and utilized to keep us in close to the formation.

Right after the target we began totalling the gas and found the greatest amount was 95 gallons in No. 4 tank. It was evident we would have entirely too little gas to complete the mission as scheduled. Tech. Sgt. William A. Glenn, the top turret gunner, was ordered to transfer fuel from No. 4 to No. 1 tank since No. 1 was the lowest. He set the fuel transfer valves and pump but after fifteen minutes it was evident that no gas was leaving No. 4 tank. The pump fuse was checked and found OK. No hand transfer pump was installed.

It was necessary to use full power all the way out to stay with the formation in its evasive action against flak. When possible we climbed up into the high squadron on the inside of turns, and when necessary we dropped down into the lead or low squadron on the outside of turns.

Then as we approached the coast, No. 1 began cutting out for lack of gas causing us to drop behind the formation. We dove to try and catch the low squadron, and at this time I first heard the plane being peppered with bullets and shells. We could not catch the low squadron so I dove for the group below us.

An explosive shell hit the oxygen, throwing splinters into pilot and co-pilot, filling the cockpit with smoke and dust a starting a fire. Although not wounded, Lieutenant Holloway and Second Lieut. Edward C. Piech, the bombardier, were knocked down and stunned. The co-pilot put the fire out with a fire extinguisher. Simultaneously, the bomb bay doors swung open, the flaps went down one-third, and No. 1 engine stopped putting out and was feathered.

I started diving at 250-300 mph and over 6,000 feet per minute, taking evasive action, while heading for a layer of strato cumulus clouds at 5,000. Near the cloud layer, with No. 1 and No. 4 engines feathered, orders were given to prepare for ditching. In the cloud layer a course of 275 degrees was taken and soon No. 3 engine ran out of gas and was feathered. Altitude was lost to 3,000 feet, where we broke out below the cloud. The fighters had left us.

No. 4 engine was unfeathered and was found to put out full power but no turbo boost. Airspeed was kept at 110-120 to maintain 3,000 feet altitude. All preparations had been made for ditching. SOS's and QDM's were going out OK. Sergeant McCurdy, badly wounded, was in the radio room being treated.

We sighted the English coast about ten miles ahead. As we crossed the coast at 3,000 feet, No. 2 engine began to falter, and soon thereafter was feathered. That left No. 4 doing all the work.

A few miles inland we spotted an airport under construction. We examined the control cables and surfaces and found them satisfactory for any landing. The wheels were put down, and we stayed between the coast and airport so a ditching or beach landing could be made if wheels fully or partially failed to extend.

Two of the three runways had large obstructions on them but the third had only minor obstructions such as barrels and bales of wire. The wheels and tires were down and checked, so an approach was made with the crew in position for crash landing. The landing was made and immediately the right tire began to get flat. The ship was kept on the runway with left brake and No. 4 engine, the only unfeathered engine. About thirty gallons of gas were left in No. 4.

Perfect cooperation was achieved by the whole crew. Every man did his assigned job throughout and all obeyed orders quickly and accurately.

In the few minutes of running fight Sergeant Reeder, the tail gunner, shot down two enemy fighters; Sergeant Long, the ball turret gunner, shot down another, and Sergeant McCurdy a fourth after he had received his mortal wound. ☆

Lieutenant Maginnis' report is fairly complete, but it does not reveal that "Poisonality" was so badly shot up by enemy fighters that it could not be repaired. It does not say that everything movable in the B-17 was jettisoned and that besides the fatally-wounded left waist gunner four other members of the crew, including Lieutenant Maginnis, were struck by 20 mm shell fragments. The others were Second Lieut. Roy H. Peterson, co-pilot; Sgt. Daniel J. Reeder, tail gunner, and Sgt. Angelo J. Riccardi, right waist gunner. Other crew members not previously mentioned by name were Tech. Sgt. William A. Harvey, radio operator, and Staff Sgt. Verl P. Long, ball turret gunner.—THE EDITOR.


ATTACK

ON PLOESTI

At a base in North Africa several months ago, Maj. Gen. Lewis Brereton, commanding general of the 9th U. S. Air Force, called together his group commanders, leaders and deputy leaders. It was more than just an ordinary meeting. The talk he gave them might well be called one of the most significant of the war. General Brereton said, in part:

"As most of you know, the 9th U. S. Air Force has been charged with the destruction of the Rumanian oil refineries . . .

"This task will be accomplished by one zero altitude attack with every B-24 that can fly to Ploesti and return . . .

"German armies on the Russian front and the German and Italian armies fighting our own troops in Italy are almost entirely dependent upon Rumanian oil . . .

"The sudden, complete and permanent denial of Rumanian oil will inevitably result in the collapse of German hope for a successful offensive against Russia and a successful defense against our invasion of Italy . . .

"The complete destruction of Rumanian oil refineries this month, with follow-up attacks against other related objectives, might well bring an end to the European war six months to a year earlier than can otherwise be anticipated . . .

"Time is of the essence. We must do this job now that Germany has committed her troops to an offensive in Russia and a vigorous defensive in Italy . . .

"The piecemeal destruction of the Rumanian refineries will not have the desired effect. Destruction must be complete and final. Our force, led by you men, must sweep clean the Rumanian oil industry.

"You have been assigned a task that could not be accomplished by a dozen ground divisions in a period of months. You men must do the job virtually in one day . . .

"No more important task has been ever assigned one striking force."

On these and following pages AIR FORCE presents information on various factors of the Ploesti mission, illustrated by photographs taken during the attack from the low-flying bombers. —THE EDITOR.

PLANNING THE MISSION

By Col. J. E. SMART

HEADQUARTERS, ARMY AIR FORCES

THE Ploesti attack, carried out by 177 B-24s on August 1, differed from other operations in many particulars. Most significant, perhaps, is the fact that heavy bombardment aircraft were employed to make zero-altitude precision attacks upon well-defended objectives. But it is also significant that the operation was conceived and planned in detail in Headquarters, Army Air Forces, rather than in the field, as is normally the case. Its subsequent development had the assistance of agencies of the 8th Air Force, the 9th Air Force and the RAF.

Thus, while the commanding general, 9th Air Force, alone was responsible for its conduct, the mission had the fullest possible degree of preparation from both intelligence and training aspects.

A history of the operation begins many months ago.

Allied industrial experts knew well the vital points and bottlenecks of Axis fuel production and refining. The Ploesti area of Rumania loomed large in their calculations. There—around the cities of Ploesti itself, around Campina, twenty miles to the northwest, and Brazil, five miles south—were located that nation's major oil refineries. This area refined all Rumanian crude oil—approximately a third of the total used by the Axis. It also accounted for all the Rumanian cracking capacity.

General Arnold's staff drew up a plan envisaging the destruction of these refineries by a low-level attack involving B-24 type aircraft based in North Africa.

The plan was then presented to the Combined Chiefs of Staff. After obtaining the views and recommendations of the commanding general, Allied Forces, Mediterranean Theatre of Operations, they directed that the proposed operation be carried out at such time as to interfere least with the invasion of Sicily and permit adequate training and preparation. It was further directed that two B-24 groups based in the United Kingdom and one in the United States be sent to the Mediterranean theatre for participation in the raid.

Conduct of the operations was assigned to the commanding general of the 9th Air Force.

While the original plan designated a low-level attack, the planning and operational members of General Brereton's staff made a further study. They examined the possibilities of both high and low-level attack. They estimated the relative degrees of success that might be expected, the probable and possible losses, and the predictable advantages of both.

General Brereton, after considering this data, decided that the initial attack would be made at low level with all available aircraft.

Following this decision, there were assembled in the 9th Air Force specialists in intelligence, low-level operations, weather, communications, navigation, material, armor and armament peculiar to the B-24, draftsmen, artists, architects and other personnel.

THE Commanding General, Army Air Forces, prepared the broad, basic plan; collected and prepared intelligence data, especially that obtained from petroleum technicians with first-hand knowledge of Ploesti targets; studied the availability of forces and consequent loss to other undertakings by diversion of personnel; arranged for the manufacture, procurement and shipment of low-altitude bombing sights with mount for B-24 aircraft; ordered the procurement and shipment of special delay action fuzes; transferred certain specialist personnel, and handled the procurement and transfer of sufficient aircraft and combat crews to bring each of five groups up to their required strength.

To the overseas commands went responsibility for execution of specific training and supplemental intelligence functions.

Much credit for success of the raid must go to the 8th Air Force and the RAF.

It was the commanding general, 8th Air Force, who conducted tests to demonstrate the practicability of the low-level attack en masse.

The flying technique finally decided upon for the mission was largely shaped by the results of those tests.

Further, the commanding general, 8th Air Force, trained in low-level bombing all combat crew personnel of one bombardment wing, prepared target folders, aids to navigation and other material.

The Chief of Air Staff, RAF, made available all intelligence and operational personnel and facilities of the Air Ministry, constructed scale models of the Ploesti targets and vicinity, helped in the making of motion pictures for the briefing of crews, and provided mechanical aids to navigation for some of our aircraft.

The RAF in the Middle East assigned operational and intelligence specialists, assisted in the briefing and indoctrination of crews, and furnished data on the enemy's use of smoke screens and other

High-lighted by flames and silhouetted against the dense smoke, a B-24 (left) flies low over the burning Astra Romana Orien refinery during the Ploesti attack.

ATTACK ON PLOESTI

Bombers head home, leaving the blazing refineries behind.

factors affecting success of the mission.

Among the functions of the 9th Bomber Command were the adaption of detailed plans for bomb loading; the drawing up of routes to and from the target, the approach, attack, withdrawal, timing and related tasks; the construction of dummy scale targets and the conduct of simulated coordinated attacks against them; the supervision of all training; the instruction of crews, and the distribution of target and briefing data.

THESE vast preparations, quickly described, took months for actual accomplishment. Even when the B-24 groups were completely equipped and assembled in North Africa, there were arduous days of training, days in which crews learned to fly their heavy ships just a few feet off the ground for miles and miles, to acquire navigational skill to find and bomb life-size dummy targets with a rare degree of coordination and accuracy.

Clearly, the B-24 was not designed for extremely low work. The crews, however, practiced bombing the dummy installations until no more than sixty seconds elapsed from the time the first bomb dropped by the first plane hit the target until the last one from the last plane struck.

August 1 was chosen as D-Day and the attack was carried out in accordance with Field Order No. 58 of the 9th Bomber Command.

One hundred and seventy-seven B-24s departed from their base. They flew a route designed from the standpoint of both direction and height to avoid all known enemy detecting devices. The height varied, of course. At times the ships were at an altitude of 10,000 feet. But the approach to the Ploesti area and the actual bombings were made at tree-top levels which can only be appreciated by examination of photos taken on the mission.

It should be emphasized here that the intelligence data furnished at Headquarters and other commands proved highly accurate. Furthermore, where photographs were not available, artists had drawn pictures of the target and of points along the route which pilots and navigators found extremely helpful.

Despite this, some trouble was encountered. Col. Jack Wood, for example, led one group of B-24s against Campina. This group of refineries lay in a valley with a slope toward the southeast. The plan was for his planes to come in for a downhill run from northwest to southeast. He was supposed to fly low up one valley, hop a ridge, turn down another valley and hit the target.

Upon arrival at the base of the mountains, he found the tops of the mountains covered with clouds, which made it difficult to find recognition points. He picked a likely looking valley, made his run and went over the ridge. He found it was the wrong ridge.

Wood then turned, flew his planes back up another valley and made a second run. This time they found the target and completely wiped it out.

Other planes from other groups had similar difficulties. Our losses on the raid were quite high. Nonetheless, of the 177 aircraft departing their base, an impressive number reached the target, attacked it with devastating force and wrought a destruction so enormous that it must seriously impair the working of the Axis military machine.

'. . . Conspicuous Gallantry'

The Medal of Honor has been awarded to two colonels who led separate elements in the August 1 attack on Ploesti, marking the first time this nation's highest award has gone to two participants in the same military mission. The recipients of the Medal are Col. Leon W. Johnson of Moline, Kan., and Col. John R. Kane of Shreveport, La., who were cited for almost parallel acts of valor.

While proceeding to their targets on this 2,400-mile raid both elements led by Colonels Johnson and Kane became separated from leading units in the low-level attack when they encountered dangerous cumulus cloud formations over mountainous territory. Though temporarily lost, both colonels later brought their elements into contact and continued to the targets, completing their attacks without the advantage of surprise upon which the success and safety of the mission largely depended. Both officers carried out their attacks in the face of thoroughly alerted defenses, destructive anti-aircraft fire, enemy fighter planes and the imminent danger of exploding delayed-action bombs dropped by the previous element, oil fires and explosions and intense smoke which obscured the targets.

"By his gallant courage, brilliant leadership and superior flying skill," the citation read, "Colonel Johnson so led his formation as to totally destroy the important refining plants and installations which were the object of his mission. Colonel Johnson's personal contribution to the success of this historic raid and the conspicuous gallantry in action and intrepidity at the risk of his life above and beyond the call of duty demonstrated by him on this occasion constitute such deeds of valor and distinguished service as have during our nation's history formed the finest traditions of our armed forces."

Colonel Kane's citation read: "By his gallant courage, brilliant leadership and superior flying skill he and the formation under his command successfully attacked this vast refinery so essential to our enemies' war effort.

"Through his conspicuous gallantry in this most hazardous action against the enemy and by his intrepidity at the risk of his life above and beyond the call of duty Colonel Kane personally contributed vitally to the success of this daring mission and thereby rendered most distinguished service in the furtherance of the defeat of our enemies."

OVER THE TARGET

By Capt. JOHN S. YOUNG
9TH AIR FORCE

YOU might say that the Ploesti oil refineries in Rumania were destroyed on the African desert, long before the real raid.

The actual attack on August 1 was only the continuation of a rehearsal which began six weeks earlier at our advanced bases in North Africa. A routine announcement was made that 177 B-24s would fly 2,400 miles for a low altitude precision attack. Our target: Ploesti's cracking, distillation and power plants.

We had already helped chase Rommel across Africa. Ours had been the first outfit to bomb Italy. We had hit Greece and Crete and we had hunted convoys all over the Mediterranean. But this raid was going to be different.

On previous missions, we had bombed whatever we could find. We had gone out with general instructions to find Rommel and give him hell. When we hit the European mainland, we had made a lot of saturation raids. But for the Ploesti mission, every plane in every element was given a pinpoint—and we had to find it. There were no secondary targets. Col. John R. (Killer) Kane, our group CO, was not being dramatic when he said, "Either we hit Ploesti or we'll die trying."

We examined hundreds of still photographs. We saw motion pictures taken from the air before the war, showing us exactly what the area would look like from our bombers. We attended lectures given by a former manager of one of the Ploesti plants. And we had a detailed relief map of the surrounding territory, complete with roads and even trees. Finally, a miniature model of the targets, drawn and constructed to an exact scale, was laid out on the desert and we practice bombed it for weeks.

We ran approximately twelve missions over that replica of the oil fields, approaching, attacking and departing exactly as we intended doing on the actual raid. Each element was given a specific dummy target which had been erected to resemble the real thing, and we practiced until we could bomb it in our sleep. When we finally did get over the real Ploesti, our movements were almost automatic. In a low altitude raid, you have to know precisely where you are going because you don't see your target until you are on top of it. And we knew we could only make one pass.

OUR Liberators were modified considerably for the mission. An extra releasable fuel tank was added in the bomb bay. The top turret guns in the lead planes were arranged so that they would fire forward, so the first ships could strafe the entire area, with the following planes protecting their rear. Extra fifties were mounted in the noses of the lead planes.

Five bomb groups made the raid. Colonel Kane and I were piloting the lead ship of the first element. The second group was on our right wing, a third on the left, another further to the left, and the fifth on the extreme left. We flew a flat V, wing tip to wing tip—no plane in the entire formation was more than 25 feet away from another plane.

We had forty-eight planes in our element, flying in sections of five. The first four sections had ten planes each, with an eight-plane section bringing up the rear. Each of the first twenty ships carried 1,000-pound bombs with sixty-minute delayed action fuzes. The sixty-minute fuzes were a precaution against premature explosions damaging the last planes over the target. In practice bombings, we got the entire flight across the target within a minute and fifteen seconds, but we were prepared for the possibility that some ships might get lost on the way and reach the target late. Each plane in the last three elements carried 500-pounders with 45-second delayed action fuzes.

Weather conditions were perfect when we took off at 0710. We crossed the Mediterranean at 2,000 feet. At our initial point we ran into thick cumulus clouds at 10,000 feet and lowering. Over Yugoslavia, the clouds started settling in and we had only about 1,000 feet of visibility over the 9,500-foot mountains. As we came into the Danube Valley, we dropped down to 2,500 feet and followed the Danube River to our target.

All the way across the Mediterranean and over part of occupied Europe, we

With storage tanks ablaze in background, bombers pass over cracking unit furnaces (A) and fractionating columns (B).

ATTACK ON PLOESTI

Smoke pots fired by the enemy obscured some of the targets.

didn't even see an enemy plane. It was like a practice mission but, naturally, we maintained radio silence. In that long ride, I don't think anybody said a word.

About 35 minutes from our target, we lowered to twenty feet off the ground. And I mean twenty feet. We were coming in so low our plane actually had to pull up to avoid hitting a man on a horse. That horse probably is still running.

The fun started when we spotted a freight train sided at a railroad junction. There must have been fifty cars full of oil just inviting our personal attention. Tech. Sgt. Fred Leard, our right waist gunner, and Sergeant Weckessler, top turret gunner, were mighty eager boys. They called Colonel Kane on the interphone and asked if they could "test" their guns. They had gone through a routine test just after we left the field and everything was in proper working order. But they wanted to make sure, and if a German oil train was sitting beneath them—well, that was just coincidental. The Colonel, never a man to object to a "routine" check, gave his approval and the "test" began.

All the other gunners decided that their guns needed a check, too—just to make sure they were working. It probably marked the first time in history that a routine gun inspection resulted in a Nazi train being blown right off its tracks.

About two miles from the target, the flak guns bellowed out a reception comparable to none I had seen in 330 combat hours against some heavily defended targets. Most of it was 20 mm stuff, with some 40 mm and a lot of machine guns. The fire was plenty accurate.

A mile and a half from the refineries, we opened up with our fifties aiming at the oil tanks which held about 55,000 gallons of oil. They started to explode, throwing smoke and flames about 500 feet into the air. There we were, buzzing in at twenty feet, doing 200 miles per hour, flying through intensive flak and bouncing around between oil fires. Play that on your harmonica sometime.

OUR particular targets were the Orion and Astra Romana refineries. They had smoke stacks about 210 feet high, so we had to climb to about 250 feet to drop our bombs. Flames were biting in through the bomb bay doors, the heavy smoke fires made visibility difficult, and the flak fire was beating a hellish tattoo all over our ship, but with all the practice under our belt we had no difficulty picking out our targets. We laid our bombs down the middle.

Forty of the 48 planes in our element got over the target. One cracked up on the take-off and seven others turned back with mechanical troubles. The rest of us didn't miss.

After the bombs were away, we dropped back to twenty feet and about fifty ME-109s and 110s jumped on us from the right. We were flying so low they couldn't dive on us, but they did lazy eights all over our formation and caused us plenty of trouble.

The housing around the propeller and three cylinders of our No. 4 engine were shot out. Two feet of the prop on the No. 1 engine was smashed, tearing a foot and a half hole in the left aileron. The motor was vibrating like a bucking bronco. And we had a wing cell leak in No. 3. We (I say "we" because Colonel Kane and I were both flying that airplane) put on ten degrees of flaps—no more. Ten degrees gives you the best lift without creating too much drag. We kept our wings straight by using the rudder, not the ailerons. Use of ailerons under those conditions is liable to drag a wing down.

We were still at twenty feet—maybe less. As a matter of fact, Lieut. R. B. Hubbard, our radio operator, called Colonel Kane and suggested that we get some altitude because we were collecting a mess of branches, leaves and cornstalks. The colonel investigated and I'll be damned if Hubbard didn't hand him a cornstalk!

The fighters kept coming in and we accounted for three. They attacked for about twenty minutes, and we just put the ship on the ground and ran like hell.

We muddled through the fighter attack, and staggered away from the target on two and a half engines. About 200 miles south of the refineries, we realized that we couldn't return over the Mediterranean with our battered ship. We decided to hug a land route going back. The chief topic of conversation was picking a good place to set her down. Everybody was pestering our navigator, Lieut. Norman Whalen. For my money he's the best in the business. He finally had to tell the colonel, "Look, if you guys will just leave me alone for awhile, maybe I'll find a field." We left him alone. Whalen was navigating for two other damaged planes which were following, and the three of us were being covered by Lieut. Royden LeBrecht. Nothing had happened to his ship.

We crossed an enemy airfield at 1,500 feet and the flak batteries opened up. I don't know who was more surprised. But we got away without trouble.

In order to gain altitude to cross a mountain range, we threw out everything that was movable. We released the extra gasoline tank and tossed out oxygen bottles, gas masks, ammunition, radio equipment and anything that a screwdriver could dismantle. I haven't yet seen the humor in LeBrecht's remark, but he called and inquired: "What the hell are you doing, redecorating?"

We finally got up to 6,600 feet, but we needed 7,000 feet to cross the mountains. By picking our way through canyons and ravines, and with some lucky updrafts, we managed to get over.

A portion of the flaming Colombia refinery, showing the boiler house (A) and power house (B).

The plane was hobbling along now at 130 miles per hour and we knew that it might stall around 125 mph. It was still flying, however, and we kept plugging along. We had a choice of putting her down on land or flying across open water to the nearest Allied landing field. The colonel and I realized that there was a good chance the ship would flop into the water, but we had come too far to worry about that. As we crossed the coast, Whelan gave us an ETA of 2110 for the selected airfield.

Whelan was on the nose to within a minute. Exactly fourteen hours and forty minutes after we left Africa, we let her down.

We had to crash land the plane, but nobody was hurt and the first thing I did after we got away from the ship was to kiss the navigator. Yes, I really kissed him.

A couple of days later we got back to our original base where Major Selvey had a dove and pheasant dinner waiting for us. Major Selvey is group materiel officer, and I suppose he figured that the banquet came under his department.

After the experience, I think I am in position to offer some advice to men who may go on a similar raid. The most important thing for you to do is learn formation flying to perfection. Even with a heavy bomber, you must be able to stay no more than 25 feet away from your wing man. You've probably been told before about flying tight formations. In combat, you do it or you don't come back.

Don't be afraid to hug the earth. A B-24 will fly ten feet off the ground and you'll find real safety down there. Practice evasive tactics until they come out of your ears. When the enemy peashooters attack, keep in a turn, increasing and decreasing that turn, and stay on the ground. Whatever you do, don't fly in a straight line. When a fighter climbs after his first pass, he has to look for you all over again. If you are flying straight, he'll be able to pick you out very easily.

All aerial engineers should practice the EXACT procedure for transferring gasoline. That can't be over-stressed. I think we lost a couple of planes on our raid due to the difficulty in making the proper transfer. Get rid of the gas in your bomb bay tanks as quickly as possible and transfer it to the wing tanks to avoid having a chance hit in the bomb bay blow you up.

When we returned I was asked the extent of damage we did to the Ploesti refineries. Naturally, that's hard to figure, but I can speak first hand of our particular targets, the Orion and Astra Romana refineries. The boys in our element agree that no German oil will come from them for quite some time. ☆

'Mission Accomplished'

The Ploesti mission proved once again that American bombers can carry out precision attacks on remote and seemingly invulnerable targets with the accuracy of a skilled surgeon guiding his knife.

Each bomb dropped had a particular address. The exact targets were selected meticulously, after months of planning, for their relative importance. The number of planes assigned to each individual target was gauged in proportion to its size and importance.

The refineries at which our airmen struck were in three groups—at Ploesti, at Campina and at Brazil. There are about forty refineries in the Ploesti area, of which two-thirds are obsolete and unimportant and were discarded as targets. Our main forces were concentrated on the large refineries and other installations in Ploesti, while other planes were dispersed to the plants on the outskirts.

Our planes singled out their objectives one by one and pulverized them with the precision of rifle fire.

The largest of the Ploesti refineries was the Astra Romana, important because of its large production of gasoline, one-third of all Rumania's production cracking processes. It is also the central receiving station for oil from most of the other refineries. It pumps all oil moved to the Giurgiu terminal of the pipeline on the Danube, over which it is moved to Germany.

We damaged its powerhouse sufficiently to put it out of operation, demolished its cracking installation and destroyed almost half its operational capacity.

The Steaua Romana refinery at Campina is a very modern plant with the most modern distillation equipment. It was wiped out.

We wiped out most of the vital parts of the Creditul Minier, which had large modern cracking equipment and an important aviation gasoline plant. It was erected only last year.

The Colombia refinery had a considerable proportion of cracking equipment. We destroyed most of its vital parts and cut its operational capacity in half.

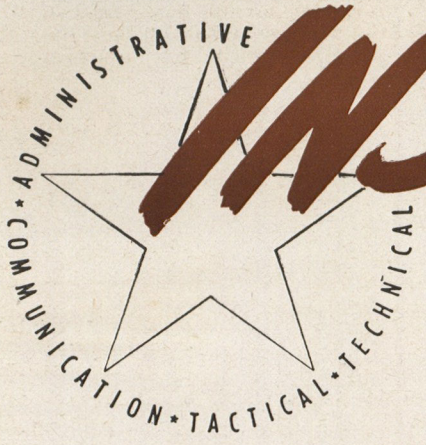
Half of the Phoenix Orion plant was obliterated.

These are but some of the plants we hit. Damage was wrought elsewhere. The bombs dropped included many of the delayed action type and it is certain that their detonations caused further havoc.

The effect of this mission on the German war effort cannot be immediately apparent. It must show in the vast curtailment of an essential source of the European Axis' oil supply, and in the enormous burden placed on the Axis transportation system. The latter involves the necessity of hauling crude oil from the Rumanian fields to refining plants far distant from the fields, and rehauling the refined product in many instances all the way back to Germany's Eastern front, to which the surviving refineries are not nearly so handy.

The effect must show in a strain throughout the entire German war machine through depletion of a vital resource, and in an ill-afforded burden of an extra handling operation imposed on the already overloaded rail transportation system.

PREPARE FOR INSPECTION



TIMELY ADVICE FROM THE AIR INSPECTOR

Matters presented here are informative only, and are not to be considered as directives.

WELL DRESSED FIGHTING MEN: What the well dressed soldier will wear overseas depends on you inspectors at showdown inspections after warning orders are issued in this country. Here are some points to keep in mind when checking clothing and equipment:

Trousers: Fair wear will usually show up at the bottom and back of legs, edge of pockets, fly or seat. Hold the trousers up to the light to check wear.

Coats: Be sure to look at the cuffs, edges of pockets and buttonholes.

Field Jackets: Inspect cuffs and collars at folds. Hold the cuffs and collars in both hands and apply pressure to determine serviceability.

Shirts: Check for frayed collars, and worn buttonholes, cuffs and elbows.

Shoes: Look over soles and heels, back stay, counter and insole. Close scrutiny will often reveal that the slip sole is torn away from the welt or that the back stay is split on the insole.

Leggins: Check for broken eyelets and worn straps, and stitching pulled out along seams.

Raincoats and Overshoes: Inspect for holes, cracks, cuts and the like. Look particularly for snaps that have pulled loose from the rubber or fabric.

Mess Gear: Be sure that the hook on the meat can cover is intact.

Field Equipment: Check buckles, snaps, straps and stitching.

TRAINING AIDS: Two publications which should bear the imprints of frequent thumbing by S-3s in the field are FM 21-6 and FM 21-7. The first is entitled "List of Publications for Training," and the second, "List of Training Films, Film Strips, and Film Bulletins."

The United States Army has the world's finest training aids, and it is up to S-3s to know what they are and to put them in service. To help S-3s with this work, The Air Inspector recommends a chart showing what manuals have been issued to organizations and activities, and how many additional ones are needed.

UNUSED EQUIPMENT: Inspectors, when you see crates of idle equipment stored in a warehouse, start asking questions. What is it? What is it used for? If you can't get the answers, open the crates. The equipment may be something that should be utilized on your base—or at another station. Purposes for which bases were designed sometimes change, and equipment for one type of organization no longer serviced may be merely gathering dust.

LIVE WIRE SIGNAL MEN: Add to reasons why Americans are defeating the Axis: The signal company of a service group starting its training at a western base had not yet received its switchboard. The company wanted to set up telephone service for the group *now,* so its commanding officer talked to the Base Signal Officer. Parts of a switchbooard—many of them old and badly worn—began to materialize from base supplies and from cast-off equipment of the local telephone company. After repairing the worn parts, the signal men put the various pieces together and soon had in operation an exchange that provided both service and training facilities. The best training, however, came from putting the switchboard together. The organization is now overseas with a new switchboard, and you can bet it will take a direct bomb hit to put it out of commission permanently.

GOOD-BYE, PETS: Overseas movement orders mean a parting of the ways for an organization and its mascot—duck, dog, cub bear or what have you. Don't show up at the port of embarkation with a spaniel wagging its tail among the luggage. Port officials have enough to do without disposing of assorted animals and fowl, not to mention pet goldfish.

PROTECTING MONEY OVERSEAS: Going overseas, soldier? Here is some information you will want on postal money orders when purchasing them for the protection of your personal funds:

Just have the postal money order drawn payable to a relative or to yourself at the United States post office at your home address or that of the relative. You can then hold the order for a year and still get it repaid to yourself as remitter at your APO or any other APO branch of the same United States post office. At any time, however, you can send the money order to the relative to whom it was originally made payable. If the order is issued showing you as payee also but is drawn on the post office at your home address in the United States, you can indorse it over to anyone you wish residing at the office on which the order is drawn. It can be cashed there for a period of one year from the last day of the month in which issued (WD Circ. 155, 1943).

GETTING TO THE BOTTOM OF SHOE PROBLEMS: Your feet are the ones that will hurt, soldier, not those of the inspector, if you arrive overseas with a pair of shoes having bad soles. Don't try to "get by" the inspector.

Some of you men lining up for show-

down inspections wear brightly polished shoes that are not serviceable and should be replaced. The shoes may on occasion be passed over by the inspecting officer, but fortunately for him he will not have to wear them. Although they feel comfortable on your feet now, they may worry you more than the enemy in rough country overseas.

AR 615-40 states that company or unit commanders will require squad leaders to make weekly inspections of shoes. But that doesn't mean that each man shouldn't check his own shoes daily.

Aids to keeping shoes in shape:

Frequent polishing.

Regular application of properly prepared lubricants (dubbin).

Avoidance of drying by direct contact with heat.

So far as practicable permitting natural drying.

No single pair of shoes should be worn on consecutive days. Alternate with a second pair.

SLEEVE PATCHES AID INSPECTORS: Inspectors, you now have a new aid in checking on malassignment of enlisted technical specialists. We are talking, of course, about the distinctive sleeve patches of men in job classifications of armament, communications, engineering, photography and weather, which are authorized by AAF Regulation 35-12.

Each man receives six patches to be worn on the outside sleeve of the coat, field jacket and shirt (when worn without the coat), and on the left breast pocket of the fatigue uniform. By noticing the sleeve patches of men at work on a base, the inspector can often tell at a glance whether they are properly assigned.

Overseas, these patches are particularly valuable as men can be picked quickly for jobs when rush calls are received.

☆ INSPECTING THE INSPECTOR

Are you checking to see that all references to "limited service" are deleted from service records of men retained on active service? (WD Cir. 161, 1943.)

☆ ☆ ☆

Do you know whether service records are accompanying all enlisted men transferred from your organization or station?

Is everything possible being done to speed up the submission of shortage lists in preparation for overseas movement?

☆ ☆ ☆

Do you give credit where it is due?

☆ ☆ ☆

Are you checking to see that long distance calls are being held to the minimum?

BOMBER TEAMWORK: "If it weren't for the tail gunner using the interphone to keep me posted on the formation behind, the top gunner reporting to me what he can see, the ball turret gunner telling me what he can see, it would be almost impossible for me to fly the airplane in combat. I can't get up and look around. Those fellows are my eyes."

In these words, Capt Robert K. Morgan, a pilot with a record of 25 successful bombing missions, pointed out the importance of teamwork for a bomber

AID FOR ALERTED UNITS

In keeping with his policy of passing on to other commands valuable practices observed in the course of inspections, The Air Inspector presents here an outline of the assistance program for alerted units organized by the base administrative inspector at Bradley Field, Conn.

To assist the base commander in carrying out his responsibilities to an alerted tactical unit, the base administrative inspector's office brings to the unit commanding officer advice and personnel aid whenever necessary.

Immediately upon learning that a unit has been alerted, an inspection is conducted to determine the status of the organization as regards training, supply, personnel, morale, etc. This might be called a preliminary POM inspection. Action is started to bring into play all the members of the base staff who can assist in preparing the unit for overseas movement. Such showdown inspections called for by warning or movement orders are made with the aid of the base S-4 and Quartermaster. Other base officers are expected to take the initiative in providing aid, with the work coordinated by the base administrative inspector to assure that all details outlined in POM are covered.

Accuracy of the records of the individual soldier is stressed, since any future benefits which may be due himself or his beneficiaries depend largely on those records. A special questionnaire covering some thirty points on personnel matters aids in checking and correcting service records and allied papers.

Dissemination of clothing and equipment lists makes the conduct of a complete showdown and preparation of shortage lists a much simpler and more accurate task. Displaying of marking posters in barracks speeds the accurate marking of individual clothing and equipment.

Of special aid to inspecting officers are loose-leaf binders (6 by 9 inches) containing extracts of pertinent regulations

and directives, maintained up-to-date and indexed for ready reference.

The base administrative inspector considers it a personal obligation to lift the morale of the enlisted man to the highest degree. The organization's furlough list is reviewed with the unit commanding officer, and men with overdue furloughs, especially those stationed a considerable distance from their homes, are encouraged to obtain the privilege of a trip home prior to overseas movement. Where time is short and distance is long, with monetary conditions permitting, the base administrative inspector recommends that the transportation office issue priorities for commercial airline travel.

In the final stages of an alerted unit's preparations, prior to the troop movement, the administrative inspector's office assists the organization by following through with the transportation department on the dispatching of household goods and boxing, crating and marking of equipment. The actual handling of the troop movement—consultation with the Traffic Control Division, Washington, D. C., set up of kitchen cars, etc.—is supervised by the administrative inspector's office to assure 100 per cent base cooperation.

Considered vitally important are the following general points:

Don't be cold and aloof when inspecting a unit. Close cooperation is needed from all concerned, and a highly critical attitude will not attain this result.

Maintain a genuine interest in the unit's welfare.

Be liberal with advice, but be sure it is based on information that is accurate and up-to-date.

Stimulate interest by individual contact, wherever possible, with the enlisted man actually making entries in records.

Don't be stingy with your time and energy, and each alerted unit which leaves your field will be confident and cheerful with the knowledge that everything humanly possible was done to bring the unit to a high state of efficiency.

☆ HERE ARE THE ANSWERS

Q. *Can rebuilt shoes be taken overseas?*

A. If the inspector at the showdown inspection decides the shoes are serviceable, they will go overseas. However, if they are found to be unserviceable, only Class A shoes will be issued as replacements (Par. 12c, AR 615-40).

☆ ☆ ☆

Q. *Does the requirement that the Individual Pay Record (Form 28) reflect up-to-date accurate pay data at all times mean that entries must be made for each monthly payment?*

A. No. The reference to "up-to-date" pay data means that all entries on Page 2 and 3 of the form will be accurate and complete. Only "casual payments" made to enlisted men while absent from their organizations need be entered in the form. Casual payments include partial payments or payments for a month or months made to enlisted men where separated from their organizations. It is no longer required that entry be made of the last payment to enlisted men preceding their transfer to another command (Letter, Headquarters, AAF, 1 July 1943).

☆ ☆ ☆

Q. *Does the reference in POM to the removal or obliteration of insignia before departure for a concentration area, a staging area or a port refer to the AAF shoulder patch?*

A. No. The shoulder patch remains. The directive refers to unit organizational insignia, not to Army Air Forces insignia.

Q. *Can an Army exchange call upon the post engineer to render services?*

A. Yes. When materials, supplies or equipment have been furnished, the exchange will pay promptly by check to the post engineer for the actual cost thereof, including cost of services (AGO WD Memo W210-17-43).

☆ ☆ ☆

Q. *What happens to athletic and recreational equipment purchased from WEMA funds when an organization is ordered overseas?*

A. It is turned in to the nearest post, camp or station prior to departure for a port of embarkation staging area (Memo S210-9-43, ASF, Office of The Adjutant General, 17 May 1943).

☆ ☆ ☆

Q. *If there is a conflict between POM and the overseas movement order, which governs?*

A. The movement order. POM is considered a part of the movement order.

crew. Tactical inspectors cannot emphasize this point too much. Working together on the interphone is only one phase of the necessary teamwork of a crew. Inspectors should check to be sure that crew members are becoming familiar with all jobs on a bomber.

Dividends in Bomber Raids: Technical inspectors, have you ever stopped to think when you read that 50 American bombers attacked a target in the Ruhr Valley or the Solomons that only 45 might have made that raid if you had not been doing your job? Or that 55 bombers might have participated in the raid if you had done a better job?

First and second echelon maintenance on planes and engines often pays dividends months later in combat.

This is just to remind you that too much stress cannot be placed on maintenance inspections—preflight, daily, 25- and 50-hour, etc.

104th Article of War: If you are stumped on some question regarding punishment under the 104th Article of War, look up AAF Memo 35-6, 17 July 1943. This memorandum discusses in detail the "do's and don't's" of punishment.

Pack Them Together: "Keep the parts of sets together in packing cases."

You will be glad you heeded this advice when you get overseas and start to assemble such items as an M1937 range. If the repair kit, the pans and the stove are in different cases, you may have a hot meal and you may not. Packing cases sometimes become widely separated on the trip between the States and battle zones.

Pass the Ammunition: In making ordnance inspections, here are some points to be checked:

Are oldest lots of ammunition being issued first?

Are sufficient copies of AR 775-10 available in the organization and are they being used?

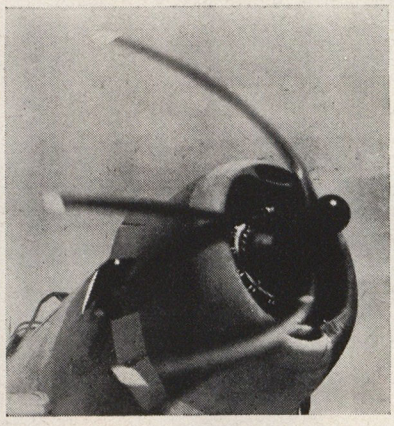
Are excess stocks of ammunition on hand, and if so, what has been done to eliminate them? They should be reported to the next higher headquarters for disposition.

Is every effort being made to salvage used cartridge cases, links and packing boxes? The salvaged items should be turned into the base ordnance officer for disposition. They should not be allowed to accumulate in the armament shop. ☆

Camera Acrobatics

Although gremlins are too quick to be caught by the camera, this shutter was fast enough to show what they might do to a turning prop. Believe it or not, this is a Hamilton Standard three-blade hydromatic propeller with aluminum alloy blades of conventional type.

The explanation is not a cyclonic gale that bent the blades like tree limbs. The effect is simply the result of a trick camera shot at Wright Field.



The picture of the propeller, which was turning counter-clockwise, was taken with a focal-plane shutter which exposed the image on the film from the bottom of the picture toward the top.

During the time the shutter slit or opening travelled completely across the picture, the propeller had turned through a considerable portion, probably one third, of a complete turn (120 degrees). In moving from the bottom to the top of the picture, the shutter opening first exposed the image of the tip of the lower blade in the lower left hand corner. As the shutter opening moved towards the center of the picture it continued exposing successive portions of the lower blade in positions more and more counter-clockwise.

When the shutter opening was in a position to expose the center of the picture it happened that the middle blade (in the picture) was horizontal and parallel to the slot. Hence the middle blade was exposed almost simultaneously throughout its entire length and did not move far during its brief exposure. It therefore appears practically straight.

The exposure of the image of the top blade started at the hub when the blade was to the right of center. As the shutter opening moved upward, the top blade moved counter-clockwise so that by the time the opening got to the top of the picture the image of the tip of the blade had moved into the upper lefthand corner of the picture. Intermediate portions of the blade were photographed in correspondingly intermediate radial and circular positions outward and counter-clockwise. ☆

DESTRUCTION BY PARACHUTE IN NEW GUINEA

As the battle in central New Guinea neared a climax, parachutes were playing their part in the Allied offensive. For the first time in the Southwest Pacific theatre, American paratroopers were dropped behind enemy lines to block the retreating Jap forces in the vicinity of Lae. Jumps were made successfully from a lower altitude than had ever before been attempted in such a combat maneuver. At the same time, other parachutes were falling on enemy airdromes—these supporting fragmentation bombs which blasted enemy aircraft on the ground and wrought havoc with base installations. Using this and other methods of low-level attack, American bombers were pounding Jap airfields with such regularity that the enemy defenders on the ground were almost completely without air support. In one attack on four airdromes in the Wewak area, more than 225 Jap planes were caught on the ground, many of them wing-to-wing; 120 were destroyed and a number of others severely damaged.

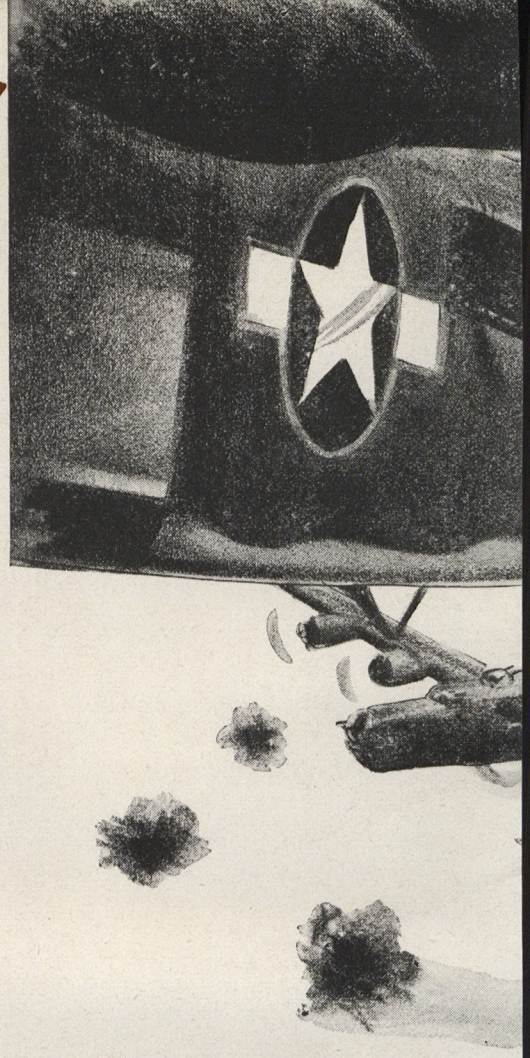
These chutes carry paratroopers and supplies dropped behind enemy lines near Lae. The smokescreen in the background conceals the operation from the Japs. Note the two AAF transports at upper left, which have unloaded their passengers in a string behind them.

Dangling from these chutes are fragmentation bombs, aimed at Jap planes caught on the ground at an airfield in the Wewa' area. Bombers come in at tree-top level in raids of this type.

BOMBS FOR PARAMUSHIRU

By Majors LOUIS C. BLAU and FRANK T. GASH
11TH AIR FORCE

How our Aleutian-based bombers drew first blood against the Jap stronghold on the northern approach to Tokyo.



ILLUSTRATED BY
CAPT. RAYMOND CREEKMORE

MAJOR BLAU was a co-pilot on the first mission against Paramushiru and led a flight on the second. Major Gash was a flight leader on the second mission.—THE EDITOR.

WHAT impressed everybody most about Paramushiru was the size of the targets.

Month after month we had bombed a thin rim of pinpoint targets around the curve of Kiska Harbor, but the army staging area on Paramushiru and the naval base on Shimushu Islands were duck soup. If your stick overshot a warehouse, it plunked right down in the middle of a barracks area. You could hardly miss hitting something.

When we first learned we were to take a crack at Paramushiru we were still so busy bombing Kiska that there was little time to make any special preparations. It was to be just another mission. The plan was to bomb Kiska on the way over, take on some more bombs at Attu, and after bombing Paramushiru, drop another load on Kiska on the way back. In that way we wouldn't waste any time or gasoline.

Our information about the island that was supposed to be a Japanese Gibraltar, guarding the northern approach to Tokyo, was meager. As a result, our first mission was for reconnaissance as much as anything else.

Still, there was an extra thrill in that take-off from Attu on July 19. The distance on the course plotted for the trip and return was only about 1,700 miles, not far as missions in the Aleutian area go. Whatever qualms we had over the lack of emergency landing spots between Attu and Paramushiru were compensated for by the thought that we were carrying the offensive to the enemy. It was our first crack at the Jap in his native haunts.

Our Liberators, loaded with 500-pound bombs, were in command of Maj. Robert E. Speer. The weather on the way over was mostly hazy, although occasionally it cleared to CAVU. We kept to about 3,000 feet and then climbed to about 12,000 as we approached the Kamchatka Peninsula. The peninsula is mountainous, somewhat like the Aleutians, but quite wooded. We rubbed our eyes at seeing a tree, some of us for the first time in a year. After following the coastline for awhile, we cut off for our run to the target.

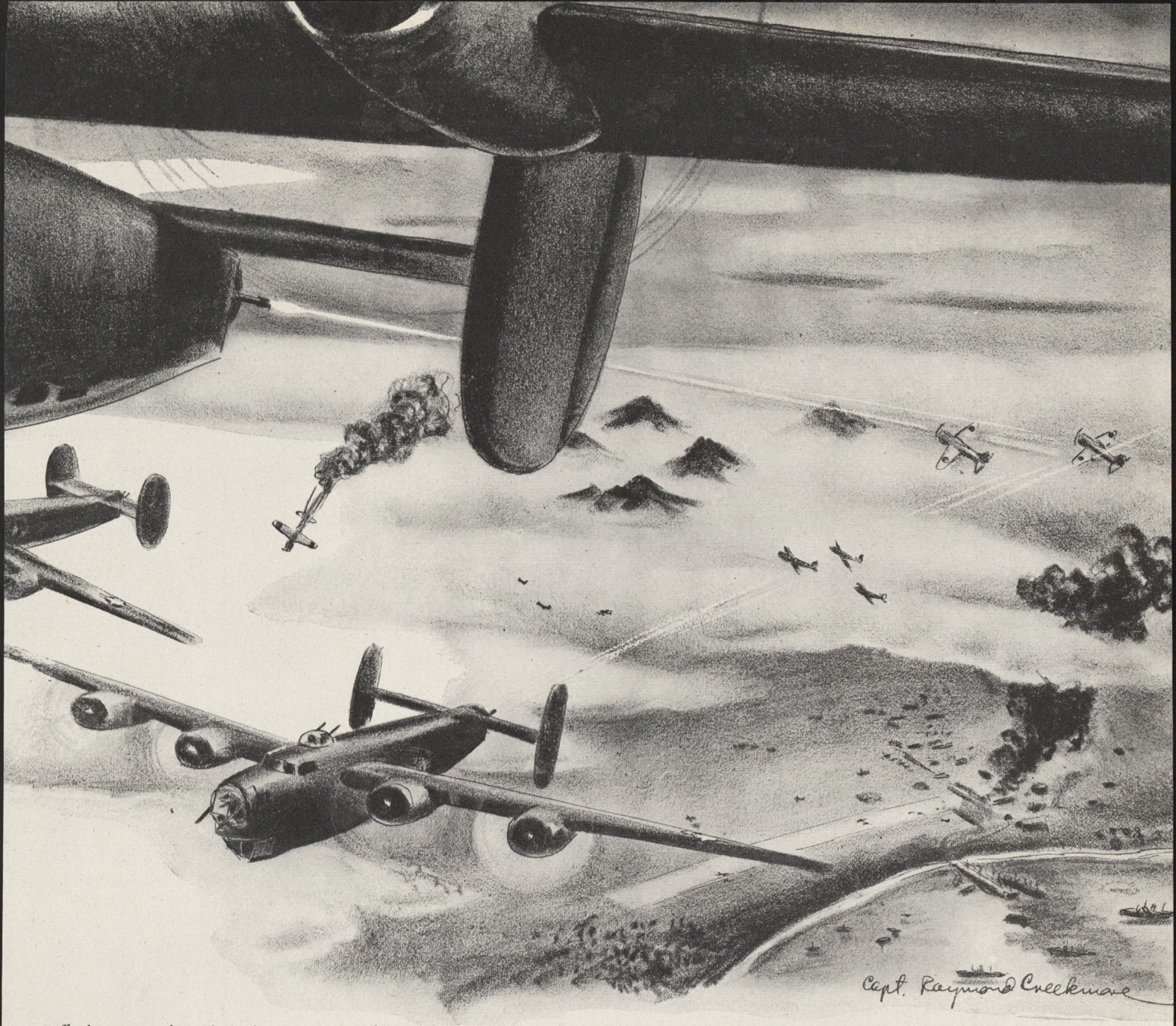
THIS first visit apparently was a complete surprise for the Japs. There was not a plane in the sky; none were even seen until after our bombing runs had been completed. Apparently not even the anti-aircraft was on the alert, because only four or five bursts were seen. Either they didn't have any more anti-aircraft set up or the crews were out for coffee.

As we approached, the clouds became broken and when we got over the target area visibility was good except for a low-lying haze which obscured the effect of the explosions. However, many excellent photographs were obtained and some smoke could be seen by the rear gunners.

One flight of three ships made a run at 18,000 feet attacking buildings in the vicinity of the airdrome near Kataoka. Another flight, through a misunderstanding of signals, dropped none of its bombs on the first run but had plenty of time to get away its entire load on a second run at about 17,000 feet, concentrating on shipping in the strait.

Many fishing and naval vessels and eight or nine large transports were observed in the strait. Several bombs were seen to drop close to these vessels, one of them scoring a near miss on a transport.

It was all over in less time than it takes to describe it. As we headed back home, five single-engine pursuit planes climbed up to intercept and two of about twenty float planes observed on Lake Bettobu, east of the naval base on Shimushu, got



off the water but their heart apparently wasn't in it. They gave up the chase within two or three minutes. The mission returned to Attu without a single bullet hole or so much as a scratch from anti-aircraft fire.

Our reception on the next trip, three weeks later, was quite different, to put it mildly. We bombed Kiska on our way over to the jumping off spot in the afternoon and everybody spent most of the night checking guns, motors, bomb racks and the thousand and one things that have to be looked after on any mission. We had a hunch the Japs might be waiting for us a second time.

With the aid of photographs obtained on the first mission we had a much better idea of our objectives when we took off through the early morning mist on August 11. In "A" flight were planes piloted by Major Gash, Lieut. Jerome J. Jones and Lieut. James R. Pottenger. Their target was the Kataoka naval base on Shimushu Island.

Making up "B" flight were planes piloted by Major Blau, Lieut. Robert Kammerer and Lieut. Robert Lockwood. Their target was the army staging area along the west coast of Kashawabara Bay. The planes of "C" flight were piloted by Capt. Irvin L. Wadlington, Capt. Harrell R. Hoffman and Lieut. Leon A. Smith. Their objective was shipping in Paramushiru Strait.

We cut down on the gas so each plane could carry a heavier bomb load. "A" and "B" flights also carried incendiary clusters.

Weather was CAVU most of the way over to the Kamchatka coast. We flew from 10,000 to 12,000, climbing to 18,500 as we turned south.

When we reached the tip of Kamchatka we found that both Paramushiru and Shimushu were overcast with a top of about 2,000 to 2,500 feet so we circled down to make a dead-reckoning run. After checking all stations over the interphone and finding everybody ready to go, all three elements headed for the target. Then we got a break.

The run is less than ten minutes. As we approached, the overcast became broken and we could see that over the targets the sky was clear enough to make a bombsight run as originally planned.

Then the No. 2 supercharger of Lieutenant Lockwood's plane went haywire and the No. 4 engine cut off altogether. He managed to feather the prop on his No. 4 engine but started to lag behind the other two ships of his flight. After coming all that distance, however, he didn't want to turn back without dropping his load, so he advised his flight leader he would keep course and make the best speed possible.

The second visit (Continued on Page 55)

LAST MATCH

By First Lieut. DAVID W. SMALLWOOD

As Told to Capt. Allen C. Rankin, Jr.
Headquarters, AAFEFTC, Maxwell Field

A MAN doesn't think much of his undershirt until it saves his life.

Mine under my flight jacket was cotton, the same kind I had bought for years back in my home town of Oxford, Miss. Besides, this undershirt was worn out and I gave it less than no thought at all as our B-18A lifted from the runway and dropped Anchorage, Alaska.

So long, Anchorage! We grinned from ear to ear—Lieut. Oscar Cook in the pilot's seat, myself beside him as co-pilot and the crew huddling exuberantly together in the rear. So we were going to escape, were we, if but momentarily, from Alaska's green firs, its white ice and deep blue water—and its silence? We thought we were.

I had put the memory of a year in the Aleutians and the vivid mental picture of two bomber crashes behind me. Now, I thought about nothing but getting home.

All day our two ships, being ferried back in exchange for new ones, held their formation. Like two geese, we roared along over waste and water and ice in a dead straight line for home.

More of the same the next day. It was bright noon and we still roared along, Maj. Kenneth Northermar piloting the head ship and we sticking dead on his tail. Suddenly our ship lurched.

Major Northermar's voice snapped into our radio: "Your wing's on fire." The rest happened quickly. Fire wrapped the wing—and the wing was full of gas—then the right motor conked out.

"We're gonna have to go," said Cook, wrestling with the controls. Through drawn lips he said, "I'll tell you when to tell 'em to go."

I ran back in the ship's belly and checked the chutes. The men were standing at the open door, ready.

Cook fought to get the ship over land before he let them go. He was trying to make an island off Prince of Wales.

"Now," he said. I gave them the high sign and we no longer had a crew. Cook and I scrambled out the top hatch and jumped together.

As my chute jerked open I saw my friend whiz down in front of me. I watched him until he disappeared behind a mountain. I don't know whether he was hit by the ship or not, or if he ever pulled his ripcord, but the chute didn't open. Later, I found that four crew members had met death on striking the icewater; that only the ship's engineer and I had survived.

That blue icewater was coming up fast, and the wind was taking me farther out from land. To land in the water was death. I dumped my chute hard on the land side and fell as far as I dared. Then I let the chute fill again, and hoped.

I hadn't hit in the water. My face was smashed and my back sprained. I was dangling by my chute from the top of two tall fir trees. Just dangling. It was a long way down. I knew if I kept swinging up there I'd freeze so I unbuckled my straps and let go.

Snow broke the fall and I bogged down waist deep in it. I knew I should do something but it hurt too much to move. I finally crawled under a tree and stayed there. Two hours must have passed before I got my bearings.

I knew I would freeze if I didn't get up and exercise, and keep exercising. There was a sheet of ice on my flight jacket. I groped for my emergency kit, then remembered my fingers had been too cold to get it off the chute in the tree.

The watch on my wrist said 12:20. It had stopped when I hit.

I struggled toward the beach.

Then I knew why I couldn't see. I was being blasted by a snow storm. I had to find shelter. My head was clearing.

I stumbled upon a dead tree which had fallen across a ravine, making a dry burrow. I crawled in and tried to build a fire.

Boy Scout tricks failed. The letters I took from my pocket for kindling wouldn't catch in the damp leaves. Desperately, I struck match after match.

When only one match was left, I pocketed it for possible future use and went on exercising, waiting.

I was on the beach. I didn't know how long I'd been there. It seemed ages. It must have been almost midnight when the storm abated. All I could think of was the pain in my back. But I kept moving around as much as I could. I had to. I don't know why, but I had one little tune in my mind and it stuck. I went on whistling it into the icy wind. "Ninety-Nine Miles from Home . . . Ninety-Nine Miles from Home."

I sat down to rest.

Terrified, I realized I had dozed off just for a moment. The "twack" of a drove of ducks hitting the water nearby had awakened me. I stood up, knowing I must not sit down again. I went on exercising.

I could hear a boat whistle. The thought that somewhere down the beach the boat might be looking for me gave me hope.

Suddenly the cutter came around the point, with lights on its decks and a big searchlight swinging in toward shore and combing the mountains behind me. I screamed at it until I no longer had a voice, but I could tell the boat was slipping past, leaving me.

Then I got the idea. As the boat turned to clear the point, I ripped down my outside clothing and snatched off my undershirt. I bent over that crumpled bit of cotton, my stiff fingers holding the last match. I struck it and the tiny flame flickered.

Then it caught the cotton and flared like a bonfire as I waved the shirt. You never saw a prettier blaze than that!

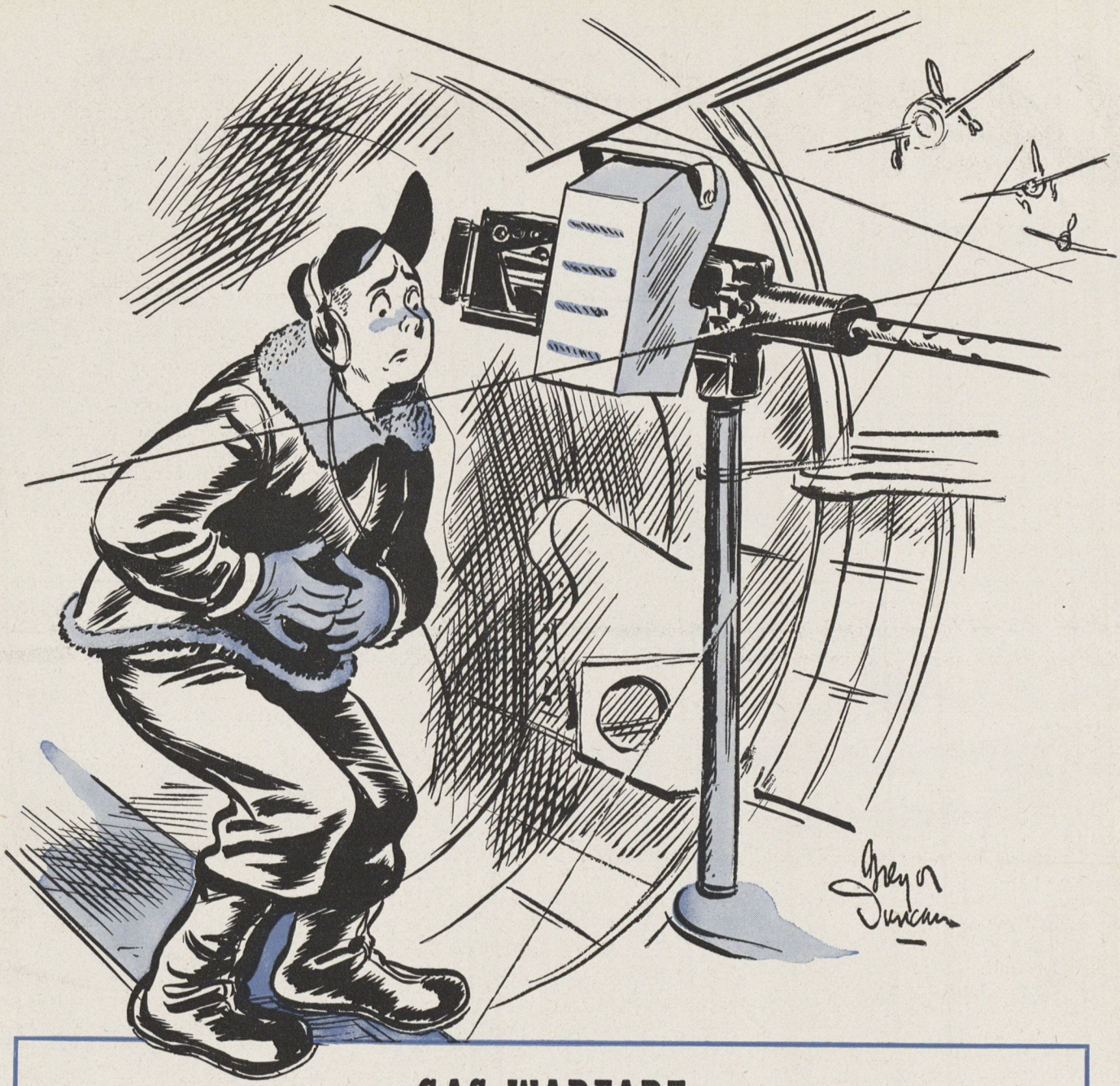
I was still waving when the searchlight turned slowly, deliberately, and pinned me in the middle of its shaft.

I sat down when the light hit me. All the strength went out of me and I flopped. I could hear the ship's dory being lowered from the cutter to come get me. I knew I was saved.

That was last February 8. For a long time after that, I thawed out in a string of general hospitals. When I got out, I went into a clothing store and bought some underwear.

I didn't just say: "Gimme four pairs of those things."

I said: "Gimme four pairs of UNDERWEAR . . . Cotton . . . Mississippi Cotton . . . the kind that'll burn." ☆



GAS WARFARE

Gas attacks aren't confined to land operations. For example, Olly, the waist gunner, is suffering from the high altitude variety—abdominal cramps—from something he et, no doubt. Must have been that strudel he had last night. Strudel doesn't like Olly.

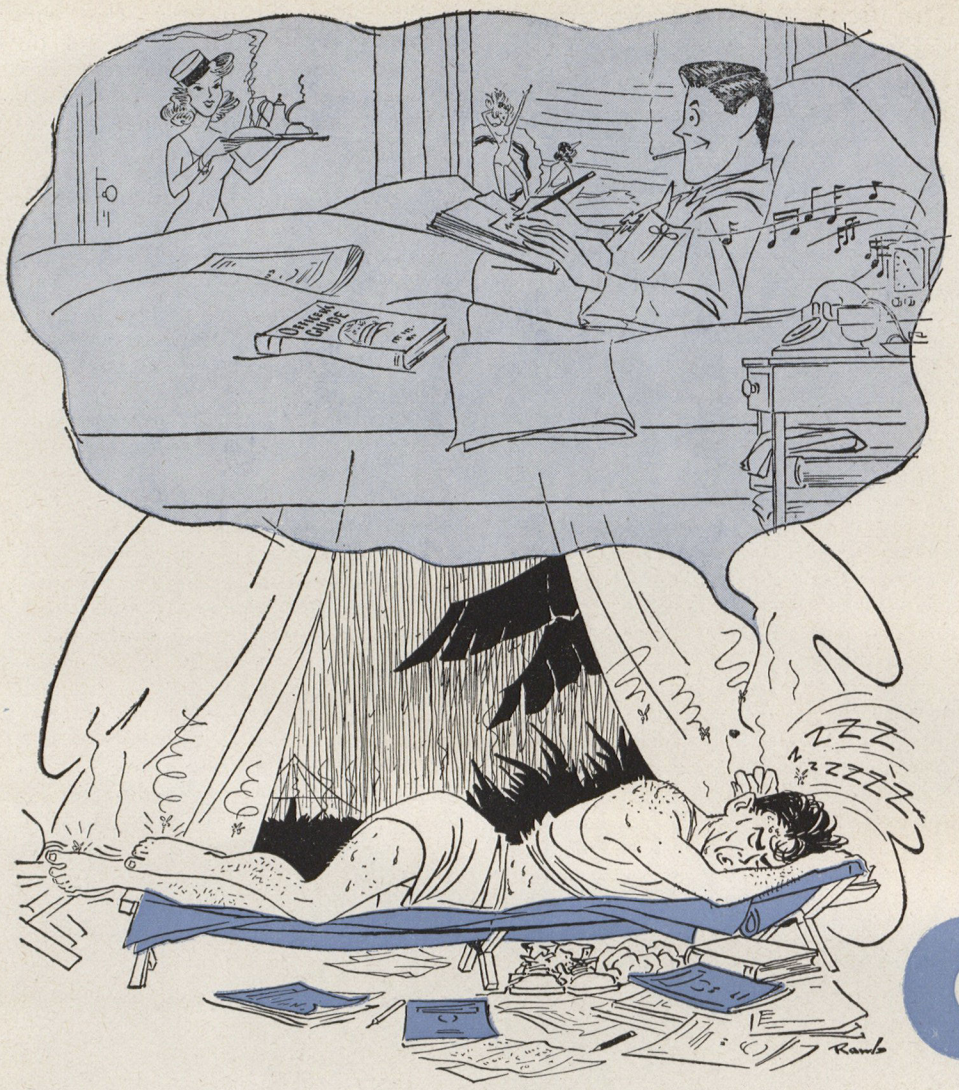
But if strudel disagrees with Olly at ground level, it's bound to make him about ten times more uncomfortable at 30,000 feet.

Gas expands at high altitudes, and gaseous distress is also severely increased by a rapid rate of ascent. Cramps are unpleasant and painful, but if your immediate concern is a Zero at eight o'clock, they can be dangerous.

The important thing is to avoid the most notorious of the gas-forming foods, such as dried beans, cooked cabbage, onions and the like. Remember the foods which cause you trouble and if possible eliminate them from your diet prior to a high altitude mission.

Olly's problem is strudel. Who knows? In your case it may be Egg Foo Yung. Make a note of it.

(Third of a series by the Flight Control Command.)



OCS—

THIS is not a rebuttal. It is a direct result of the article "Look Proud Mister—You're at OCS" which appeared in the May, 1943 issue of AIR FORCE, and it was further impelled by the months of living and working with graduates of the Miami Beach school. The unfamiliar, dark-sounding term "bracing," the stories of formal retreats, the hours of standing at rigid attention beneath the Florida sun, the precise agony of preparing a hotel room for an all-comprehensive inspection, were so in variance with the routine of our OCS in Australia that this article was as natural as a newly dug slit trench after a surprise raid.

The original article, written by a graduate of the Miami Beach School, wandered into our palm-roofed native hut in New Guinea one day in July. It was raining again, meaning that the ceiling was down to the grass of the revetment area, the long dirt strip was heavy with mud, and the metal fighter strip was deceptively smooth with a thin layer of earth and water. Weather ships were flashing back reports that it was going to be that kind of day—a day for work in the shops, for a detailed study of news reports, for a hand in the floating poker game that was certain to crop up again in the late afternoon or early evening.

That article in the May AIR FORCE held a definite interest for a member of the first class of the Officer Candidate School in Australia. The contrasts invited comparison. Magazines describing the Miami Beach school had always been in demand among the candidates from Down Under, because all of us had been fascinated by the hotels, the traditions and the bracing, the countless platoons drawn up for formation, and the nearness of Miami itself to air-conditioned clubs and sweeping beaches.

Miami vs. Camp X. A brilliant resort against a new camp in a forest near an Australian city. Luxury hotels and real mattresses against small huts and mattress-bare canvas cots. Thirty-six platoons at Miami, graduating before a grandstand of wives and relatives and friends, against one bob-tailed platoon marching across a dusty road to a hasty graduation before an audience of twenty civilians, the faculty and a few men of the camp who were free of duty that morning.

Illustrated by James T. Rawls

The first graduating class of our OCS held a few hundred men, representing all arms of the service of the Army and Air Corps in Australia and New Guinea. They had come from Port Moresby, Darwin, Sydney, Brisbane, Buna and all the remote fields and outposts of the Allied forces. They had come by air across the Coral Sea and by various types of ships down the coast, by truck over the highways of Australia and by the rattling trains that cut over and through the miles of mountainous coast. Singly, by threes and fours, wearing freshly-creased khakis and worn coveralls, they had straggled in until it was past the deadline. The school, scheduled to open on January 1, held its orientation day on the third, and the late arrivals had been given the privilege of attending extra classes to bring their work up-to-date.

Spit and polish at Miami, in the tradition of the line outfits, came in the form of forced compromise at Camp X, although the lack of laundry service was modified by the old army tradition of GI soap, brush and muscle. The fifty-pound limit on airborne baggage weakened the orthodox stand, for it limited the number of uniforms (if the man possessed a number of uniforms) against the articles the man did not care to risk to slower transportation. There was, of course, no compromise with neatness, promptness and obedience of the rules set forth in the blue booklet of regulations. The rules were there in black and white, open showers were available as a laundry, and boot polish was one of the few items on sale at the understocked PX. It was not all knife-edge trousers and crisply done shirts, but the morning formations were spruce and alert in the cool hour after dawn.

Men in the Air Corps platoon added up to interesting contrasts. There was one out of the Philippines, evacuated first to Java for duty in the rear gunner's cockpit of a dive bomber. Two others had been in the Java show before going to Australia. A bombardier out of a medium bomb outfit was there for the first formation. He had flown from Hawaii and had been in tightly calculated raids over Lae and Salamaua before their names were even faintly familiar to the people at home. Another, educated in a famous old New England prep school and in France and at Oxford, had come the long way from first experience in the Volunteer Ambulance Corps of Finland through a long siege in New Guinea to reach the new school. In the rear rank a long,

Australia

The first AAF officer candidates in the school Down Under led a double life with the Infantry, Engineers and Field Artillery.

By Lieut. W. F. HOUHA

COMMUNICATIONS OFFICER WITH AN ATTACK GROUP IN THE SOUTH PACIFIC

lanky, sardonic technical sergeant—without stripes—stood like a dark guidon. He had been with the British for eight months in 1941 on an educational mission with P-40s, in Egypt, Syria, Iraq, China, aboard the Clipper in the Philippines and Hawaii thirty days before war came. Beside him were two engineers, line chiefs out of fighter squadrons at Darwin, remembering their nine months in that far outpost of dust and heat and raids. There was a radio man in the formation, wearing old khakis not improved by hours of sitting on the floor of a stripped down transport as it bucked its way through storms over the Coral Sea. He had been at Milne Bay for four months and he was deeply impressed by the brown dust of Camp X. There hadn't been any dust at that humid, rain-soaked tip of New Guinea.

The platoon held sergeant-majors, first sergeants, engineers, bombardiers, armorers, radio men—one with 3,000 hours in the big ships—personnel men out of the big headquarters, supply sergeants. And even a basic, whose total freedom from technical training and an even cleaner record in the Panama infantry had caused sorrow to the statistical officers of the Air Corps when they first tried to place the square peg in the round hole. The men came out of service groups, fighter squadrons, medium and heavy bombardment outfits, from isolated units operating independently in a vacuum and from units under the critical eye of the commander in chief. They covered the Air Corps like Joseph's cloak.

WE formed in the rain, that first morning, marched across the road onto the parade ground and sat down on persistently wet grass to listen to the orientation speeches by the colonels, majors and captains—the officers who had been assigned the duty of training us to become officers. The Air Corps platoon felt out of place in that company with no familiar, reassuring silver wings in sight. The crossed rifles of the Infantry, the cannon of the Artillery, the colorful flags of the Signal Corps and the Ordnance bomb—but no wings. The colonel made a careful effort to welcome the section, but when all eyes turned to appraise critically, the eight ball lifted its shadow.

The brief introductions told us that it was to be a twelve-week course, divided equally between basic and specialized training. It was expected that all men would conform without difficulty to the rigorous routine since the average length of service indicated that experience had fitted them for the correct drill, courtesy and discipline demanded by the school. The faculty was to proceed on the premise that the candidates were soldiers, qualified not only by past training but by actual service in the fields of maneuvers and combat. The fact that a good percentage had returned from forward areas was to permit no relaxing influence on the discipline of the school.

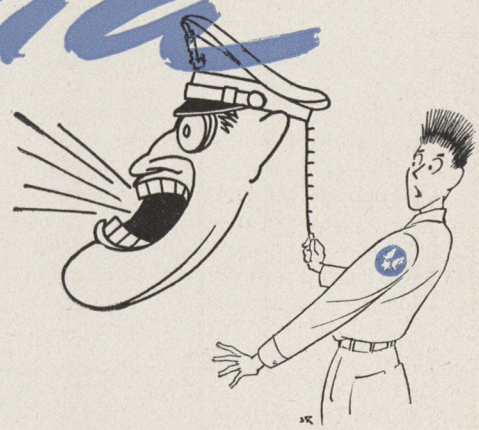
Brief, clear—leaving no room for misinterpretation.

The six weeks of basic began with thirty long minutes of physical drill. The entire student body worked out before an uncompromising instructor who machine-gunned the drill with speed and precision and, we thought, an unwarranted premeditation. It hurt, because New Guinea and the Northern Territory, with months of field rations, dawn pre-flights and night stand-byes, had not been conducive to top physical condition. The familiar black-out effect of the tropics threatened to end that half hour prematurely for a few, but they steadied against the giddiness and held on. They had come too far to permit losing out in the beginning.

Rifle drill, military courtesy and discipline, military law, map reading and aerial photography, mess management, chemical warfare, company administration, symbols. Disciplinary drill on the narrow company road. The high-pitched pleading of the second lieutenant of Infantry, out of Panama, assigned as our platoon commander, to remember that we were not in the Air Corps for those six weeks, but in the Infantry. To remember the look of deep agony on his face when one of us would call the "squadron" to attention, instead of the "squad," is sheer pleasure, now that it's all over.

We had a split life down there. We lived and drilled with the Infantry and the Engineers, and attended class with the Field Artillery. It meant that the major of Artillery would make reference to batteries and battalions, and the Air Corps candidates would commit the unforgivable by translating the terms into their equivalents of flights and squadrons. On those five-mile hikes through the marshes and over the sudden hills of the surrounding forest, carrying a map board, coordinate square and ruler, the long-legged major walked the class into the ground. "I want the grid coordinates of this culvert, gentlemen," he would say striding along while your half-empty canteen nudged the hip suggestively, with two hours of the Australian tropical summer heat ahead.

There was Judo and bayonet drill, brawling in the dust of the barrack area, learning the fine art of killing with civilized efficiency and extreme dispatch. Night problems in scouting and patrolling were interspersed with those sessions on a hillside at midnight. With an immense open plain as the stage, we listened to the invisible instructor lecture on time-distance, on the correct method of cutting through wire emplacements. We listened for the sound of muffled cutting tools, for the sound of a rifle bolt as it was drawn quietly and for the instructor who would ask: "A thousand yards? Five hundred? How many men are coming through the wire?" We watched, grimly fascinated, as a guard walked post and a silent figure, visible for a brief instant in the shadowy beam of a flashlight, stepped high and softly in the tall grass to go into precise motion, hitting hard and whipping a length of slender cord around the guard's neck and ankles.



We advanced through the woods of Hill 200, against the waiting snipers, invisible against the foliage in their perfectly blended jungle suits, and felt the familiar quickening of the heart again, as if the off-beat of the enemy bombers, or the sudden, shattering sound of strafing planes was near. We went for cover

when the engineers blasted a deep set charge to send rocks and splinters in a cascading shower over a hundred yard area. They gave us shovels and picks, and taught us the exact art of digging a dive trench. To most of us, that was really gilding the lily. If there was a job to be done, they saw to it that it was our job.

It wasn't easy, not even for the Infantry veterans of the Buna campaign. But no alibis were accepted and none were given. The man called out of ranks to handle his squad or platoon was expected to whip out commands with clear authority and decision. If he was given the order to instruct for ten minutes on an intricate phase of the Manual of Arms, a ranking officer was there, studying his voice, manner and confidence. The man who faced his squad into the sun during a brief lecture, the man who showed indecision in a crowded drill area—these were the men marked down for a later meeting with the Board. We did have the Board, as part of our tradition.

THE school made its mark. The instructors drilled unceasingly upon the need to conquer the assigned subjects, not only to earn the coveted commission but to gain the confidence so necessary to instruct the men an officer had to command. It was the Infantry speaking, but to all of us it was the Old Army. The Old Army that has always been a gigantic school, steadily pushing a difficult curriculum against a vital need. The instructors made us alive to the fact that as officers we had to know men and had to be capable of accepting responsibility with assurance and accuracy of judgment. It was a big order. It all could have been defined with one word: Responsibility.

It wasn't all work, of course. The faculty recognized the need for a break in the routine and permitted freedom from 1700 hours Saturday to 1900 hours Sunday. This ruling was subject, through an unusual provision in the school regulations, to rescinding at the discretion of the CO. Our first three Sundays were spent pacifying the Old Man's wish that a road be built through the area—with a bridge where it was needed—and that an obstacle course be engineered in a remote section of the camp to further plague the candidates. After those jobs were completed, the Sundays were free. Unless a man was fortunate enough to pull a Saturday night guard.

A free half day was granted on alternate weeks to allow the men to go into town for necessary purchases. The half day permitted candidates to make the fifteen-mile, transportationless (unless one considered the shyly hesitant 1:38 train) journey to town in time to hurtle into a pub minutes before the last ounce of beer drained out of the kegs, to get a meal in a crowded restaurant, to make reservations for the Saturday night cinema, and to shop without hope in the stores that had so little to offer after three years of war. The streets of the big town were filled with service men and service women. Sailors. Air Corps men on leave from the North. Australian WAAFS. Diggers with triangular patches on their hats of the famous upturned brims, showing that they were veterans of the returned A.I.F. from Tobruk and the Middle East. Sailors from a Free French destroyer, very Gallic in immaculate white shorts and shirts, gesticulating sharply as they paraded through the crowds. The stolid jungle green uniforms of the Dutch, so amazingly heavy for the tropical sun. MPs and the Navy's Shore Patrol, walking easily, swinging short clubs and tolerantly ordering celebrants to button up that shirt, to fix that tie.

The blue OCS badge brought on questioning, for it had not been there before. What did it mean? What outfit was you guys with? When did you get over from the States? We offered the modestly satisfying reply to all street and pub questioners that we were members of the newly formed Overseas Cargo Service, that we had just arrived from the States, and that we were returning Tuesday weather permitting.

The first six weeks went swiftly after the first week, with its initial shock of drill, discipline and endless lectures, had finally come to an end. The tempo of the drill increased. The morning physicals began to take on a snap and precision that brought a grudging gleam of approval to the critical eyes of the line officers who invariably happened to be standing by as the Air Corps went through the morning drill. The weary afternoons of rifle dry runs, of lying in the dust with the sun beating heavily down and an instructor walking behind the line, prodding: "Get those heels down, bring that elbow under, get that strap clear up to the armpit and your thumb across the stock," finally led to a full day on the range and the good feel of the jar of the rifle flowing through the arm. There are not many satisfactions as great as watching the marker come up to cover the black circle.

We had no ceremony, of course, when the second half of the course began for there was no senior class. We were given one farewell speech, when the colonel of Field Artillery put away the last field manual, leaned on the tiny rostrum and said: "We of the Field Artillery have enjoyed having the Air Corps with us for these past six weeks. You have been good students and soldiers. If you ever want to transfer to a real outfit, the Field Artillery will be very glad to have you."

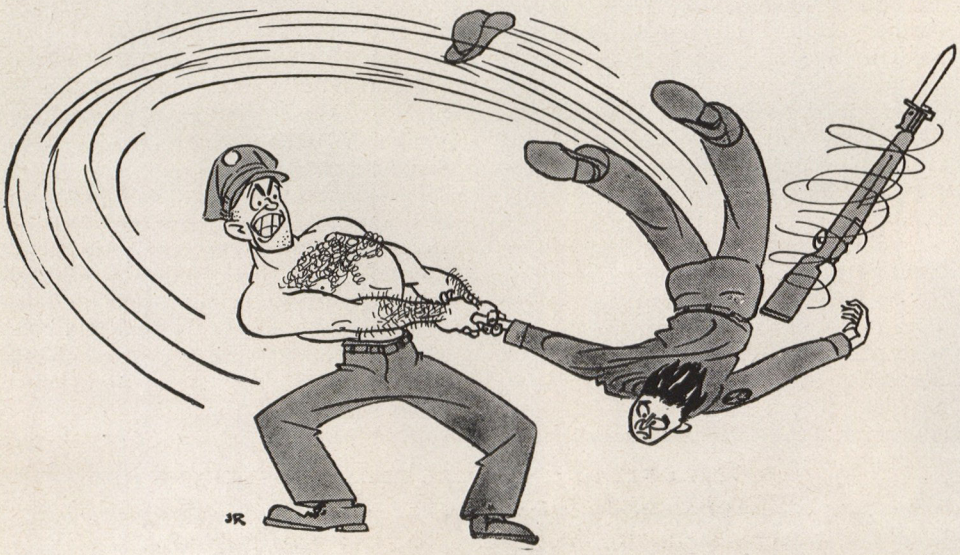
It was, we wished to believe, a compliment. It did mean that we had been accepted.

The Infantry went into the field with its machine guns, howitzers, rifles and packs. The Engineers reached for their instruments and manuals, and anticipated without anticipation the building of roads, emplacements, the hurdling of the wide, nearby river by pontoon bridge. The Air Corps went into Administration.

A Miami graduate would be familiar with the routine. There were only a few cardinal differences. The majority of the instructors were staff officers from Air Force headquarters, each dealing with his specialty. They talked directly from experience, without textbooks, and were often backed to the wall by the practical questions of students who had been waiting for months to ask about supply, delays, equipment and a hundred other matters that had boiled over during the months overseas.

They gave us brief lectures on engineering, the theory of flight, instruments, weather, communications—on all technical subjects—to acquaint us, they explained thoughtfully, eyeing the average service of 31 months, with the terminology of the Air Corps.

A navigator (Continued on Page 53)



LIFE RAFT EXPERIMENT

The following article is based on the combined observations and conclusions of three officers who played important roles in a life raft experiment conducted on the Gulf of Mexico several weeks ago. They are Maj. George W. Holt, director of air medicine at the AAF School of Applied Tactics; Maj. M. W. Boynton, surgeon of the Flight Control Command, and Capt. George H. Waltz, chief of the air-sea rescue section of the FCC.—THE EDITOR

A FEW weeks ago, two rubber life rafts could be seen drifting in the Gulf of Mexico twenty miles off a Florida base. To all appearances, they held the survivors of a crash landing at sea. Actually, the occupants were officers and enlisted men who had volunteered to test the rafts and the equipment and rations furnished for emergencies on our bombardment aircraft.

The experiment, which lasted six days and six nights, was under joint supervision of the Flight Control Command and the medical branch of the AAF School of Applied Tactics. It was made to determine the following:

1. The desirability of drinking lots of water prior to long over-water flights.
2. The advantages or disadvantages of keeping the clothing saturated with sea water in an attempt to prevent perspiration and thereby conserve body fluids.
3. The relationship of such factors as exercise and solar exposure to the rate of dehydration.
4. The advisability of drinking large amounts of water when it becomes available after prolonged dehydration, as compared with drinking small amounts at frequent intervals and hoarding the remainder.
5. The effectiveness of various sunburn lotions and creams.
6. The desirability of including certain items of diet now provided as emergency rations.
7. The practicability of all equipment in life raft kits.

The test also was intended to provide a source of information, based on controlled practical experience, for teaching purposes.

At 1630 on a Sunday nine officers and enlisted men, wearing summer flying suits, fatigue hats, socks and shoes, went overboard from the Army Crash Boat P-269 into the two life rafts. For the next 135 hours, or until approximately 0600 the following Saturday, all but one of these men remained constantly on the rafts, except for short periods on board the attending crash boat where daily medical studies were made. Thus, most of each day and all of each night were spent on the rafts, affording a good opportunity to study both the equipment and the physical and mental reactions of the men aboard the rafts.

During the first night, five men occupied the A-3 (1,000-pound capacity) raft and four men the E-2 (2,500-pound capacity) raft. Throughout the night a severe rain and wind storm kept the rafts and their crews constantly alert and continually drenched with sea water. Sleep was impossible. After the first few hours

Some conclusions reached after eight officers and men spent six days and nights on the Gulf testing raft equipment.

of wind, rain and heavy seas, one of the four men on the E-2 raft became so violently seasick that he had to be taken off the raft and subsequently moved to a hospital on shore where he remained for 36 hours. This man lost eight and a half pounds during the night and went into shock so severe that neither his pulse nor his blood pressure were obtainable at times. He also became disoriented and confused. From his experience it became quite evident that seasickness can become severe enough to a man adrift on a life raft to result in death.

THE next morning, inspection of the kits fastened to the floors of the life rafts showed that because of the lack of watertight closures on the kit containers almost half of the equipment was ruined and had to be discarded. Signal flares were soggy and unusable, the first-aid kit was completely soaked in sea water, the Very pistol was badly rusted as was a .45-caliber automatic pistol placed in the A-3 raft kit for safekeeping, and the rubber patching kit was so badly water-soaked that it could not have been used to repair even a small puncture or rip in the raft. MORAL: Inspect the life-raft kit in your airplane and place flares, first-aid kit and any other pieces you feel may be ruined by salt water, in waterproof bags. If you can get them, waterproof icebox bags are satisfactory. Grease your knife, Very pistol and automatic before every long overwater flight.

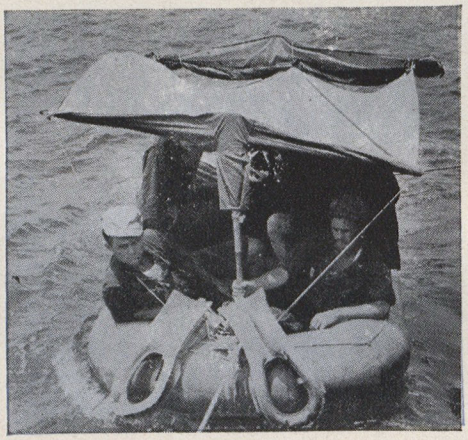
Because of the extreme crowding on the A-3 raft, two of the five men moved to the larger raft the following morning, and for the rest of the test three men occupied the A-3 and five men the E-2.

To make the test as complete as possible, various duties were assigned each man. Throughout the following day, the men on the smaller raft attempted to protect themselves from the sun by stretching a tarpaulin over the raft, while the men on the E-2 raft had no such protection. The men on the larger raft felt the effects of dehydration considerably more than the men on the A-3 raft. MORAL: Use your oars, sail and/or tarpaulin, yellow side up, to rig a canopy over your raft. Besides protecting you, it will make your raft easier to see.

During the first 24 hours, none of the men had either food or water. After that, seven of the eight men were given a reduced ration of one standard K ration box and 330 cc (approximately two-thirds of a pint) of water a day, while the eighth man continued to do without food or water for four days and four nights. A 38-year-old medical officer, he experienced no great hunger or thirst after the initial period of accommodation to conditions, indicating that with proper self-imposed discipline even a considerably longer period of fasting is possible for anyone in good physical condition. As a matter of fact, this officer, without food and water, felt thirst far less than the average of the other men who had their daily ration of food. MORAL: When you have no water, don't eat dehydrated or dried heavy foods.

Before going on the raft, this officer had fortified himself by drinking large quantities of fluids—the total equal to more than three times his usual daily consumption. To this and to the fact that, although an inveterate smoker, he stopped smoking when he got aboard the raft, he attributed his lack of any great feeling of thirst for the 96-hour period. MORALS: Drink all the liquids you can comfortably hold before and during all long overwater flights. Don't smoke if you have no water.

On the third day, two of the men were so completely dehydrated that an additional water ration became necessary. The men were weak and mentally confused. Each was given two quarts of water,



Taking part in the experiment.

which he drank within an hour. Contrary to general belief, they experienced no feeling of nausea but quite the reverse—a feeling of renewed strength and a brighter mental attitude. A careful medical check of these men during the next 36 hours showed that they retained most of the water taken. MORAL: If you collect rain water, immediately drink as much of it as you can comfortably hold. Your body can store water and it makes a far better container than a bailing bucket or a tin can. Store the rest, preferably in the regulation water cans which you have already emptied. Some of the water taken in large quantities when you are dehydrated is lost through perspiration or excessive urination. However, a quart of water in your body is worth several quarts stored where they may be lost if the raft tips over or spoiled by sea spray.

For the duration of the test, one man kept his clothes continually wet with sea water and at the same time kept himself out of the sun as much as possible. Without any greater feeling of thirst than the rest of the men, he was able to exist with considerably less than the regular daily ration of water. MORAL: In shark-free waters and warm climates during sun up hours dunk yourself, clothes and all, periodically. Lower yourself over the side slowly to keep your face and mouth out of the sea water. Don't exert yourself by swimming, just hang onto the hand line. If one's general condition precludes dunking, the clothes may be splashed with sea water.

During the third and fourth days, two men with little previous fishing experience were detailed to test the life-raft fishing kit. They were handed the kit and given no further instructions. Selecting the largest hooks and lines, they fished for several hours. Result: No fish. It was then suggested that they try the smaller hooks and pork-rind bait provided in the kit. Within twenty minutes a small fish was hauled aboard. It was cut up for bait and used on the larger hooks. Within an hour, two ten- or twelve-pound fish had been caught. MORAL: Don't go after the big fish first. Catch small ones with your small hooks baited with pork-rind and cut up the small fry for baiting the larger hooks. Don't try to hook excessively large fish, for they will only break your line and run off with your hooks and bait.

MEDICAL tests made before, during and after the experiment showed total weight losses ranging from one to ten pounds with the average loss somewhat over a pound a day for each volunteer during the six-day period. The thinnest men at the start lost the most at the end, the fattest the least.

Except for a general weariness and mental fatigue, there were few changes physically in the men. A comparison of the results of the physical examinations for flying (W.D. A.G.O. Form No. 64) given before the start of the test and those given at the conclusion showed only minor variations.

The circulatory systems as measured by electrocardiogram, pulse, blood pressure and Schneider index showed no evidence of deterioration. The eyesight of all volunteers remained normal in spite of the daily exposure to wind and sun.

The greatest single factor contributing to the general weakness which first evidenced itself on the second day was the inability to get comfortable enough in the rafts for restful sleep. The best position was found to be crosswise with the men alternating feet first and head first, but even in that position it was difficult to sleep for more than a half to three-quarters of an hour at a time.

Out of the test also came a number of suggestions for additions and changes in the life-raft rations and medical kit and life-raft equipment kit. These recommendations are being passed on to the proper agencies for consideration. ☆

AAF TRAINING COMMAND

Our training operations following consolidation of the Flying Training and Technical Training Commands.

IT is difficult to comprehend the time, effort and money necessary to train the ground and air crewmen for just one American bomber.

But we do know that for one bomber the training assignment is immense. The pilot gets a $25,000 course in which he learns to guide his four-engine Fortress or Liberator, and to fly on three motors and on two through night and storm. The navigator is an expert at tracing reliable paths through strange skies. Weeks of mind and body-wracking study give the bombardier a right to boast, "I can put 'em in a pickle barrel." Gunners fire thousands of rounds of skeet, .22 cartridges, 12-gauge shotgun shells, .50- and .30-caliber bullets before they are judged ready to put the sting in our bombers.

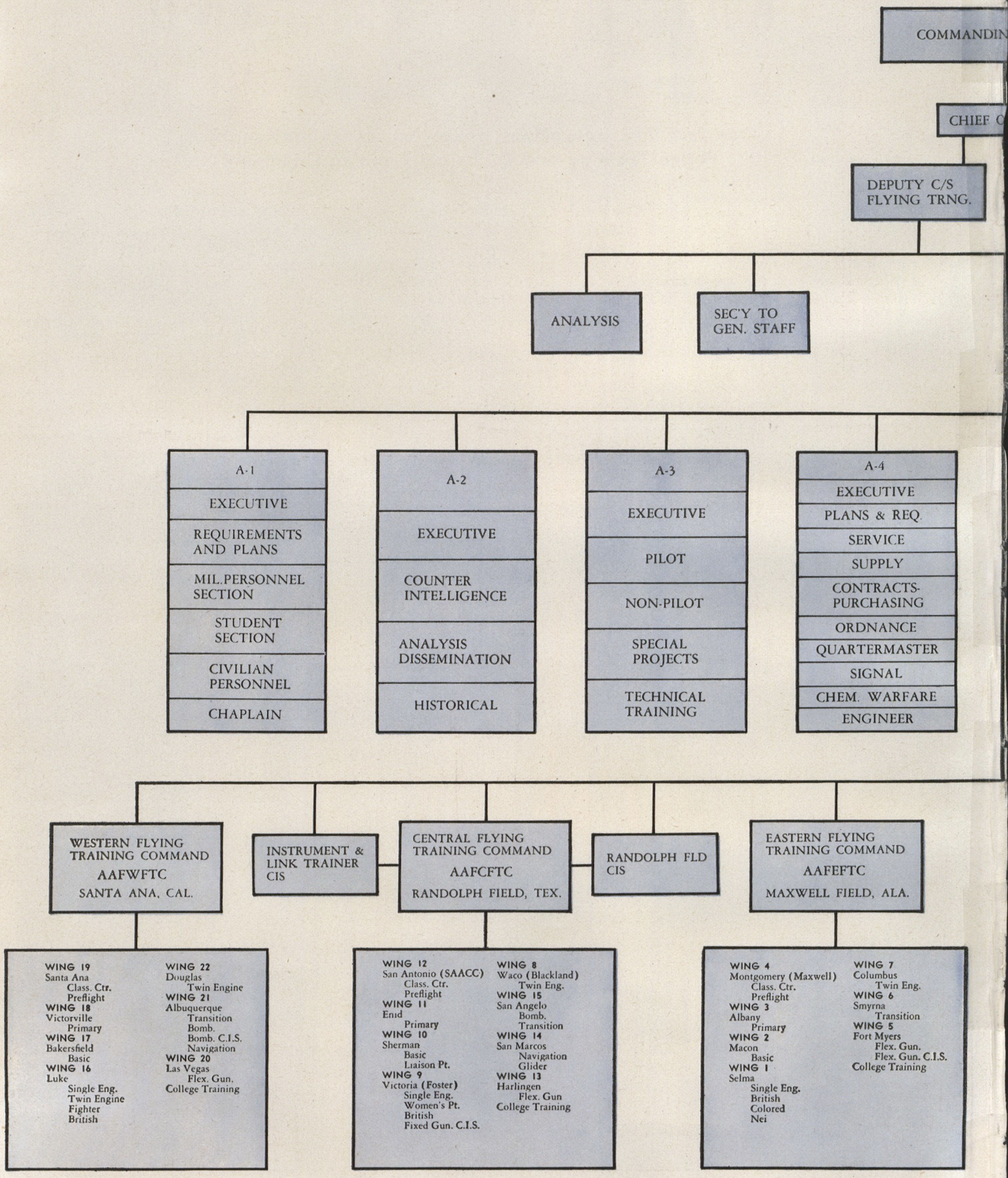
The mechanics first become intimate with propellers, instruments, engines, hydraulics, electrical and fuel systems, and the other working parts of aircraft before they are ready as maintenance specialists. There has to be a system to teach the armorer about electricity, how to assemble machine guns blindfolded, how to load ammunition and bombs and adjust power turrets. The radio man learns to send and receive, repair, maintain and install aircraft radio, and to master operational and airdrome tower procedure.

There are the parachute riggers, weather forecasters and observers, and many more.

Multiply the problems involved in manning that one plane by the total of all the bombers, fighters, trainers, gliders and miscellaneous types *(Continued on Page 30)*

General Yount (seated) and the commanding generals of the flying and technical training commands (left to right), Generals Hanley, Fickel, Brant, Curry, Cousins and Martin.

ORGANIZATION ARMY AIR F
(COMBINING AAF



ORCES TRAINING COMMAND

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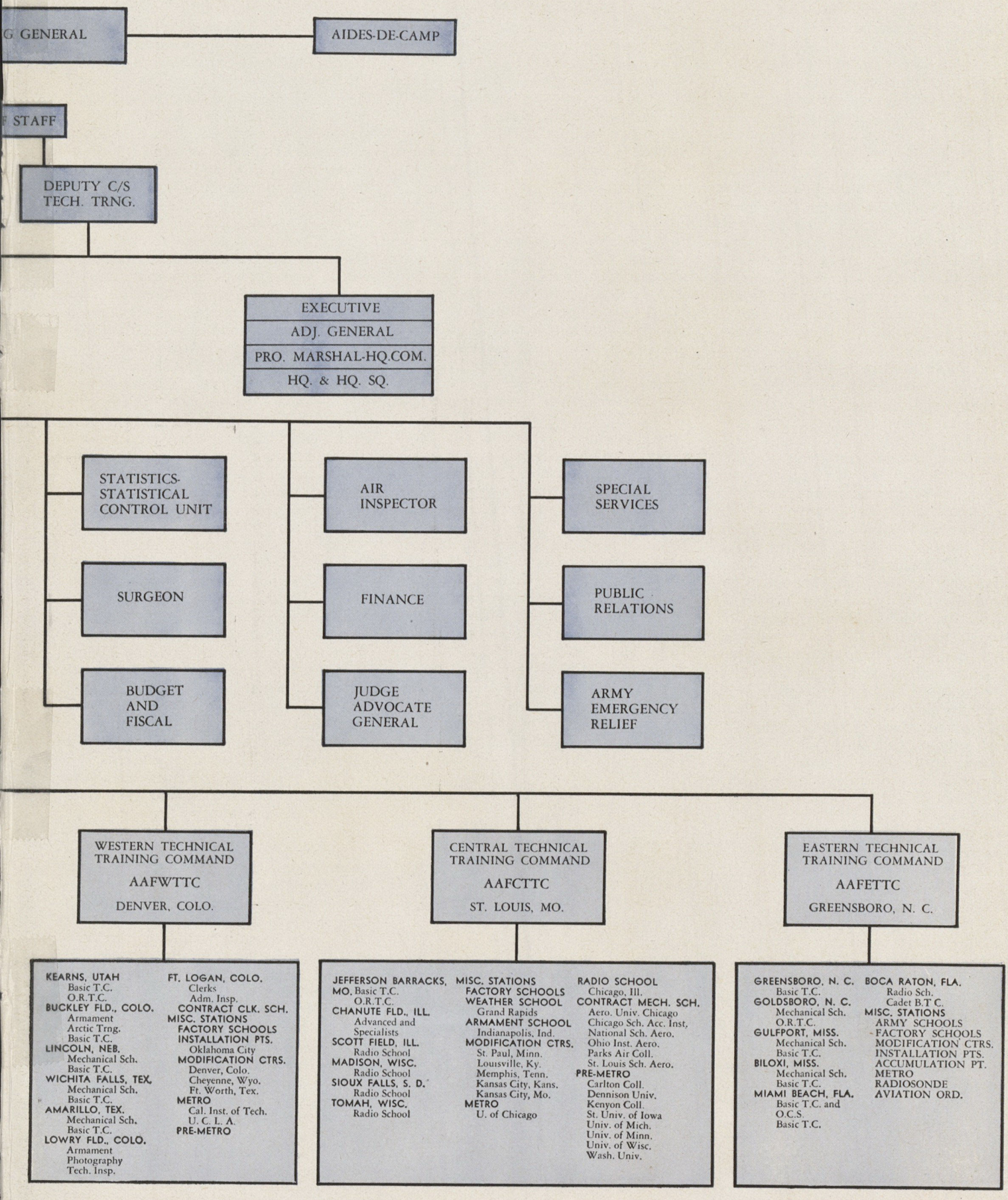


of aircraft that constitute the greatest air arm in history, and you may get an idea of the responsibilities which rest upon the Army Air Forces' newest agency—the Training Command.

The AAF Training Command is new, but the two parts of which it is composed already were well-known and respected, each in its own right, for the importance of their individual operations.

The Flying Training Command had accomplished the task of supplying the personnel for an air force sufficiently powerful to turn back an enemy that had a big edge in the beginning. Its alumni are the pilots, bombardiers, gunners and navigators who have written their names in destroyed Axis planes and properties in Europe, the Aleutians, North Africa and New Guinea.

The Technical Training Command made possible the attainment of the ultimate goal of the flying training organization. For, without TTC's mechanics, technicians and other ground-experts, there would have been no planes to fly, no guns to shoot, no bombs to drop.

Flying and technical training always have been blood-brothers. There were common problems which often brought officials of the two programs together. And, of course, there were countless common interests and, most important of all, the mutual desire for victory.

It was but a natural blending when, on July 7, 1943, the War Department announced that the Flying Training Command and the Technical Training Command would be consolidated to form the Army Air Forces Training Command. Maj. Gen. Barton K. Yount, who had been chief of the flying training program, was named commanding general of the new twofold Command.

Integration and streamlining of the air and ground training mission of the AAF was accomplished to achieve an even greater coordination in effort. The reorganization calls for maximum efficiency in operation, with a minimum of staff personnel and disruption of current activity.

In addition to Brig. Gen. Walter F. Kraus, presently appointed chief of staff, General Yount's headquarters in Fort Worth, Texas, now includes Brig. Gen. William W. Welsh as deputy chief of staff for flying training, and Col. John P. McConnell as deputy chief of staff for technical training.

The consolidated Command represents the largest such unit within the Army with headquarters outside Washington.

The new Command is nationwide in scope. It has been divided geographically into western, central and eastern areas, within which flying and technical training functions will be closely coordinated.

Flying Training Centers, (West Coast, Gulf Coast and Southeast) which existed under the old Flying Training Command, have been redesignated respectively as

AAF TRAINING COMMAND

(Continued from Page 27)

the Western Flying Training Command, Central Flying Training Command and Eastern Flying Training Command. Headquarters remain the same, with Maj. Gen. Ralph Cousins commanding the WFTC at Santa Ana, Calif.; Maj. Gen. Gerald C. Brant, the CFTC at Randolph Field, Texas, and Maj. Gen. Thomas J. Hanley, the EFTC at Maxwell Field, Ala.

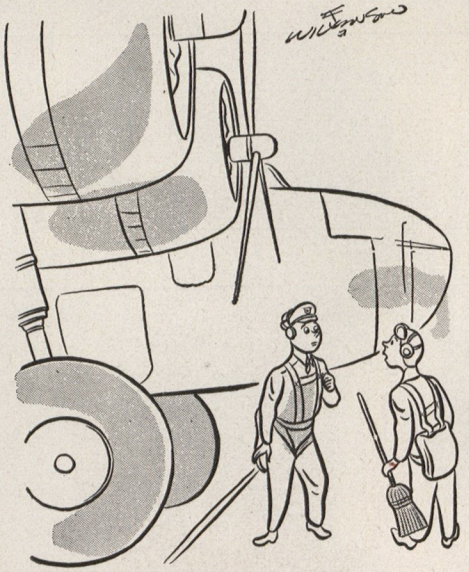
Flying Training Wings, each commanded by a general officer, will continue to operate within each of the three Flying Training Commands. Established on a purely functional basis, training wings will serve to coordinate training activities at the various specialized schools in accordance with directives from higher headquarters. In the WFTC, two wing headquarters are located at Santa Ana, Calif. Others are at Bakersfield, Calif., Luke Field, Ariz., Douglas, Ariz., Albuquerque, N. Mex., and Las Vegas, Nev.

Wing headquarters in the CFTC are at Enid, Okla., and at San Antonio, Sherman, Victoria, Waco, San Angelo, San Marcos and Harlingen, all in Texas.

EFTC wings are located at Montgomery, Ala., Valdosta, Ga., Macon, Ga., Selma, Ala., Columbus, Miss., Smyrna, Tenn., and Fort Myers, Fla.

The five former technical training districts have been consolidated into three Technical Training Commands. The reorganization provides for the inactivation of the old Technical Training Command headquarters at Knollwood Field, N. C., and of the Third and Fifth Technical Training Districts, with headquarters at Tulsa, Okla., and Miami, Fla. Facilities at Tulsa and at Miami were reassigned to the three new Technical Training Commands, effective August 31, 1943.

Commanding the new Western Technical Training Command, with headquarters at Denver, Colo., is Maj. Gen. John F. Curry; Central Technical Training Command, St. Louis, Mo., Maj. Gen. Frederick L. Martin, and Eastern Technical Training Command, Greensboro, N. C., Maj. Gen. J. E. Fickel.



"Didn't you say we are going to sweep the channel?" —FRITZ WILKINSON

Individually, the Flying Training Command and the Technical Training Command were conducting coast-to-coast activities which staggered the imagination. The over-all program, vested today with the job of producing the complete manpower needed to win an air war, is almost beyond comprehension. The duties of the new Training Command constitute a serious challenge, and one which must and will be met successfully.

From the Atlantic to the Pacific, from the Gulf of Mexico to the Canadian border, there are college training programs in progress for future aviation cadets; pre-flight and classification schools; elementary, basic and twin-engine and single-engine advanced schools for pilots; two- and four-engine pilot transition schools; bombardier, navigation and gunnery schools; Central Instructor Schools for "teachers" of flying, bombardiering and gunnery; liaison pilot schools and others for West Point cadets, women ferry pilots, glider pilots and foreign nationals.

The Training Command, on the technical side, will conduct the AAF Intelligence School at Harrisburg, Pa.; Administrative Inspectors' School at Fort Logan, Colo.; Photographic Officer Pilot School at Lowry Field, Colo.; Administrative Officer Candidates School at Miami Beach, Fla. and the Statistical Officers' School at Cambridge, Mass. In addition, there are scores of schools for airplane mechanics, aircraft machinists, sheetmetal workers and welders, armorers, parachute riggers, radiomen, glider mechanics, aerial photographers, weather observers, weather forecasters, teletype maintenance men, and for aviation cadets who will be trained for the duties and responsibilities of technical officers.

Two paralleling organizations have been dove-tailed naturally into one smooth production line. Bringing them under the jurisdiction and direction of the same authority will coordinate training with requirements, changes with developments and manpower with machines.

Key personnel of the TTC are moving into enlarged office space in the former FTC headquarters building in Fort Worth, a city chosen because of its central locality and ready accessibility to every flying training field in the nation by military or commercial aircraft.

The Training Command's prescribed task is to see that the two endeavors of flying and technical training are performed as one in the most efficient manner possible. Officials in Fort Worth, officers and men at the many stations, and cadets and students in every corner of the United States intend that this task shall be accomplished. ☆

THE NEW MUSTANG P-51

The P-51 is the AAF's only "war baby" now in combat.

With no family tree of design precedent, the P-51 was conceived seven months after the Nazis invaded Poland, carried from the idea stage to a warplane when the Germans were marching through Western Europe and taken on its maiden combat flight after the fall of France. The British called it the Mustang, "tough, maneuverable, no vices."

Today, American and British fighter pilots are receiving a new P-51, a high-altitude version of the Mustang, powered with the Packard-built Rolls-Royce Merlin engine. In this version, critical altitude and horsepower of the plane have been increased greatly by the Merlin engine with its two-stage supercharger. Wing design changes have raised the fuel capacity, giving it greater range than any other single-engine fighter.

Test pilots are enthusiastic in their praise of the new P-51 models. They like its speed, high-altitude performance and ease of handling. A combat veteran, after testing the ship, likened the controls and handling instruction to those of the AT-6 and said he felt as if he had "just attended old home week and met an old friend."

Rapid response to the controls and ease of handling are also characteristic of the early P-51, but modified control surfaces make them even more pronounced in the later version. Other factors which contribute to these features and add to the pilot's convenience are automatic oil and prestone shutters, automatic supercharger control, simplified gas system and a device which automatically locks the tail wheel in fore and aft position whenever the elevator control stick is in a position aft of neutral.

Years of testing, research and experimentation usually precede the production of a combat plane. The P-40 was developed from the P-36, the P-47 was an improvement of the P-43, and the P-38, an original design, was conceived long before the war and was on the production line before December 7, 1941. Not so with the P-51. It was dreamed up seven months after the war began, designed and built in 100 days and put into production the same year.

Although the AAF received two of the first Mustangs built and conducted extensive experimentation with the planes, the credit for the original design and construction goes to North American Aviation, Inc.

In April, 1940, the British asked North American to build on subcontract a fighter already in production by another company. North American countered with a proposal that an entirely new plane be created to incorporate the latest findings in aerodynamics and combat experience. The British agreed, providing a 120-day deadline could be met, an inline engine used and provisions made for specified armament.

The project was turned over to the company's engineering department. Edgar Schmued, chief design engineer, and his staff began work on a Saturday afternoon and worked all night to complete an inboard profile for inspection by the company president Sunday morning. This and a preliminary weight estimate were approved, and the company accepted the British deadline.

More than 2,800 original design drawings were needed, and the work of producing them was divided among specialists in power plant, landing gear, tail section, armament and the like.

From skeleton specifications, sketches, personal check-ups and constant revisions, the "specs" were finally turned out and sent to the experimental shop where a full-size wooden mock-up was being made by a crew working day and night, to the wind tunnel group which was carving a $20,000 quarter-size model from laminated mahogany to tolerance as fine as .001 of an inch, to loftsmen who were laying out the full-scale drawings from which the templates used in production were to be made, and to the purchasing department which rushed the parts on verbal instructions from Schmued.

Best known of the advanced ideas brought into the design was the so-called "laminar flow" wing, based on principles developed by NACA in extensive wind tunnel research. Schmued and Edward Horkey, young aerodynamic expert, believed in it thoroughly but a trick of circumstances almost negated their work. First wind tunnel tests indicated some bad stall characteristics, so they took the wing to a larger tunnel where it worked perfectly and became a major factor in the plane's speed.

The inline Allison was used to reduce the frontal area as much as possible. However, use of the liquid-cooled engine presented a problem in a large, drag-producing radiator scoop, usually placed in the nose. It was relocated underneath the fuselage. When, however, the engine heated up in flight tests, additional wind tunnel tests revealed that the turbulent boundary layer of air under the fuselage was entering the scoop and destroying the efficiency of the cooling system. By lowering the lip away from the bottom of the fuselage, engineers were able to sidetrack the turbulent air and attain circulation of "clean air."

Not all new ideas were successful. A semi-spherical, molded plastic windshield so distorted pilot vision that the regular flat windshield had to be substituted.

With a ton of engine and propeller in the nose exerting terrific forces in hard pullouts, bad landings and acrobatics, strength was essential. Pressure and weight tests of all kinds had to be made on the wings, including the piling of 80,000 pounds of weights on them.

A rumble caused by pulsations in the cooling air scoop was eliminated when the air scoop was lengthened and moved slightly outside the boundary layer of air close to the fuselage.

A streamlined radio mast that had worked perfectly on other planes vibrated badly and snapped off at the high speeds of the P-51. This was solved when an engineer took a steel tube, smashed it almost flat and installed it with the narrow axis in the direction of flight.

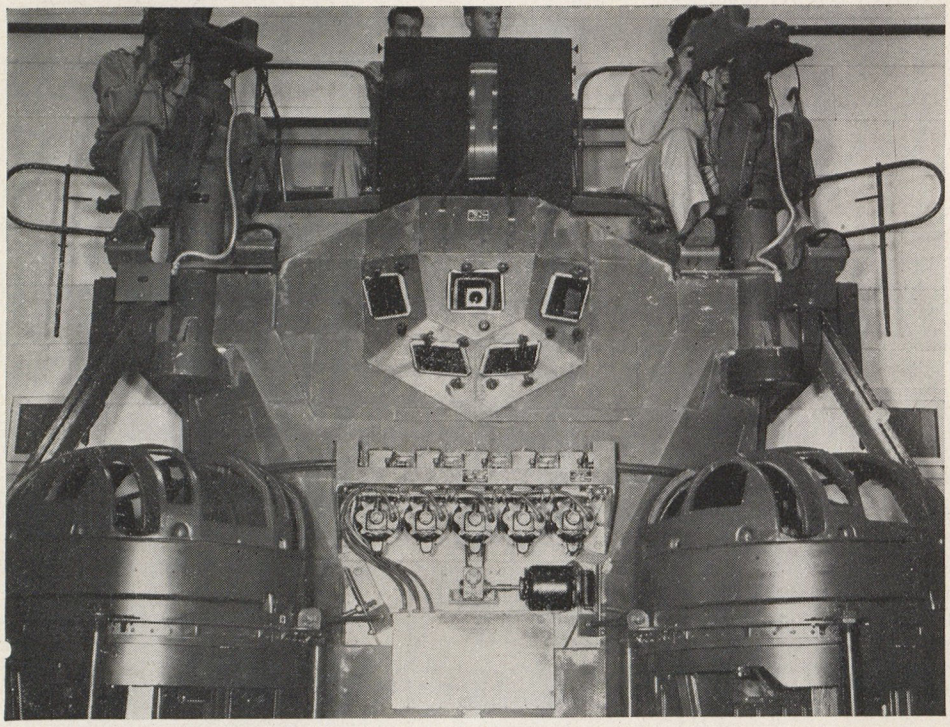
The finished product weighed approximately 8,000 pounds, with a wingspread of 37 feet and an over-all length of 32 feet.

The P-51 passed its factory flight tests successfully and on Armistice Day, 1941, made its first flight in England—but only after British anti-aircraft batteries had been warned of the appearance of a new fighter which closely resembled the Messerschmitt in silhouette.

Later, the Nazis were confused in identifying the new plane on its first flight over one of their airdromes, and they paid a heavy price.

And they are still paying. ☆

(Technique Continued)

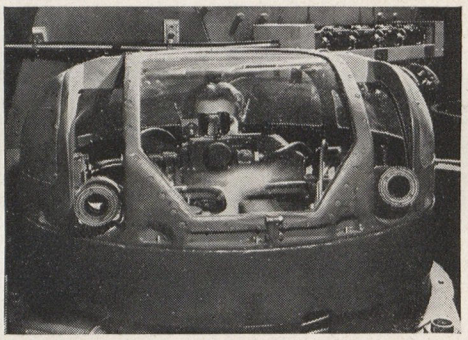


Front view shows instructor's position in upper center, two hand-held gun positions and two turret positions. In the center are the projection ports of the five projectors.

Waller Gunnery Trainer

Utilizing all the latest Hollywood technical features, the AAF has developed a dome-shaped gunnery trainer that simulates most actual combat conditions to be met in aerial warfare.

Dummy guns, mounted and weighted as .50-caliber machine guns, fire bursts of "light rays" at planes projected on a dome-shaped movie screen forty feet in diameter. Hits, bursts and rounds fired are recorded on electrical counters visible to the instructor. A bell rings in the students' earphones when his point of aim is on the nose.



A student (above) sights through the reflector sight of the Sperry upper turret. The aim-light projector is to be seen at the left of the sight. Note .50-caliber gun sleeves.

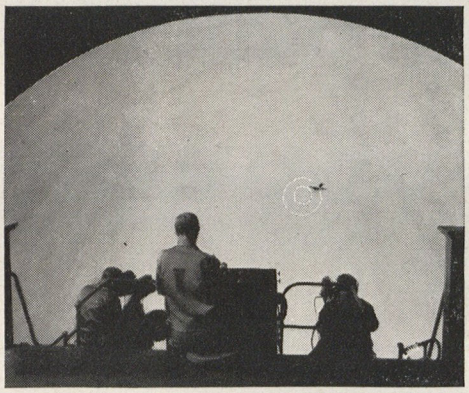
The unit is known as the Waller gunnery trainer for its inventor who also constructed the inner workings of the perisphere at the New York World's Fair.

Although intricate in design and construction, the trainer's operation is almost as realistic as actual aerial combat. Five 35 mm film projectors with sound tracks throw a composite picture of attacking combat planes on the screen. The sound tracks lend realism as the gunner hears the chatter of gunfire when he depresses the gun triggers.

Spots of colored light reveal where the guns are being aimed, photo-electric circuits control the angle of the "burst" and compensate for the lag from the time the gunner squeezes the trigger until the shells reach the target. Vibrators simulate actual conditions in firing.

Earphones keep the instructor constantly in contact with his four trainees, enabling him to coach them in their firing. When he wants to point out an error or illustrate a new point, he can freeze all action, stopping film, sound and firing but leaving the images clearly projected on the screen.

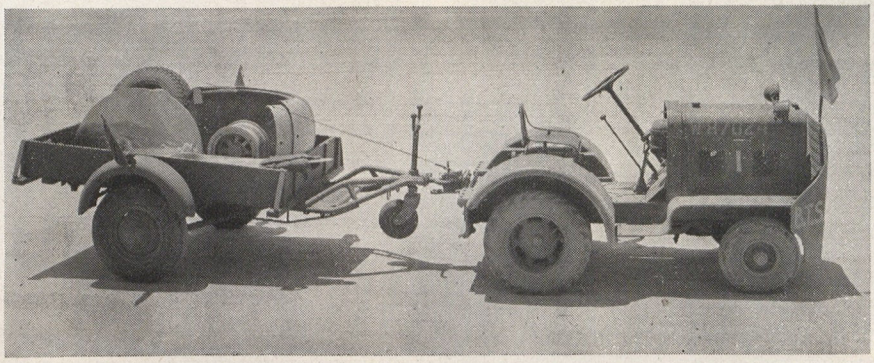
Power turrets are installed in two of the four gun positions.



This photo of the Waller gunnery trainer taken toward the spherical screen shows an instructor at the console and two upper gunners. An attacking plane appears on the screen. The circles superimposed on the plane show the correct position of the gunsight at that instant of the attack. In training, these aim circles appear intermittently to instruct the gunner in the correct point of aim. When the attacking plane appears on screen without the aim circles the gunners fire and their score is recorded.

Trailer Made from Standard Prop Dolly

This trailer, used by all squadrons at Roswell (N. Mex.) Army Air Field for hauling supplies to the line, was modified from a standard propeller dolly by moving the wheels forward to place them in the center of the trailer and replacing prongs and box with a wooden bed. Racks for two-bladed propellers may be installed over the wheels. — **Maj. John S. Loomis, CO, 91st Sub-Depot.**



The improvised bombardier trainer (above) made from salvaged materials by a B-26 squadron in North Africa. The "inventors" of the contraption are (left to right) Lieutenant G. K. Rhodes, Captain Joseph F. Perrin and Tech. Sgt. Herbert W. Eckhardt.

Training During Combat

A Rube-Goldberg contraption, composed of discarded gas pipe, a wheezy putt-putt, two twelve-volt batteries, a plumb line, an intervalometer from a B-26, a steering wheel from a five-ton truck, wheels, axles and assorted parts from wrecked jeeps, trailers and salvage dumps all over North Africa, has made an efficient bombardier trainer for a B-26 squadron in North Africa.

Like other bombing squadrons assigned to overseas duty, this unit discovered that while its pilots and navigators had been given plenty of practice ferrying their planes across, the bombardiers had become rusty on the operation of their bombsights.

Capt. Joseph F. Perrin, squadron bombardier, decided to tackle the problem. A makeshift practice device rigged on the back of an ordnance truck sufficed for awhile, but practice was continually interrupted when the truck was utilized for its prescribed purposes.

So to rig up the animated gas pipe giraffe shown in the accompanying photograph, Captain Perrin enlisted the aid of Lieut. G. K. Rhodes and Tech. Sgt. Herbert W. Eckhardt and they scoured the countryside for parts.

The seats came off a wrecked weapons carrier and the intervalometer from a B-26 that just managed to limp home from a mission over Tunisia. Two wheels and a platform were salvaged from a smashed trailer. A wrecked jeep supplied the other two wheels and an axle. The steering wheel with which the pilot "flies on course" came from a five-ton truck.

Most of the actual construction work was handled by Sergeant Eckhardt. In addition, he haunted the communications department until he was given the batteries needed for instrument impulse.

As a result of practice on this trainer the combat efficiency of the squadron was raised considerably, and the group CO ordered all bombardiers to take a certain number of hours a month on the trainer. Pilots, too, were ordered to practice on the contraption. **— Lieut. William Cook, Northwest African Strategic Air Force.**

Transparent Celestial Sphere

From two defective astro-domes, Lieut. Col. J. E. Davis, Wright Field, made this simple celestial sphere to facilitate study of navigational stars.

By looking through the transparent sphere, stars appear in the same relative positions as they do when looking skyward from the ground. Normal celestial spheres show the stars in reverse—as they would appear if you were in a position outside the universe.

After cementing the two navigational

domes together, Colonel Davis cut in the latitude and longitude lines and drilled holes in the exact position of the stars in rough magnitudes. A fluorescent material was then sealed into the holes. In a dark room the stars glow and appear to twinkle. Allegorical figures were etched on the constellations for purposes of instruction.

Tie-down System

A tie-down device using a chain and boomer has been in effective use at Pecos (Texas) Army Air Field, basic flying school, for several months. It consists of two rings set in concrete through which a chain with a hook at both ends is passed. After attaching the hooks to the towing rings of the aircraft, the slack is taken up by throwing the boomer which locks automatically. A ring is also set in concrete to correspond with the tie-down ring of the plane's tail section. A one-half inch rope through both rings serves this purpose.

During severe windstorms the device proved its merit as a safety system. Pressure in the tires tends to relieve strain and makes these tie-downs flexible from three-fourths to one and one-fourth inches.

The device was introduced by Col. Harry C. Wisehart, commandant of the field, and designed by post engineers under the supervision of Maj. Harry L. Stebbins. **— PRO, WFTC.**

Always in Place

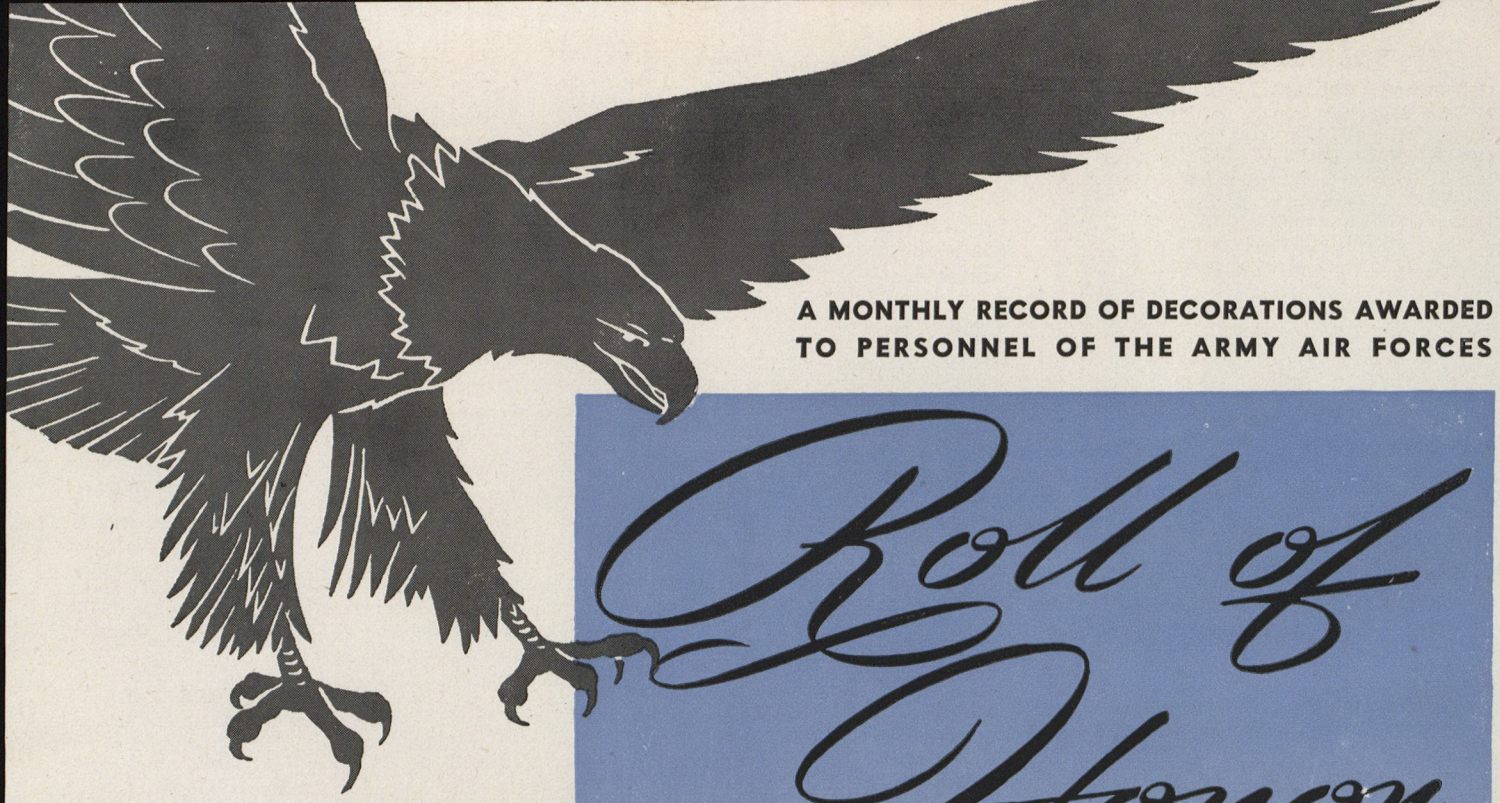
A refinement has been worked out on the standard portable engine hoist at the 59th Sub-Depot, Lowry Field, Colo., to give ready access to the crossbar, which connects the lower ends of the front legs, and to have it always available.

The crossbar is connected permanently to the vertical leg by a chain on a piece of cable. **— Lieut. Col. R. S. Smilie, CO, 59th Sub-Depot.**

New Bearing Packer

A wheel bearing packer, an easily operated device constructed entirely of spare parts, is the invention of Tech. Sgt. Jack Baity (below) 326th Basic Flying Training Squadron, Minter Field, Calif. The principal feature of the device consists of a cup fitted on a grease gun which is set on a base. The bearing is placed in the cup and a handle pressed down forcing the new grease upward and removing the old lubricant and cleaning solvent.

The packer which will grease all sizes of bearings, represents a saving of one-third on lubricating compounds, as well as a considerable amount of time. **— PRO, WFTC.** ☆



A MONTHLY RECORD OF DECORATIONS AWARDED TO PERSONNEL OF THE ARMY AIR FORCES

Roll of Honor

MEDAL OF HONOR

COLONELS: Leon William Johnson, John Roger Kane (Also Silver Star and Distinguished Flying Cross).

DISTINGUISHED SERVICE CROSS

BRIGADIER GENERAL Frank A. Armstrong. **MAJOR** Thomas J. Classen. **CAPTAINS:** Gerald J. Crosson (Also Distinguished Flying Cross), Cecil C. Duncan (Also Distinguished Flying Cross and nine Oak Leaf Clusters to Air Medal), Frederick F. Wesche, 3d (Also Silver Star, Distinguished Flying Cross and Air Medal). **LIEUTENANTS:** Robert J. Dorwart, Murray J. Shubin. **STAFF SERGEANT** John R. Roller.

DISTINGUISHED SERVICE MEDAL

MAJOR GENERAL James H. Doolittle. **BRIGADIER GENERAL** Orvil A. Anderson. **COLONELS:** Charles B. B. Bubb, Benjamin S. Kelsey, Paul H. Prentiss, Walter S. Smith*.

OAK LEAF CLUSTER TO DISTINGUISHED SERVICE MEDAL

LIEUTENANT GENERAL Frank M. Andrews*. **BRIGADIER GENERAL** Uzal G. Ent.

LEGION OF MERIT

MAJOR GENERAL Ira C. Eaker. **BRIGADIER GENERALS:** Francis M. Brady, Howard A. Craig, Asa N. Duncan, Haywood S. Hansell, Jr., Laurence S. Kuter, Paul L. Williams. **MAJOR** Jerome W. Jackson. **MASTER SERGEANTS:** John S. Eubanks, Howard F. Nutting, Edmund G. Robinson, Carl H. Russell, Steve Taylor. **TECHNICAL SERGEANTS:** Everett K. Bloomfield, Kenymore K. Cover, Alexander Erosky, Henry P. Mac Neill, Woodrow E. O'Brien. **STAFF SERGEANTS:** James P. McGloin, Arthur L. Olson, Arthur C. Robinson. **SERGEANTS:** Kenneth E. Atwell, Joseph Cibella, Fred S. Crane, Louis Criscuolo, William H. Davey, Harold J. Day.

SILVER STAR

BRIGADIER GENERAL Joseph H. Atkinson (Also Air Medal with Oak Leaf Cluster). **COLONELS:** John C. Crosthwaite, Carlyle H. Ridenour, James H. Walsh. **LIEUTENANT COLONEL** Dale D. Brannon (Also Distinguished Flying Cross). **MAJOR** Delwin B. Avery (Also Purple Heart, Distinguished Flying Cross and ten Oak Leaf Clusters to Air Medal). **CAPTAINS:** Blair M. Sorensen, George S. Welch (Also Distinguished Flying Cross and Air Medal). **LIEUTENANTS:** Stanley O. Andrews, Peter M. Childress, Eugene B. Davis, Allan P. Forsyth (Also Air Medal), Byron H. Gilmore, Lynwood M. Glazier, John F. Keith, Robert S. Miller, Donald Scullion, Harry R. Sengle. **MASTER SERGEANTS:** Francis A. Klaiber, Harry Urban. **TECHNICAL SERGEANT** Donald O. Martin. **STAFF SERGEANTS:** John C. Caputo, Dominick J. Genard, Robert T. Jungbluth, William H. Schiffer. **SERGEANTS:** Howard Cantor (Also Distinguished Flying Cross and Air Medal), William T. Gleason (Also Distinguished Flying Cross), Isaac Kaplan. **AVIATION CADET** Charles F. Buchholz.

* Posthumous

OAK LEAF CLUSTER TO SILVER STAR

LIEUTENANT William G. Bennett* (Also Air Medal*). **SERGEANT** William H. Nichols.

PURPLE HEART

LIEUTENANT COLONEL Curtis Low. **MAJOR** Albert Zipser (Also Distinguished Flying Cross and Air Medal with eight Oak Leaf Clusters). **CAPTAIN** William H. Wemmer. **LIEUTENANTS:** John Jarvis Cape, Jr., William M. Carrithers, Jesse H. Elliott (Also Distinguished Flying Cross and Air Medal with three Oak Leaf Clusters), Jerome L. Foreman (Also Distinguished Flying Cross*), Lawrence Greensides, John W. Norvell, Harold R. Taylor. **MASTER SERGEANT** Kenneth Lawton. **TECHNICAL SERGEANTS:** Ray Armstrong (Also Air Medal with three Oak Leaf Clusters), David B. Hatch (Also Air Medal). **STAFF SERGEANTS:** Edward Denning, Lawrence E. Dennis. **CORPORAL** Robert G. Thomas. **PRIVATES FIRST CLASS:** James J. Gleason*, James I. Lewis*, Thomas F. Philipsky*. **PRIVATE:** Brooks J. Brubaker*.

DISTINGUISHED FLYING CROSS

BRIGADIER GENERAL James Pratt Hodges. **COLONELS:** Edward H. Alexander, Bernt Balchen, Neil B. Harding. **LIEUTENANT COLONELS:** John Cerny, Robert E. Condon, Felix M. Hardison (Also Air Medal), Boyd T. Hubbard, Jr., Andrew A. Meulenberg. **MAJORS:** Karl T. Barthelmess, Anthony Benvenuto*, Owen F. Clarke, Edgar W. Hampton, Grant Mahony (Also Air Medal with Oak Leaf Cluster). **CAPTAINS:** John Andrews, William J. Casey (Also Air Medal with Oak Leaf Cluster), George H. Davidson, Jr. (Also Air Medal), Paul A. Dorney, Lee C. Holloway, Virgil Ingram, Jr.*, James G. Kandaras (Also Oak Leaf Cluster to Air Medal), Andrew H. Price (With Oak Leaf Cluster), Richard Spotswood Smith (Also Air Medal), Clyde H. Webb, Jr.* (Also Air Medal*). **LIEUTENANTS:** Sylvan Feld, Durward W. Fesmire (Also Air Medal), Charles F. Franklin, James W. Ingram, Edward M. Jacquet (With Oak Leaf Cluster), Vincent Puglisi (Also Air Medal with eleven Oak Leaf Clusters), Perry H. Penn, Isaac W. Smith, Edward T. Solomon, Coleman Stripling (Also Air Medal). **MASTER SERGEANT** Eldon W. Audiss (Also Air Medal with three Oak Leaf Clusters). **TECHNICAL SERGEANTS:** Bud W. Cook, Darrell D. Loy. **STAFF SERGEANTS:** Wayman E. Curry, William E. Gustafon*, Vernon F. Portman, William T. Surgeson (Also Air Medal). **SERGEANTS:** Joe C. Corley, Jr., Kenneth R. De Long (Also Air Medal with Oak Leaf Cluster), John B. Moore (Also Air Medal), Raymond M. Vail. **CORPORALS:** William S. Bates, Marvin D. Middleton, George H. Logan, Santino M. Scolari. **PRIVATES FIRST CLASS:** Lester C. Berryman, Joseph T. McIlvain, Lawrence E. Raley. **PRIVATE** Ralph R. Simons. **AVIATION CADET** James K. Connolly (Also Air Medal).

SOLDIER'S MEDAL

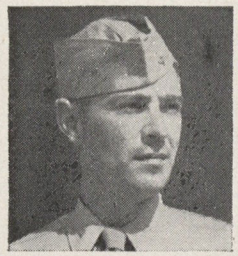
LIEUTENANT COLONEL Jeremiah A. Chase. **MAJOR** Mark E. Conan. **CAPTAINS:** Charles Stone, Harold L. Strong, John C. Wagner. **LIEUTENANTS:** Charles W. Byrd, James Congleton, Jr., Robert D. Lauer. **MASTER SERGEANTS:** Eigel W. Christensen, Dellyous C. Taylor. **TECHNICAL SERGEANTS:** Val Julius Boisdore, James H. Kingsley. **STAFF SERGEANTS:** Robert L. Capel, Albert A. Cattadoris, Carl T. De Angelo, George H. Slemp, Don T. Tetley. **SERGEANTS:** Harold E. Hawkins, William A. Stone. **CORPORALS:** Joseph A. Czajkowski, Morris Mesnik. **PRIVATE** Thomas H. Capel. **AVIATION CADET** Joseph Silva.

AIR MEDAL

MAJOR GENERAL Lewis Brereton. **COLONELS:** Lawrence G. Fritz, Robert M. Love, Lauris Norstad, William R. Sweeley. **LIEUTENANT COLONEL** Samuel Charles Gurney. **MAJORS:** Dalene E. Bailey, Willard A. Fountain, Jacob W. Fredericks (With Oak Leaf Cluster), Otha B. Hardy, Jr., Payne Jennings, Jr., John J. Smith, Jr., Earl Raymond Tash. **CAPTAINS:** Homer E. Adams, Joe P. Baird, Richard P. Belden, Harold A. Bullock, Louis D. Chandler, Roderick G. Darelius, Robert J. Duval, Channing Burton Emberson, Richard F. Ginther, James J. Griffith, John F. Hampshire (With Oak Leaf Cluster*), Melvin A. McKenzie, Horace B. McWhirter, Franklin A. Nichols, Henry A. Orban, John J. Owen, Jr., Delmar J. Rogers, William H. Smith, James F. Starkey, David B. Taggart, Lewis W. Tanner, Everett E. Tribbett (With Oak Leaf Cluster), John I. Turnbull, James Phillip Walker (With Oak Leaf Cluster). **LIEUTENANTS:** John H. Adams, Jr., William B. Adams, Jr. (With Oak Leaf Cluster), Harold C. Brasher, Walter H. Brickett, William K. Britton, Lester W. Brock, Laverne D. Brockman, Addison L. Brown, Marvin H. Bryant, William H. Bryant, Bill Buckingham, George D. Burges, James R. Burgett, III, Donald J. Burkey, Charles D. Burpee, Jr., Claude S. Burtnette, Jr., Titus M. Bush, Donald J. Calhoon, Henry S. Cantrell, Othen Nelson Carlos, Francis B. Carlson, George W. Caulkett, John H. Chalmers, Eldon A. Chappell, William R. Charnley, Hays H. Clemens, Donald V. Coakley, Oscar M. Coe, Jr., Irving T. Colburn (With Oak Leaf Cluster), James E. Compton, Ralph B. Conner, Paul F. Conroy, Robert L. Kleyla, Andrew Kundrat, Anthony L. Leal, James O. Levine, Stanley A. Long (With Oak Leaf Cluster), Harold C. Mc Auliff, Frederick L. Manthe, Harold E. Mitts, John Byrd Murphy, Harold W. Norton, Ashley S. Orr, Harry Owen Patteson, William W. Potter, Jr., John J. Pozerycki, Earl W. Quillman, John B. Roberts, Gerald Talbot Rogers, George A. Rush, William J. Ryan, Verl B. Schoenfeldt, Carl E. Schultz (With Oak Leaf Cluster), Henry H. Schwane, Chris J. Sheppard, Frederick B. Short (With two Oak Leaf Clusters), Richard J. Sierks, Jerome C. Simpson (With three Oak Leaf Clusters), Dorothy P. Shikoski, Edmund G. Smith, Herschel L. Smith, Wilfred L. Smith, Allen W. Snook, William G. Solomon, III, Clarence R. Stampley, Paul Stanch, Russell E. Stevens, Jr., Lucian H. Steyn, Wayne A. Stover, Malcolm Baker Sturgis, John C. Summers, Paul M. Thomas (With three Oak Leaf Clusters), Wilfred N. Turcotte, Harold J. Van Cott, Theodore J. Van Kirk, Ralph L. Vincent, Gordon F. Voght, Otto H. Wellensiek, Wallace D. White, Ralph B. Wildenhaus, Charles R. Wiley, John Sheffield Williamson, Jr., Richard A. Yorke, Louis S. Zamperini. **TECHNICAL SERGEANTS:** William E. Abraham, Francis M. Counselman, Frank M. Ketron (With Oak Leaf Cluster), Joseph Markiewicz*, Guy T. Padgett, Leonard A. Putnam, Harold R. Romer (With Oak Leaf Cluster), Robert H. Williams, Ned M. Woolsey. **STAFF SERGEANTS:** Stephen Gogolya, Merwin A. Griffiths, Clifton W. Groelz, Gervase C. Hollander, Glen E. Justice, Stephen S. Koslowski, Herman T. O. McLelland, James W. Mansfield, Stanley F. Marek, Augustine F. Mazzaccaro, Patsy Micacchione, James Morrissey (With Oak Leaf Cluster), Lawrence W. Nearman, Arthur E. Norgaard, Robert B. Norton, Barney Old Coyote, Jr., Clarence W. O'Neill, Theodore B. O'Shields, Carl E. Owen, David T. Owens, Herman S. Pacheco, Jr., James D. Pruitt, Jr., Norman A. Riggs, Douglas V. Radney, Thurman H. Russell, Harold A. Shaber, Chester F. Shedlebower, Douglas M. Shutes, Carl H. Skinner, Frederick H. Sparks. **SERGEANTS:** John B. Byars, Leslie E. Cain, Thomas W. Crook, Jr., John H. Crowder, Ted R. Groce, George A. Mendel, Robert M. Moffitt, Carl E. Olson, Guy E. Parker, Philip A. Price, Gerard A. Pusch, Robert Spaulding, John P. Wilson. **AVIATION CADET** George A. Wangler.

OAK LEAF CLUSTERS TO AIR MEDAL

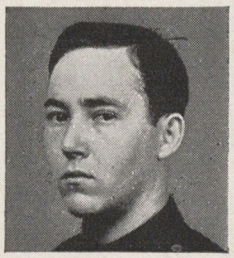
COLONEL Bruce K. Holloway. **MAJOR** William A. Lanford. **CAPTAIN** Donald L. McKay (2nd). **LIEUTENANTS:** Arthur Eugene Aenchbacker (3rd), William J. Anderson (2nd), John R. Bannon (3rd), Junior M. Barney, Frank R. Beadle (2nd), Clarence L. Harmon. **SERGEANTS:** James M. Abbott (3rd), Elmer O. Almy, Abraham Todras (2nd). ☆



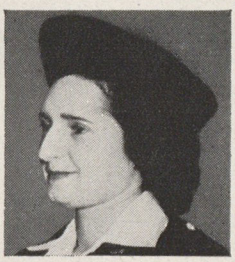
A/C Chas. F. Buchholz

Col. E. H. Alexander

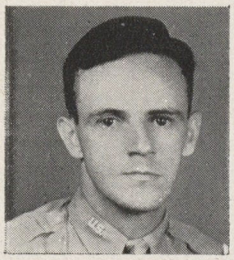
Lt. R. S. Miller



Lt. Perry H. Penn

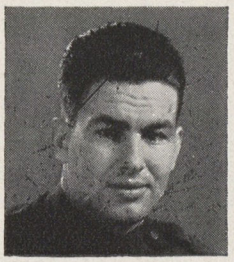


Lt. Dorothy P. Shikoski

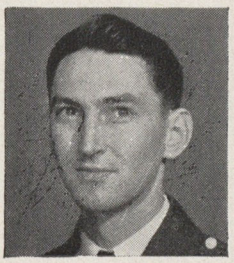


Col. James H. Walsh

Lt. Charles W. Byrd

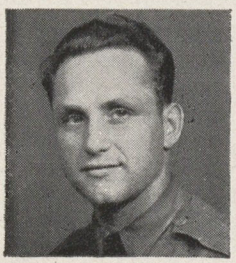


Lt. Isaac W. Smith



Major E. W. Hampton

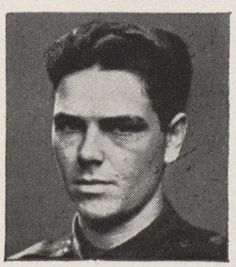
Lt. Col. Curtis Low



Lt. James W. Ingram

Lt. John W. Norvell

Lt. Allan P. Forsyth



Major Grant Mahony

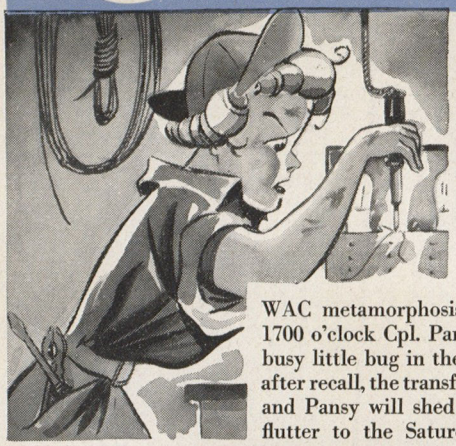
Sgt. Howard Cantor

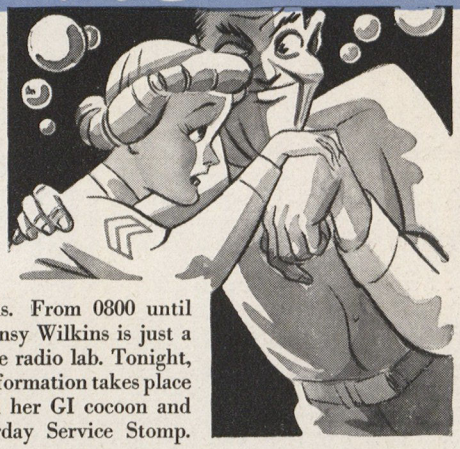
WOMEN'S ARMY CORPS

WAC

US

By Lieut. Wm. T. Lent

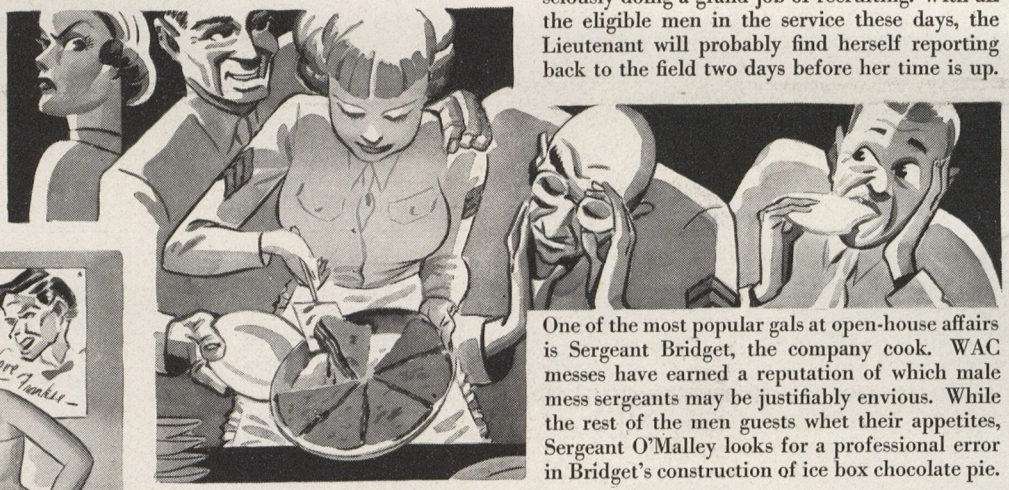




WAC metamorphosis. From 0800 until 1700 o'clock Cpl. Pansy Wilkins is just a busy little bug in the radio lab. Tonight, after recall, the transformation takes place and Pansy will shed her GI cocoon and flutter to the Saturday Service Stomp.

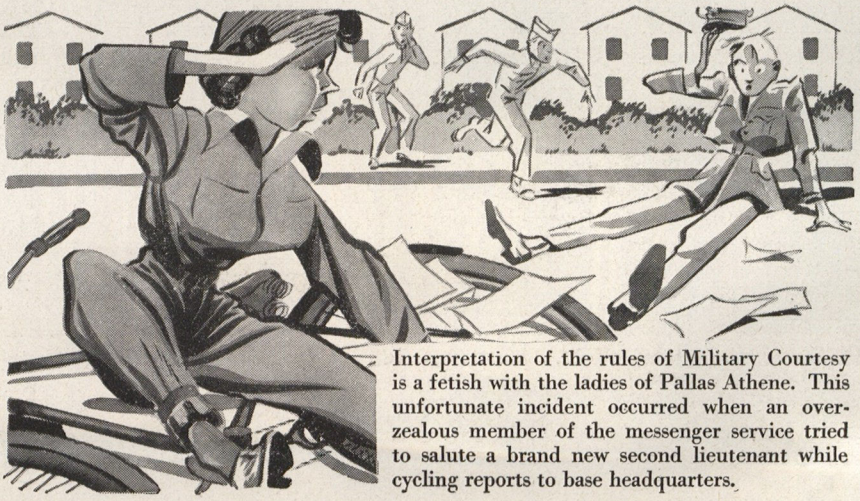
Lieutenant Sanders got her long-awaited furlough and here she is back in the old home town, unconsciously doing a grand job of recruiting. With all the eligible men in the service these days, the Lieutenant will probably find herself reporting back to the field two days before her time is up.

Brother, if you don't think the girls have some sharp drill teams, you're badly mistaken. Sergeant Johnson once led the chorus line at Radio City and now she pours precision close-order to her company with all the old showmanship.



One of the most popular gals at open-house affairs is Sergeant Bridget, the company cook. WAC messes have earned a reputation of which male mess sergeants may be justifiably envious. While the rest of the men guests whet their appetites, Sergeant O'Malley looks for a professional error in Bridget's construction of ice box chocolate pie.

Private Peters, ex-society deb, nurses a pair of tired tootsies (as yet uncalloused to the 30-inch step in service slippers) while her roommate struggles to take the bends out of her 8.2 cast-iron skirt.



Interpretation of the rules of Military Courtesy is a fetish with the ladies of Pallas Athene. This unfortunate incident occurred when an overzealous member of the messenger service tried to salute a brand new second lieutenant while cycling reports to base headquarters.

Notes on the AIRCRAFT WARNING SERVICE

MEMO FOR RECOGNITION STUDENTS. There is a difference in the terms "recognition" and "identification" of aircraft. When a plane is reported and plotted on filter boards it is known as a "target." This target must be *identified* as friendly or enemy. When aircraft is sighted by pilots or observers it is *recognized* as a particular type of aircraft, such as B-24, P-47, etc. Identification determines aircraft as friendly or enemy; recognition determines the types.

GOC AND AWC. Two volunteer corps, each accorded official recognition by the Army, now serve the Army Air Forces in the Aircraft Warning Service in this country: the Ground Observer Corps and the newly designated Aircraft Warning Corps, whose members include filterers, plotters, tellers and supervisors who work for the fighter commands of the AAF.

NOT JUST PLANES BUT STARS, TOO. Members of the Ground Observer Corps in certain areas are assisting in the progress of scientific research in addition to their regular duties in behalf of the defense of the American mainland. In short, the Aurora Borealis is as eagerly looked for in certain localities as a Focke-Wulf, a Messerschmitt or a Dornier—and the anticipation is much more pleasant.

The National Geographic Society and Cornell University have asked the GOC to assist them in a research project concerning the Aurora Borealis, the purpose of which is to acquire data for the use of the armed forces in the field of radio communications. They approached the GOC because nowhere else in this country is there such a far-reaching organization already set up and in a position to report Auroras over such a wide territory. Observers who pursue this venture into the realm of astronomy will deal directly with Cornell University. (From the 1st Fighter Command's "AWS Volunteer.")

'EYES ALOFT. On the west coast the 4th Fighter Command's network radio program, "Eyes Aloft" recently celebrated its first anniversary on the air. The half-hour show, dramatizing the activities of the Aircraft Warning Service and the 4th Fighter Command, is written and produced by Robert L. Redd and is heard over Pacific Coast NBC Monday evenings at 1830 PWT. Redd, who originated the show and Sam Hayes, veteran radio announcer and commentator, volunteer their time to the AWS for this job.

When the problem of recruiting new volunteers in the Aircraft Warning Corps became acute, Hayes used his vacation to fly up and down the west coast on a busman's holiday, speaking before crowds on the subject of the AWS and its importance in the war. He contributed his time and services to the Air Forces for this venture, and charged only for the vast quantities of aspirin he had to consume on his 14-day jaunt. He visited 14 different cities, made 72 broadcast appeals, 102 personal appearances and recruited more than 3,000 new filter workers.

COSTUME JEWELRY. More than two tons of the costume jewelry collected by the volunteers of the Los Angeles Fighter Wing have been sent overseas to be used by AAF men in bartering with the natives. Pilots returning from Pacific zones tell of the aid a few pieces of this jewelry bring from the natives when flyers are forced down on a remote island.

GO AWAY. The usual down-to-business tension in AWS filter centers in the 1st Fighter Command, is relieved now and then by an incident worth a real chuckle. Recently a new volunteer in the Richmond, Va., center became flustered by the number of reports coming in to her position on the board. Instead of the orthodox, "Army, go ahead, please," the observer at the other end of the wire heard the plea, "Army, go *away*, please."

A NEW CONVERT. Among the Army's most resourceful men are the sector sergeants assigned to the AAF's Ground Observer Corps. They have to be, for not infrequently they run into snags that call for all the ingenuity they can muster. We have just heard about one such instance. A tale that is going the rounds of the 4th Fighter Command.

It seems that a particularly conscientious sector sergeant in the Los Angeles Fighter Wing thought it would be a fine, educational, morale-building idea for the ground observers to visit the Army's filter and information centers and actually see the complex operations that are set into motion by the observers' telephoned reports of aircraft seen or heard. Accordingly, he arranged to pick up in a GI carryall a certain number of volunteer observers from posts in his particular area every Monday night, take them first to the "Eyes Aloft" broadcast and then over to the Los Angeles Information Center.

Everything went smoothly for the first couple of weeks. Then one night an MP officer happened to be walking along Sunset Boulevard in Hollywood at the exact instant the sergeant drew up in front of the NBC studios to deposit his charges on the sidewalk—as many as could conceivably be squeezed into the carryall. The relations between a sector sergeant and his volunteer observers are, to speak conservatively, informal at best and on this particular evening the whole mise-en-scène was anything but military. The volunteers, most of them women. were clearly having a wonderful time. They called the sergeant by his first name, they assumed a definitely proprietary air toward the vehicle itself, and they shouted and screamed with glee as they all piled out of the machine.

The officer was brought up short by this slap-happy scene.

"Sergeant!" he shouted, "Don't you know it's a serious violation of the regulations to carry civilians in a government vehicle?"

"Yes sir," confessed the unhappy sergeant.

"Then I shall have to order your arrest."

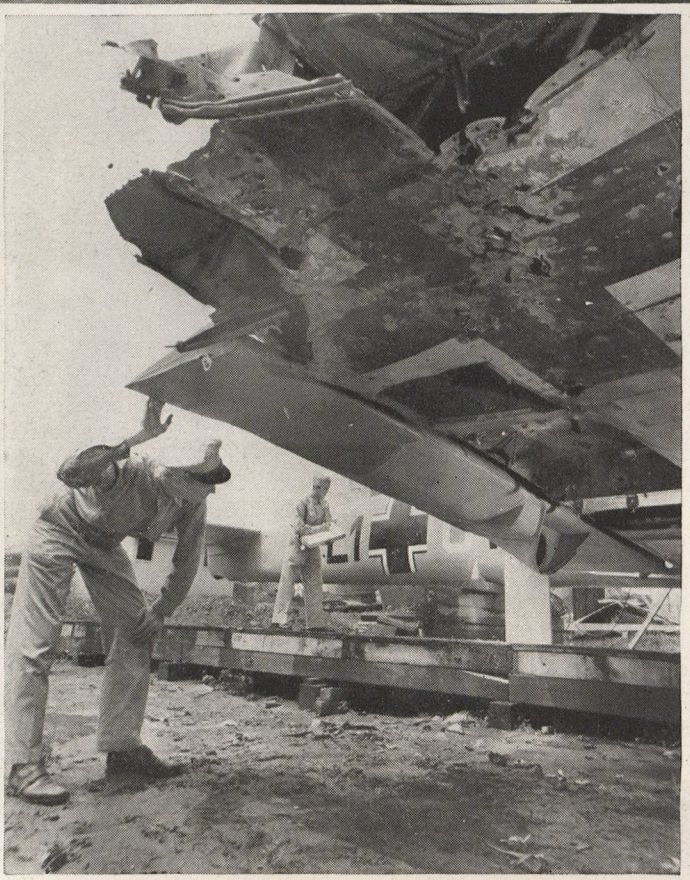
"But, you see, sir," the sergeant protested, "these people are not civilians, they are *ground observers.*"

The story has a true Hollywood ending. The captain, who turned out to be the Provost Marshal for a large AAF station nearby, followed the crowd into the studio, became fascinated with a phase of the Army hitherto unknown to him, asked to accompany the group on a cook's tour of the I. C. and later drove back with them to inspect their posts—the first he had ever seen. Like everyone who first discovers the AWS, he "got religion" where it is concerned, and not only did he encourage the sergeant in his weekly enterprise and issue instructions to his MPs in the vicinity that cars bearing ground observers were not to be questioned in the future, but now, every Monday night he brings his own carload of volunteers to the "Eyes Aloft" broadcast. ☆

Dead Planes

By Capt. Robert V. Guelich

How our engineers give all articles of captured enemy equipment a third-degree examination—and what they learn.



A captured ME-110 is given a onceover (top and left). Beneath the hood of the ME-109F (below) can be seen flame dampener exhaust stacks, prestone (large) and hydraulic (small) fuel tanks, 7.9 mm machine gun, and valves of the hydraulic system mounted on the fire wall.

Can Talk

IN the early stages of the war, Germany captured much British and American-made equipment in France. Japan likewise captured wrecked American aircraft and other materiel in the Philippines. They had the first opportunity to learn that dead men can't talk but dead airplanes can and do. These early war losses contributed greatly to the enemy's knowledge of many of our aircraft secrets.

Since those days of Axis offensives, hundreds of Jap, Italian and German planes have been captured by the United Nations. We now are gathering captured enemy aircraft parts from all war theatres, assembling and testing equipment to learn what progress the enemy is making in aircraft design and development.

Because no one group of engineers is able to dream up all of the best aircraft developments all of the time, AAF engineers examine the most recent equipment being used by the enemy—searching for design and construction details that might be applicable to our own warplanes. From reports on these tests, technicians of the Materiel Command's engineering laboratories keep up-to-date charts of the progress of enemy aircraft development.

Commenting on the results of these continuing studies, Lieut. Col. John M. Hayward, chief of the technical data laboratory at Wright Field, states: "From thorough analysis of enemy equipment, we have learned that American equipment basically is superior to that of the enemy. Nevertheless, we do not claim an absolute monopoly on all of the best ideas. Our job is to recognize and use ingenuity and engineering ability of the enemy, weighing the benefits of engineering compromises in order to take advantage of the best available ideas."

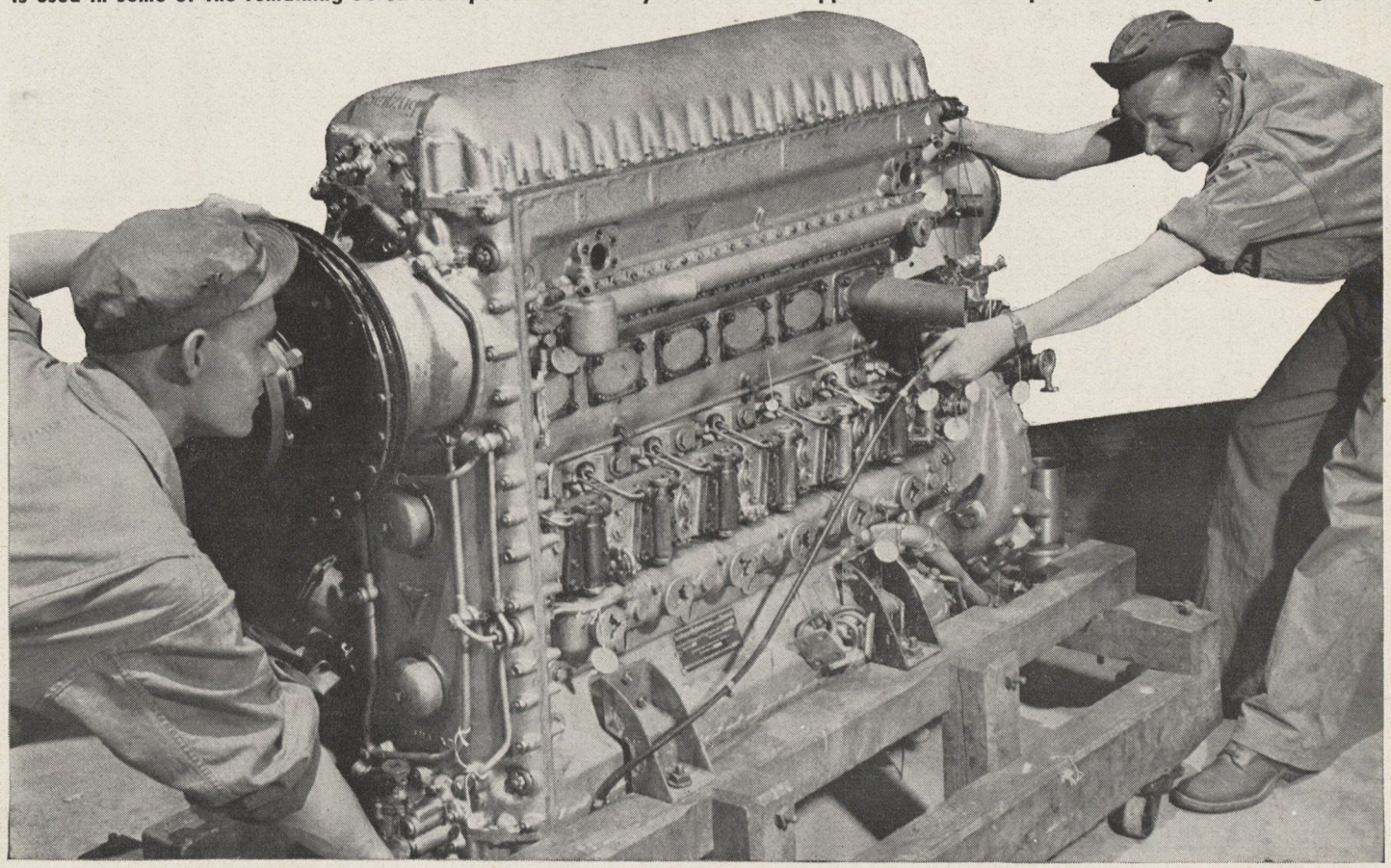
Since a story of the "bests" in all types of aircraft might read like a propaganda release—because of general superiority of American and Allied equipment — this article is intended to be a frank appraisal of German, Jap and Italian equipment with particular emphasis on that enemy equipment which is relatively new or which compares favorably with that being used by the AAF.

Here are some typical examples. When a German device was found to facilitate detachment of the propeller spinner for repair, it immediately was adapted for test on American-built spinners. German air filters have contributed to development of American filters. Despite the general inferiority of Jap equipment, one refinement discovered on a Jap automatic pilot has been applied to new American types. A Jap one-hitch parachute harness clamp also is being adapted for testing and possible use by the AAF.

Some of the devices incorporated in enemy aircraft are very clever, even though they may lack practicability in warplanes. Outstanding in this classification is a Rube Goldberg instrument panel found in an Italian plane.

UTILIZING mirrors, prisms and lenses, the readings of the flight instruments are projected on a ground-glass screen which enables concentration of five instrument dials in a rectangle approximating 3 inches by 6 inches. Although not new in principle, this type of panel is impractical for a warplane because all of the projection equipment is extra weight and because our present instrument panels have been standardized and have proved satis-

This Jumo 205 German diesel engine is being taken into a test chamber at Wright Field. The engine is rated at about 600 hp and is used in some of the remaining JU-52 transports and in many of the Dornier flying boats, where they are installed back-to-back for tractor and pusher props. It is a six-cylinder power plant with vertical opposed two-stroke pistons and compression ignition.



factory. Instruments concentrated on the screen in the Italian plane are the compass, air speed, climb, bank and turn indicators.

Chrome plating and white enamel decorate the panel. (A flair for decorative touches is prevalent in most Italian equipment.) In another plane, the guns have chromium plated handle grips.

In comparing American instruments with those of the enemy, it has been discovered that Japanese instruments usually are lighter in weight than those in AAF planes although their performance is not comparable to American instruments under temperature, pressure and other variables. Nevertheless, some Jap copies have been found to be almost exact duplicates of American equipment.

Conclusion of one report on Jap flight instruments reads:

1. The ..... instruments have no new design features.
2. Jap instruments are much inferior to present American instruments in regard to performance.
3. In general, Jap instruments are about the same quality as those used in this country ter to fifteen years ago.

None of the more recent American refinements have been found on Jap instruments and very few have been discovered on German instruments, which, however, are of a more original design.

Plastic cases are being used by all countries to house instruments, except when metal sheeting is desirable on electrical instruments. The Japs have been using all types of metal, aluminum, brass, steel—apparently whatever was available at the time of manufacture.

To facilitate maintenance and repair, some German instruments have carried schematic wiring diagrams on the outside of the case, another instance of German attention to the problems of maintenance.

Propeller development has been a field for many innovations in Germany. The Nazis seem to enjoy developing complicated pitch change devices such as that of the Argus propeller.

In this propeller, which is made of laminated wood, pitch change is accomplished mechanically by the wind striking the fins of a windmill type of spinner. As the air speed increases, the rotatable spinner derives more resistance from the air and thereby increases the pitch. This propeller, only observed on 450 horsepower engines, appears to work satisfactorily on such engines. The Germans use no hollow steel propellers. Most are made of laminated wood, the rest of dural. The wood props have a cellulose acetate covering with brass or copper on the leading edge to protect the blade from chipping.

German propeller accessories are very good, being particularly designed for easy maintenance. Japanese propellers are mostly of a high quality dural and are almost exact duplicates of our older Hamilton-Standard props.

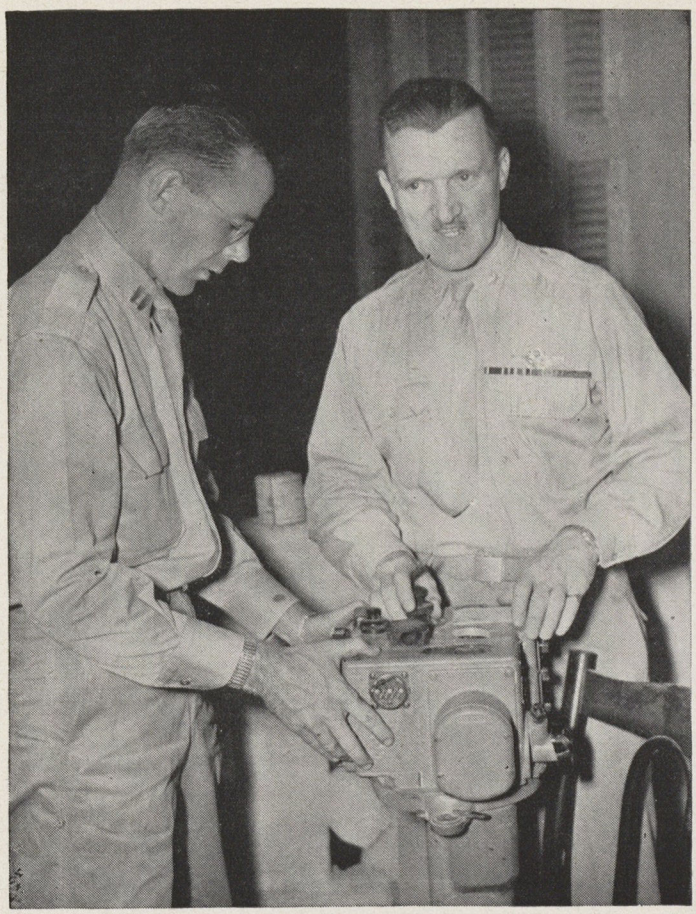
In the field of armament, the Germans are using very good guns and both Germans and Japs are using good ammunition.

The Mauser MG-151 20 mm cannon is one of the outstanding 20 mm aircraft cannons used in this war. It fires 800 to 900 rounds per minute—faster than similar guns originally installed in American warplanes.

Although the Japs and Germans are beginning to use 13 mm guns, they apparently continue to lag in development. Our .50 caliber machine guns are far better than the .30 calibers still used by the Axis nations. One of the only .50 caliber range guns in use by the Axis is an Italian Breda 12.7 mm. This appears to be a scaled-up

Firepower of enemy guns is tested at Wright Field. Weapons shown here include (left to right) Italian Breda 8 mm flexible machine gun (held by sergeant), Breda 12.7 mm (flexible), Breda 7.7 mm (flexible), German 7.9 mm (flexible), another Breda 7.7 mm, German Oerlikon 20 mm fixed cannon, Oerlikon 20 mm flexible cannon, two German MG-17 7.9 mm fixed machine guns, Jap 7.9 flexible machine gun and an AAF .50 caliber machine gun.

The pitch of these German Argus prop blades is controlled automatically by the ribbed rotable spinner which reacts with changes in air speed. Wooden-bladed, the prop is used on low-power engines.



Brig. Gen. Victor H. Strahm (right) and Capt. Selby M. Frank inspect a German bombsight—a Lotfe 7C type (Carl Zeiss), weighing about sixty pounds. It is crudely constructed, compared to the Norden, and the quality of stabilization—by electrical dampers—is doubtful. The optics, however, are especially fine.

This is an 840 hp, two-row, 14-cylinder, radial air-cooled Italian Fiat engine. It has a geared supercharger and is used to power such planes as the Macchi 200 fighter, the Fiat G-50 fighter, the CR-42 biplane and RS-14 bomber-reconnaissance seaplane.

version of the Breda 7.9—a modified Vickers Mark I. It is a little more than a .30 caliber gun doubled in size with little redesign of the internal mechanisms. The powder capacity of the shell is about one-half that of the American .50.

The Oerlikon 20 mm, used by Japs and Germans, is fairly light in weight but is believed to have a slower muzzle velocity than comparable American guns. The Jap 7.7 mm gun is a copy of a British Vickers used in the last war.

Although not used in aircraft, it is interesting to observe that Italian and Japanese .25 to .30 caliber ammunition has been found using a hard wood projectile which appears to be effective at short range.

Turret development of the enemy appears to be far behind that of the United Nations. The Germans have sent some rather ineffective looking semi-turrets into action, some of which are operated by remote control. The Japs seem to be depending upon the Lewis and Vickers Model 3 flexible mounts.

Captured bombsights have been generally good but not comparable to our best. Of the German Type 7-C, built by Zeiss, the Materiel Command report reads, "This type bombsight contains nothing in nature of design which would be an improvement to our system." A Jap Nikko bombsight from a Mitsubishi Type 96 Navy bomber shot down near Darwin was reported to be very similar to the French Bronzavia Devaud Type D-30 bombsight.

Enemy aircraft engines of all types have been captured and returned to Wright Field for careful analysis and rigid testing. They include such types as the German BMW-801, the DB-601, the Bramo Fafnir, the Jumo 211, the Italian Fiat, the Jap Kinsei 44 and many others of more recent manufacture.

GENERAL procedure is for an engine, such as the BMW-801A, to be torn down by power plant engineers. Specialists from American aircraft engine manufacturers then may be called in to examine the fuel injection system, all construction features of the engine—such as provisions for maintenance and repair—and every nut, bolt and gear that goes into the engine.

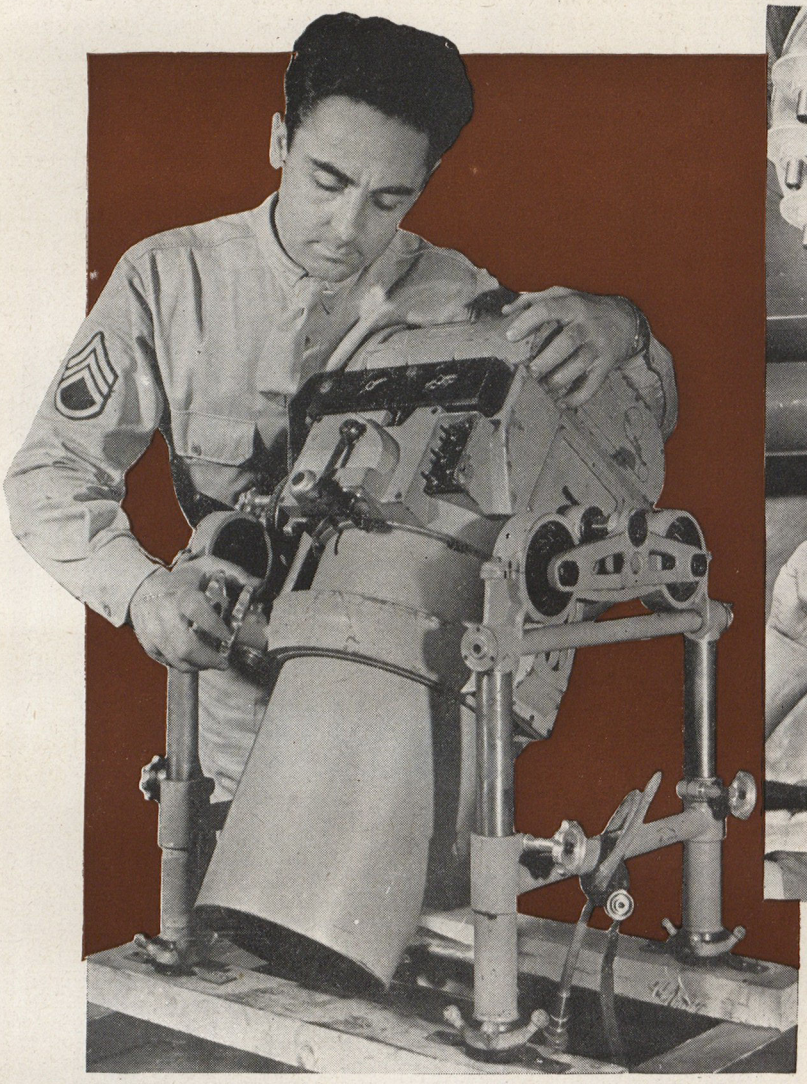
Upon learning whether or not there are any new features in the engine, it is reassembled and put on a dynamometer test stand to determine its power output. From this and subsequent analyses, reports are prepared and distributed to all interested parties to enable them to evaluate progress of our enemies in designing and fabricating warplanes.

These laboratory examinations have proved that American equipment is generally superior to that of the enemy. In those few cases where an Axis-made engine reveals a new idea or a better type of material being used, our engineers are quick to improve AAF equipment.

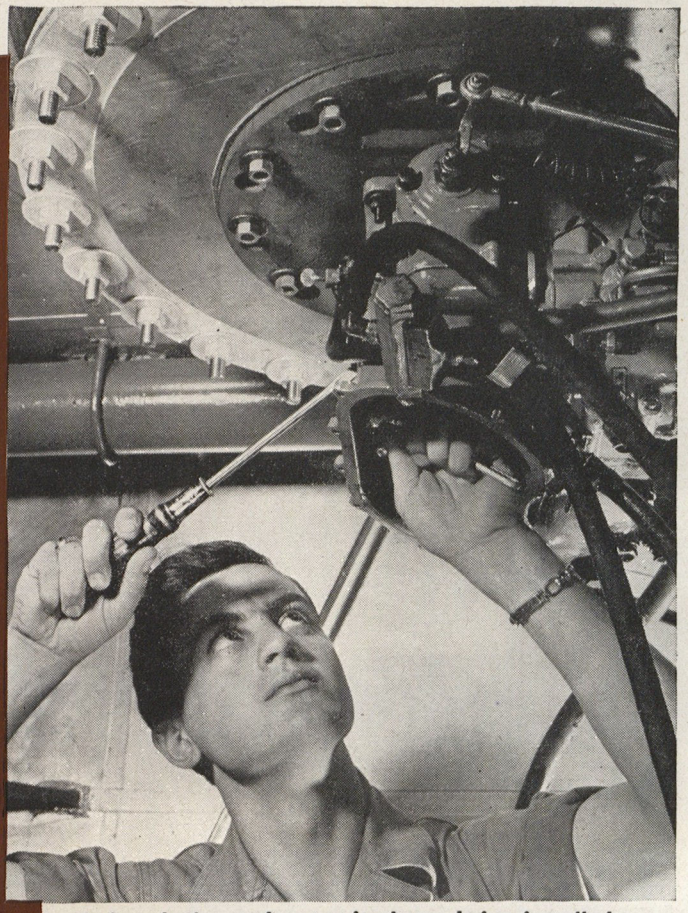
When Wright Field received its first ME-109, six mechanics who knew nothing about German airplanes removed the engine completely in less than twenty minutes. Since that was far less time than is required for removal of American fighter engines, our engineers began to incorporate some of the German ideas in our new power plants. One of the major installations that facilitated rapid removal of the power plant was the concentration of all wiring and fuel connections into a small number of sockets.

From other ingenious methods used by the Germans in mounting their engines, AAF engineers have been able further to simplify engine installations in some U. S. planes, thus facilitating removal of the engine for overhaul and repairs.

The Jumo 207 diesel engine, used in the JU-86P medium bomber, is a tall, slim, in-line engine with opposed pistons that appear to be designed for use at very high altitudes. A bomber with this type of engine has been observed above 43,000 feet over England. *(Continued)*



This aerial camera, similar to the American K-17, was taken from a captured German plane. It is believed to have been manufactured in Czecho-Slovakia. The German lenses are exceptionally fine.



A Jap duplex carburetor is shown being installed in an "air box" at Wright Field for testing under flight conditions at a wide range of temperatures and altitudes. This carburetor, from an engine of about 1,200 hp, was found to be inferior to U. S. types in altitude and load compensation tests.

Another interesting German development is a blower fan on the 1600 hp BMW-801 radial engine. The fan, attached to the propeller hub, forces cool air through carefully designed channels around the cylinders. It revolves approximately two and one-half times as fast as does the propeller to provide efficient cooling on the ground, during climbs when speed is reduced, and at high altitudes. The new principle already has been tried out on an AAF medium bomber.

German engines usually are slightly heavier with an output (per unit displacement) less than that of our engines.

Japanese engines are little more than conglomerate copy of American, British and French engine designs. Pratt and Whitney engines appear to have been the models copied most extensively. Although the Japs have copied our engines, they are getting additional horsepower out of the same engines because they have built them to closer tolerances. However, these engines are copies of types no longer used in our combat aircraft.

The power plant laboratory of the Materiel Command also analyzes fuels and self-sealing fuel tanks.

Of an Italian self-sealing fuel tank, tested in February, the report reveals that two .30 caliber rifle shots caused the tank to leak a stream approximately one-sixteenth of an inch in diameter from both exits. One .50 caliber ball tore a hole approximately 1 inch by 2 inches which remained gaping, showing no sealing characteristics.

FROM some of the more recently shot-down Jap aircraft, sections of rubber and corrugated paper have been found fastened externally to fuel tanks as attempted protection of the most vulnerable parts. These sections are held in place by a wire frame. Tests of the material, however, show that the crude device does not meet American requirements.

German bullet-sealing tanks, on the other hand, are of very high grade materials and first-class workmanship. Tanks obtained from recently captured aircraft are almost identical to those used in American planes.

A test of gasoline from a Jap plane that crash landed in New Guinea showed that it approximated a ninety octane fuel except that the gum and copper dish residue was relatively high.

In the aero-medical laboratory oxygen equipment from the Axis nations has been thoroughly tested with the findings that the German systems are the best of the Axis while American oxygen equipment proves more reliable and more efficient than any Axis-made mask or regulators. The lag in Axis development of good oxygen equipment is believed to be a retarding factor on their bid for high altitude equality with the Allies.

Japanese oxygen masks have been very crude, covering the mouth and nose like a small muzzle without any apparent attempt being made to obtain close fits into the various shapes of pilot faces. The German oxygen units are well made and provide much better fittings.

The constant oxygen supply system still is being used by the Japanese while both American and German systems are of the demand type.

With most other nations, Germany and

Japan are using high pressure oxygen cylinders. AAF systems, however, have been changed over to low pressure to reduce the danger of oxygen explosions when the cylinders are struck by shells or anti-aircraft fragments.

Radio equipment used by the Germans is far superior to that being used by the Japanese and compares favorably with that used by the Allies. Nazi equipment has an extensive range with excellent reception. The Jap radio units are made of poorer grade materials, resulting in lack of range and effectiveness. Many of the Jap ships shot down have not been equipped with any radio.

Photographic equipment of the Germans generally is larger than that being used by the AAF, although, through the extensive use of magnesium, the weight is approximately the same. Preliminary aerial photographic tests have indicated that the German film is slower than that we use.

German lenses, on the other hand, continue to be exceptionally fine. Accessory parts of the Nazi cameras are not of the same quality as those used by the AAF, although they appear to have been manufactured by methods not adaptable to mass production.

The Japanese cameras are carbon copies of the Fairchild K-10, which has not been purchased by the AAF for over ten years.

Clothing for air crews generally is of good materials and good workmanship in all countries. Poorest quality clothing is that used by the Italians. Japanese outfits are of good materials and workmanship but usually are not of the most efficient designs. Nazi flight apparel is of the best.

A Nazi electrically heated suit, as an example, is lined with a plush material and the outer material is of cotton twill. This is the coverall. The wired suit is a two-ply silk trico with sewed-in wires. Fourteen nickle-steel zippers enable the pilot to shed the suit easily.

The Jap-type electrically heated suit is made of a poorer quality material—both leather and lining—and uses a simple wiring system. A detailed diagram on the inside of the Jap pilot's clothing suitcase shows how repairs of the wiring may be made and this idea is being considered for adoption with American outfits.

The Jap electrically heated boots are warm but are very stiff and uncomfortable, being made of a cheap grade of leather.

FROM Wright Field's morgue of enemy equipment have come volumes of interesting reports about the Axis. For instance, Japanese parachutes have been received and examined, disproving the reports that no Jap pilots wear chutes.

The Germans evidently have been well-supplied with magnesium and aluminum throughout the war. On a two-engine JU-86 almost 600 pounds of magnesium was used in this airplane. An unusual parachute dive-bomber brake on the tail of the DO-217 bomber has been studied to ascertain the advantage of this German invention.

The pilot's safety belt in the ME-109 was found to be more comfortable and easy to adjust even after wet through by rain.

German engineers have pioneered in the use of hot air for de-icing the leading edge of the wing. From a JU-88 bomber an entire wing section was thoroughly examined by Wright Field and by the California NACA laboratory. The heat exchanger around the exhaust manifold collects the heat, which is then piped through the leading edge of the wing to a point near the ailerons where it is exhausted.

Since examination of this wing section, hot air de-icing installations have been made on practically every type of combat and cargo airplane of the AAF. Only recently Lockheed reported that hot air de-icing would be used for the wings of its second and third C-69 (Constellation type) planes.

From such examinations of captured enemy equipment by the laboratories of the engineering division of the Materiel Command has come a wealth of information about the enemy's ability to produce aircraft and equipment.

When Wright Field completes its investigation, the equipment is made available to aircraft manufacturers who are interested in enemy design and assembly methods, and to other aeronautical research laboratories in this country.

Every article of captured equipment is put through third degree examinations until the airplanes literally "squeal" to the men who are designing our warplanes. ☆

This German pilot's suit is of two-ply silk trico fabric with interwoven electrical heating wires. Outer garment is a plush-lined cotton twill coverall with electrical connections for the gloves and shoes. It has fourteen zippers and they are of nickel-steel.

VARIETY is the spice of life. Accordingly, this month we coaxed our camera away from the nose of a plane and snapped this rear view of a P-47.

Mishandled repairs can occur on any part of an airplane as shown by these empennage fixers. There are six boners in this photo, listed on Page 56. Are there any we missed?

Topnotch mechs always bear in mind that the airplane not only must fly, but also that it must fly *reliably*. To achieve this is a solemn responsibility ON THE LINE.

To show how it shouldn't be done this picture was posed by members of the Air Service Command's 315th Depot Repair Squadron, Patterson Field. They are Pfc. William Ramsey (left), Pfc. George Kirkendall and Pfc. Edward W. Kerscher (top).

ON THE LINE

A monthly maintenance roundup prepared in collaboration with the Air Service Command and the Technical Inspection Division, Office of the Air Inspector.

Hints on Hand Tools . . .

Recall the old wheeze about throwing a monkey wrench into the works? That's just about the equivalent of using a Stilson wrench on surfaces that require an open end wrench. Stilson wrenches were designed primarily for the general purposes of plumbers—not aircraft mechanics—so take the time to get the right wrench out of the tool box and if it isn't there go to the stock room for it.

Which gets us around to the matter of using hand tools. Improper usage results in damage to parts as well as to the tools, and makes for slim chances of proper repair.

Choosing too large a lever to tighten ignition plugs can break them; use the torque wrench to get the right tightness. Tightening or loosening with too large a wrench will round the corners of a nut, making it difficult to remove the nut at all. This then means cutting it or forcing it off with a special device, necessitating replacement with a new nut. In similar maltreatment of a screw, using the incorrect screw driver will probably throw a burr on the edge of the slot.

There is one positive precaution to avert these needless troubles. And that is *read the TO*. For every airplane, for every service procedure, a TO has been carefully written. It tells what tool to use and where to use it.

Lowdown on Winterization . . .

Since a winterized airplane can operate anywhere, nomenclature can be misleading. Winterization is a term referring to the preparation of a plane or its equipment so that operation will be satisfactory within a temperature range of from 65 degrees below zero to plus 160 degrees Fahrenheit. Extreme temperatures naturally affect the operation of oil system, fuel system, power plant, controls and other important parts of the airplane, and it is necessary to guard against improper functioning. During the winter extremes of temperature present severe problems which make servicing more complicated than in summer months.

The first essential is to see that all parts are lubricated with oils and greases which are satisfactory at all temperatures encountered, and in accordance with current practices, winterized airplanes should operate satisfactorily in *any* theatre. That is, present winterization processes make planes adaptable to any climate. However, certain exceptions require special equipment for extremely low temperatures, such as providing special snow and ice tires, form-fitting covers to keep ice off wings, de-icer boots for wings and tail surfaces and internal combustion type heaters to provide heat in passenger compartments of transport airplanes.

It is imperative that mechanics servicing airplanes destined for extremely low temperatures become thoroughly acquainted with the general requirements of TO 00-60-3. It describes in detail methods of cold weather ground warm-up, cold weather starting and stopping of airplane engines, and explains the problems facing mechanics servicing planes in the arctic.

Saved from the Boneyard . . .

As a result of the ingenuity and industry of its crew chief, Staff Sgt. Anthony

P. D'Andrea, an observation airplane forced down near an Antilles Air Command base and marked for the boneyard has been restored to flying status.

Crew Chief D'Andrea first trekked six days through swamps and dense foliage to reach the crash scene at a mud flat near Paramaribo, Surinam. With the aid of native labor, a short runway of chicken wire and scrap lumber was improvised and the plane jacked laboriously out of the mud. From this makeshift runway veteran jungle flyer Capt. Charles Ross volunteered to fly the plane out. He got it away and landed at a nearby airbase.

Back at its home base the craft was grounded for a complete overhaul, and the only usable parts were the wings, instruments and metal struts of the fuselage. Sergeant D'Andrea then began his tedious task of rebuilding it. Using materials available at his South American jungle base, he completed a major depot overhaul job, virtually taking the plane apart and putting it together again with new parts.

A plane once given up for lost is now back in service, being used for reconnaissance flights, rescue work, aerial photography, short shuttle service and similar missions.

Hats off to another job well done by mechs of the Army Air Forces.

Don't Swing That Thing . . .

Hoisting at an angle or not centering the crane above the object to be lifted tends to cause swinging of the piece being raised. This may result in damage to valuable equipment or injury to personnel, or both. First adjust your crane so that it is centered exactly before starting the hoist. Take a look at AC Circular 130-2.

Spreader Bar . . .

When an engine is left on a type A-2 frame, be sure to install a spreader bar. Failure to do so will result in bending the A frame at the fulcrum point and endangering personnel in the event of a collapse.

It Won't Hold You . . .

Cowling support frames are designed to keep the cowling in place and are not stressed to hold the weight of a mechanic. Keep this in mind the next time you're working on an engine, mechs.

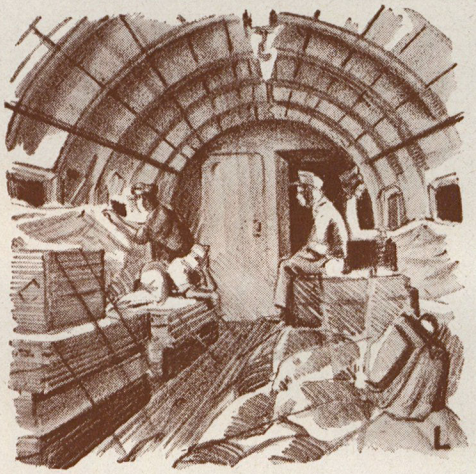
Jack Safety Nut . . .

Safety nuts are to be screwed down on airplane jacks when in use. See TO 19-1-18. ☆

THE BANANA RUN

By Sgt. James Winchester

AIR TRANSPORT COMMAND



WE walk from the Brownsville operations office through the warm Texas night to a cargo-laden C-47.

Out of the shadows troop an assorted group of officers, enlisted men and civilians ready for the Brownsville-to-Panama hop. The pilots sometimes call it the "Banana Run."

Blue-striped foreign military cargo is stowed high along one side of the luxury-stripped cabin. Mail bags, carrying thousands of letters and packages to our men in the Caribbean area, fill the rest of the space, leaving only a narrow aisle, barely wide enough for the crew to squeeze through with their map cases, down the center.

The job ahead is just another day's work for pilots like Capt. Bill Betts. But looking at their job as a whole, it is an important cog, not only in supplying of cargo and mail to our vital Caribbean defense outposts but also in the training of newly graduated aviation cadets who, in a few brief weeks of concentrated training, are transformed into capable and efficient Air Transport Command pilots.

Coming down the aisle of the plane behind us, as we inch along between the cargo, is one of these transition students who is making his first run over the route as an observer. Later he will fly its 2,000-mile length on two round trips as co-pilot before leaving the transition school and going into an operational training unit for final polishing.

This one is Lieut. Richard Wagner, who is fairly typical of most of the boys coming into the command for their transport pilot training—young, aggressive and eager to do his part in what he thinks is the best possible way, flying the freight. Some guys like the fighters and some like the bombers, but for these boys there is something in the thought of a big cargo plane winging its way through the night across a black ocean that makes their pulse beat a little faster.

This Lieutenant Wagner, for instance. He had wanted to fly for a long time and had indicated he would like to be a transport pilot, so his future training was planned to lead him up to that goal. He went through the regular curricula of the aviation cadet program before he received his wings, but he'd never been in the cockpit of a twin-engine airplane until he arrived at Brownsville from the ATC's reception center. At Brownsville his training in the intricacies and problems of air transport flying really began.

For the first three weeks, he had large doses of work thrown at him from every angle. He spent hour after hour making landings and take-offs in a twin-engine C-47. Under the able guidance of a contract carrier pilot instructor he learned to know the instrument panel of the C-47 until he could shut his eyes and name the position of every dial on the board, how it worked and what it was used for. He learned that there is a lot of difference in flying a twin-engine transport and a single-engine trainer, and most important of all he learned that he hadn't yet started to learn all there was to flying.

ILLUSTRATED BY LIEUT. WILLIAM T. LENT

In case Lieutenant Wagner or any of his fellow student pilots should ever be confronted with engine trouble aloft, a large portion of their transition training in Brownsville was devoted to practice and procedures in how to take care of such situations. Day after day they were taken up to practice flying with one engine cut out. They learned to feather the prop, trim the plane and do a score of other things necessary in operating on one engine. They learned the sounds of engines so well that they could recognize trouble almost before it happened.

They learned the importance of checking every single piece of safety equipment aboard a plane before takeoff. And the student pilots really appreciate this lesson when they look down from the safety of 10,000 feet into the mountains and jungles they fly over during the latter phase of their training and think

ATC student pilots get their first taste of real transport flying on this Brownsville-to-Panama hop.

of the many things that might happen.

The trip south for Lieutenant Wagner is the beginning of the end of his training. Like most of these transition student pilots, he has never been out of the United States, and there will be plenty for him to see and observe on this trip south of the border—things that can't rightfully be called "training aids" under the strict interpretation of the military but that, nevertheless, are equally important in molding the new pilots.

Before leaving Brownsville, Lieutenant Wagner has been instructed in the rules of behavior for military personnel in the Central American area. Four rules stand out:

1. Don't exhibit firearms in public.

2. Don't whistle at girls in the street. 3. Obey all local civilian laws and ordinances. 4. Be properly uniformed at all times.

So several hours and some thousand miles later, when the wheels of his plane roll to a stop at the end of a runway hacked from the middle of a dense coastal jungle, he's ready to forget those months of tedious training back in the States—at least for 24 hours, until he picks up his bag and map case the next day to take the second leg of the flight on to Panama. They will stay overnight at a jungle field and fly back on the following day to this same airport, where they will lay over for another 24 hours before returning to Brownsville.

In all, four days are required for each crew to make the round trip from Brownsville to Panama, and it is the policy of allowing these 24-hour breaks in flying time that is largely credited with the enviable operation record that has been established over this route. Since its inception every scheduled flight has been completed and not a life or plane has been lost.

The "coke" bar, located in the operations office at this jungle airport, is one of the Army's smallest, yet busiest PXs. Its counter is less than seven feet long and its principal stock in trade is a huge refrigerator, but this PX does a monthly business of better than $900 which comes mainly from these ATC pilots and the passengers on their planes, both north and southbound. Lieutenant Wagner is joined at the bar by three of his Brownsville buddies, also there for their 24-hour layover.

Like youths everywhere, in or out of uniform, get more than two of them together and they will go looking for a pretty ankle. Pretty ankles being scarce at this jungle airport, it is no effort at all to make the decision to ride an Army truck up a mountain trail to spend the night in a cool cosmopolitan Central American city.

Truck travel in the jungle not being designed for passenger comfort (one pilot is reported to have made the rest of his observation flight standing up after completing this junket to the high country), a sergeant undertakes to relieve the monotony of the journey. His approach is direct and to the point. Three minutes from the field he begins to riffle a worn pack of cards with practiced fingers. Too rough to play cards on any flat surface, if there had been any flat surface, he proceeds to initiate the new lieutenants into the mysteries of a game known as "Esquintla Showdown" and taught him by a couple of native soldiers in a town by that name. It's a simple matter. You deal seven cards to each player, who holds them tightly in his hands so they won't be shaken loose when you hit a bump, which is on the average of three bumps to each complete revolution of the wheels. Aces, deuces, one-eyed jacks and the card that had a corner torn off in some previous GI struggle are wild. Best five cards out of the mess collects a quarter each from each of the other players. You'd be surprised how it makes the time—and money—pass.

In the town, high in the mountains, even in the middle of summer two blanket at night are welcome. Here leather goods can be purchased for a fraction of their cost in the States and it's a rare pilot indeed on this run who doesn't have a pair of Guatemalan boots, a Guatemalan leather map case and a native belt. Here, too, pretty ankles are more common than in the jungle. But Lieutenant Wagner's best remembrance of the city is the sign over the slot machines in the local officer's club:

"In case of an air raid stand here; these machines have never been hit yet."

By ten o'clock the next morning, Lieutenant Wagner and the others are off from the jungle airport for the six-hour run down the long neck of Latin America to the Canal Zone. With one stop for refueling, this leg of the trip passes over some of the most beautiful country in the Americas—towering mountains, volcanic lakes and miles of sandy shore line.

As the transport approaches Panama, interceptors come up out of jungle airports to inspect the ship and from then on until the end of the trip crew and passengers alike are given a first-hand show of the care with which Uncle Sam guards his approaches to the Panama Canal.

The trip home is just a repetition of the run south, except that passengers are hauled instead of freight and mail—officers and soldiers returning home on furloughs, passes, transfers, most of them for the first time in two or three years. In fact one wag in the waiting room at the airport in Panama has penciled an arrow pointing to the loading door and underneath it written, "This way home!"

Back in Brownsville, Wagner sums up his impressions of this first run of many he will make all over the world in ATC planes.

"It's a wonderful experience," he comments, "not only because of the country and various types of weather you are able to observe and fly over, but also for the sobering and steadying influence you get from the thought that here a mistake doesn't just mean another hour of classroom study, more likely it will mean a couple of weeks hacking your way out of some jungle, fighting mosquitoes and snakes and tropical fevers. If I learn nothing else here that lesson itself will be forever valuable to me—an ounce of prevention on the ground is worth a pound of cure in the air."

In a few months he'll probably be as blasé about flying from Miami to India as he is about shaving himself in the morning but right now he is a pretty excited guy. ☆

WHEN GREETING AN ESKIMO SAY, "Eye-yigh!"

THE Eskimo may seem enigmatic to us. For all his stolid appearance, he is keen about sports and merriment. He can be friendly and loyal, but he can also let a man freeze to death or starve if he doesn't like him. Friendliness and firmness are the two qualities you'll need to deal successfully with the Eskimo. Above all, even the smallest knowledge of the Eskimo language will work wonders in winning his friendship.

With the first word you speak, an Eskimo will size you up as an outsider. He won't expect you to understand a flow of language and will probably talk to you in single words and short phrases. But he will be complimented and inclined to friendliness if he hears you trying to speak his langauge. He may even grin broadly and shake hands enthusiastically. Be friendly in return.

The Eskimo language is difficult to learn. A white man can't hope to speak it well without living for years in the Arctic. It is, for the most part, a *spoken* language. The Eskimos have found it possible to carry on their lives, to hunt and fish and travel successfully, without writing their language. They have devised no alphabet of their own. The words and phrases which appear in this "lesson" and the word-list that follows are used throughout most of the Arctic — from Greenland and Labrador westward through northern Alaska. The language spoken in Alaska south of the Yukon, and in the Aleutian Islands, is quite different, however. It resembles more nearly the language of the British Columbian Indian tribes.

The Eskimo words and phrases in this "lesson" are spelled out in a simplified system which represents the language as it sounds in English. The system contains letters for all the sounds you must make to be understood. The English spelling used here comes as close as possible to the proper sounds to help you pronounce the words easily and correctly. For example, take the Eskimo word for walrus. This word has been spelled *iviuk* and *aiviuk* by explorers, but no one can tell from these spellings what the Eskimos call the animal. Actually they call it the *ivy-uck*—the plain English word *ivy*, plus the syllable *uck*, which rhymes with *luck*. Even if you should pronounce the word to rhyme with *nook* or *spook*, it would still be understandable.

When you meet an Eskimo, you probably will say, "Hello," and the flat-faced, fur-clad man may even say something like "*Har-low*" in return. If he doesn't understand your word, he'll understand your facial expression and extended hand, at any rate.

The greeting auk-shun-EYE is in use in Labrador, and on Baffin Island. It means something like "how do you do?" In Hudson Bay, the most common phrase of greeting is CHIME-oh, meaning about the same thing. But there are parts of the north country where no greeting beyond an explosive eye-YIGH is used.

The ideas you will want to put across to an Eskimo will have to do mainly with such essentials as food, water, shelter and the like. The chances are you'll be hungry wherever you are, whatever the season, so you must know the phrase kah-POONG-ah, which means "I am hungry." Don't pronounce the *g* strongly. Pronounce it about as you do in ping-pong. Kah-POONG-ah is composed of parts of the words, KAH-pok (hungry) and oo-VUNG-ah (I).

The pronoun oo-VUNG-ah (don't pronounce the *g* strongly) can be combined with various adjectives to express how you feel. The resulting phrases are not grammatical, but they are readily understandable and are much more pro-

PREPARED BY THE ARCTIC, DESERT AND TROPIC INFORMATION CENTER

nounceable than the strictly correct ones:

Oo-VUNG-ah ICK-key—I am cold.
Oo-VUNG-ah quawk—I am so cold I am freezing.
Oo-VUNG-ah COW-shook—I am wet.

The pronoun meaning "you" is IG-vee. So IG-vee ICK-key would mean you are cold or are you cold, according to the inflection of your voice. Now for a few phrases using the pronoun IG-vee:

IG-vee pee-oo-YOOK—You are good.
IG-vee COW-shook?—Are you wet?
IG-vee oo-AIR-nook?—Are you sleepy?

If you need something, you will use the phrase pee-you-mah-VUNG-ah, meaning I need or I want, together with some noun, which is the name of the thing you need. Again these phrases are not strictly correct Eskimo, but they will serve to put your ideas across:

TEE-mik pee-you-mah-VUNG-ah — I want some tea.
EE-mick pee-you-mah-VUNG-ah—I want a drink of water.
NER-key pee-you-mah-VUNG-ah — I need food.

KING-mit pee-you-mah-VUNG-ah—I want dogs.
COMMA-tick pee-you-mah-VUNG-ah — I need a dog-sledge.

If the Eskimo brings you what you want, you will want to thank him. Your new-found friend will appreciate the courtesy, for he himself is polite, no mater how uncivilized he may appear to be. So here's a phrase of thanks:

Koo-yah-nah-MICK—Thank you.

The things you will be likely to need will have to do with clothing, equipment and food. Here are some names you should know:

COM-ic—boot
KOOL-ee-tock—blouse or parka
AH-no-wah-ga—clothing
IG-loo—snowhouse
PAH-na—snow-knife
KOO-di-lick—seal-oil lamp
COMMA-tick—dog sled
EE-ko-mack—matches or fire
COOKY-oo—gun
TOO-peck—tent
NER-key—food
OO-me-ack—boat

Both oo-VUNG-ah (I) and IG-vee (you) can be combined with verbs to express simple ideas. Accurate Eskimo verb forms are exceedingly complex so about all you can hope to use is the verb-stem combined with pronouns. Here are samples:

Oo-VUNG-ah OWD-lah—I am going (the OWD rhymes with crowd).
Oo-VUNG-ah tah-KOO—I see it.
IG-vee KAH-pock?—Are you hungry?
SHOO-nah IG-vee NERRI-wah? — What are you eating?

If you want to stress the idea *your,* you may add the simple word IG-vee to the noun. Again the resultant phrase is not strictly correct, but the Eskimo will understand you:

IG-vee IG-loo—your house

IG-vee KING-mick—your dog
IG-vee PAH-nah—your snow-knife

Suppose you want to ask where something is—a lake, river, or house. The important word *nowk* means *where.* Pronounce the *ow* as in *now.*

IG-loo nowk?—Where is the house?
IG-loo IG-vee nowk? — Where is your house?
COKE nowk?—Where is the river?
Kab-LOON-ah IG-loo nowk? — Where is the white man's house (or trading post)?
COOKY-oo nowk?—Where is the gun?

The idea of bigness is expressed by the addition of *ju-ak* to familiar words. Listen closely for such lengthened words. Thus:

Ee-MACK-ju-ak—big water, ocean
Oo-mi-AK-ju-ak—big boat, ship
Ig-LOO-ju-ak—big house, trading post

The idea of smallness is expressed by adding *at-suk* or *ah-pick* to words. Thus:

KING-mick-AT-suk—little dog, puppy
IG-loo-AH-pick—little house, kennel

You should know a few human interest words and phrases for use when you meet the family:

AHNG-ot—man
AHNG-e-nook—woman
NOO-tah-rock—baby
AHNG-o-ti MAR-ick—real man, he-man
AHNG-e-nook mick-i-OO—little woman
NOO-tah-rock pee-oo-YOOK—good baby

Knowing the names for a few parts of the body will help. Most of these are easy to remember because they're short:

KING-ahk—nose
Nee-AH-coke—head
Key-OO-tit—teeth
AHG-sah-eet—hands (literally, the fingers)
IT-i-gut—feet

You will want to say *yes* and *no,* of course. There are various degrees of these ideas:

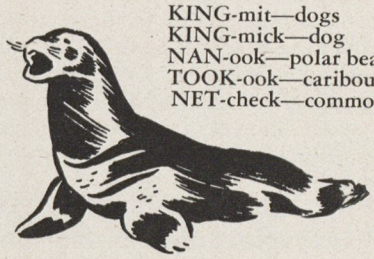
Ah-high-LA or AH-me-la—yes
Ak-shoo-AH-look—yes, indeed!
AH-guy—no
NAH-gah—no, indeed!

The weather is a good topic of conversation the world over. It is of real importance in the Arctic:

SEE-lah—weather
SEE-lah pee-oo-YOOK—good weather
AH-no-way—wind
AH-no-way pee-YUNG-i-took—bad wind
AH-no-way AH-mish-oot—much wind
AH-no-way AH-mish-oot oo-BLOO-me — much wind today
AH-no-way AH-mish-oot AH-kah-go — much wind tomorrow
ICK-key—cold
ICK-key AH-kah-go EE-mah-kah—cold tomorrow perhaps
CONN-neck AH-kah-go—snow tomorrow

You should know the names of certain Arctic animals, too. The Eskimos use these nouns often:

KING-mit—dogs
KING-mick—dog
NAN-ook—polar bear
TOOK-ook—caribou
NET-check—common seal



OOG-zhook—hair seal
Kelly-LOO-gak—white whale
EO-kah-look—salmon trout
MIT-tuck—eider duck
Ah-HIG-i-vik—ptarmigan
OOK-pick—snowy owl
NERD-look—Canada goose

You'll need a few everyday expressions for use in travelling, working, hunting and the like:

TOOK-oo-roo!—Look at that!
TIE-mah — It's done. The job's finished. Let's quit.
AH-tay!—Go ahead now. Get going!
Watch-AIR-oh.—Wait a bit.
Mah-nah—Now
OWK! or HOWK! — To the right (dog driver's term)
OWK-ah! or HUH-dah!—To the left (dog driver's term)
KI-geet!—Come here! (pronounce the *i* as in *mice*)
KI-sah-geet!—Bring it here!
SEE-ko—Ice
CONN-eck — Snow (especially when it's falling)
SHEE-nah — Ice floe (open water at the edge of the ocean ice)

Before you leave your friends, you may wish to say more than koo-yanna-MICK, "thank you." Perhaps you'll say:

IG-vee pee-oo-YOOK—You are good.
IG-vee-lo AHNG-e-nu-lo pee-oo-YOOK—You and your wife are good.

(Note that the syllable *lo* is added to both words when the two are joined with *and.* Thus the expression for snow and ice would be SEEK-ko-lo CONN-neck-lo.)

IG-vee NER-key pee-oo-YOOK — Your food is good.
Tug-VAH-oo-tit!—Good-bye! ☆

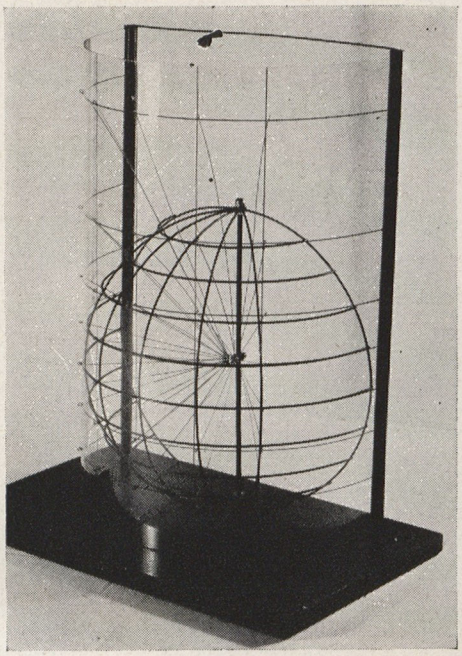
SYNTHETIC DEVICES

MAP PROJECTION MODELS. In navigation training with wall charts as the only aid, students experience difficulty in grasping the third dimension factor.

Three-dimensional map projection models have been developed to overcome this training handicap. The spherical earth is simulated in a plastic hemisphere with red meridians of longitude and blue parallels of latitude. The surfaces on which points on the world sphere are projected are sheets of transparent plastic. Lines running from the center of the world sphere to the points at which meridians and parallels meet extend to the plastic sheet to represent projection lines.

The student thus may be shown clearly the method used to locate on a chart or map points corresponding to those on the surface of the earth.

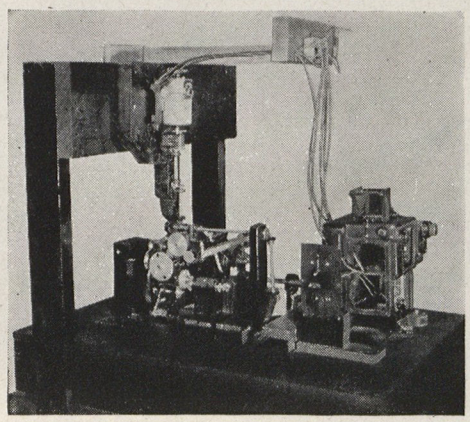
The set of four models is designed to demonstrate the fundamental principles of Mercator, Gnomonic, Conic and Lambert-Conformal projections.



Mercator Projection

'EXPANDED' COMPUTING SIGHT. The extremely compact construction of the Sperry Automatic Computing Sight is an asset in the close confines of aircraft turrets, but to trace the internal movements of the sight's several gear trains through the closely knit maze of shafts and gears is difficult for new students of sight maintenance.

Accordingly, a standard Sperry K-3 Sight was "cross-sectionalized" by the armament school work shop at Lowry Field, Colo., to make the working model shown in the photograph. The mechanism was "expanded" to provide the student an easy way to follow the movements of the various shafts and gears.



The computer assembly has been removed from the optic mechanism and further separated into sub-assemblies.

The shafts and gears related to each gear train have been painted a distinctive color, so that their motion can easily be followed throughout any operating movement of the sight.

The sight's own 27.5-volt DC motor is utilized to provide the driving power, affording the student both correct operating speed and a wiring harness to trace for proper maintenance.

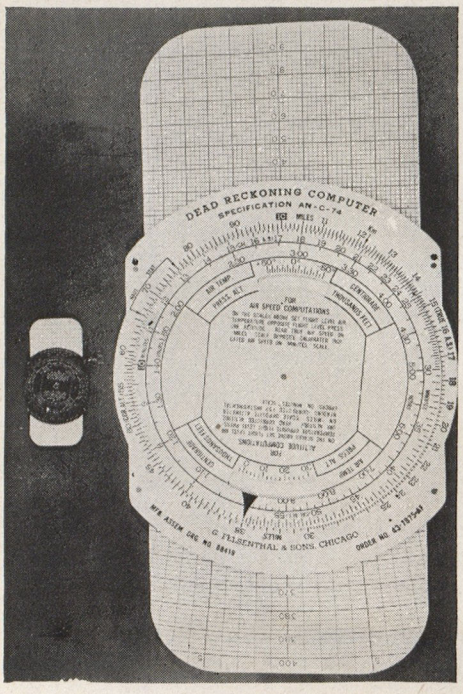
Certain groupings of gears and cams normally hidden from view have been revealed by cutting away portions of the outer case of the sight.

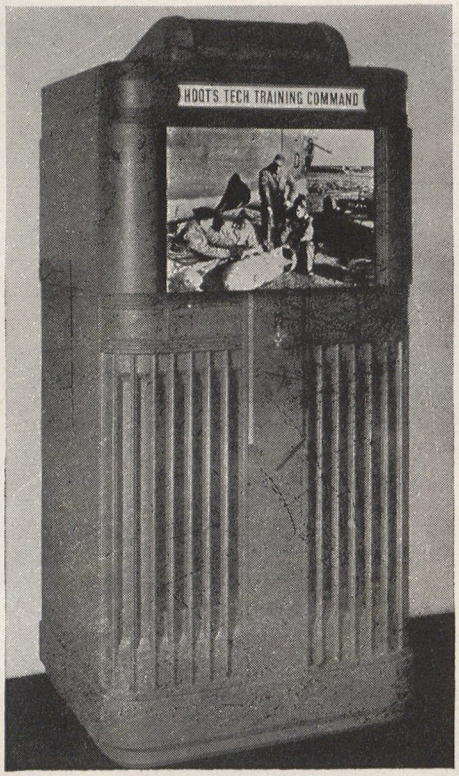
Since the unit was intended primarily for teaching maintenance of the sight, not operation, it is not connected to a turret. However, with a few modifications, it could be adapted for this purpose. It occupies a table top approximately 30 by 40 inches. ☆

DEAD RECKONING COMPUTER MOCKUP. The giant mockup is being adopted as an effective aid in teaching large groups of students the use of various instruments.

The photograph shows a giant mockup of the dead reckoning computer. The regular size is shown alongside.

Similar blowups have been developed on the aircraft navigation plotter, the air speed correction computer and the altitude correction computer.





JUKE BOX GOES TO WAR. Remember the juke box you used to put a dime into for a three-minute short? You'll be seeing it again, but in GI paint and minus the dime slot. It's being used in AAF training establishments to show educational films. The projector operates with ordinary 16 mm film wound on an endless reel.

WHERE TO GO

Information on the availability of training films and film strips, aircraft recognition materials, synthetic training devices and training literature may be obtained from the Training Aids Division, Army Air Forces, Park Avenue and 32nd Street, New York, N. Y.

'COURAGE IS NOT ENOUGH'

By First Lieut. Peter J. Packer

FLIGHT CONTROL COMMAND

The following fiction story was written by Lieutenant Packer as the basis of a scenario for a safety education film to be produced by the AAF First Motion Picture Unit in collaboration with the Flight Control Command.—THE EDITOR.

TOMMY and I went through flight school together—pre-flight, primary, basic and advanced. We got along swell. Both of us were a long way from home, kind of homesick at first. But when a couple of fellows get to know each other real well, it makes things a hell of a lot easier.

I always thought Tommy was right up there with me when it came to getting passing grades until the time he flunked a fairly simple instrument quiz. Tommy just laughed it off, and I didn't pay much attention to it. I knew he had just received a letter from Joan, telling him that she'd marry him as soon as he graduated, so maybe that was the reason. Anyway, it wasn't important enough to be concerned about at the time.

In the air Tommy was a swell pilot. He took to the air like a duck takes to water, and his instructor had very little trouble with him. After six hours of flying time, Tommy could do more with his ship than most fellows can do after twenty. He was always raring to go when flight periods came around.

I admit quite freely that Tommy was a better pilot than I at that stage of the game, and from one standpoint he was a better pilot right up to the last. He was a natural when it came to aerobatics, and most of us in flying school were betting that Tommy was going to be the best fighter pilot in our class.

Well, you know there's a lot to flying you have to learn on the ground before you can take to the air. Some of it is dull, plodding material that just can't be made glamorous except to a congenital glamour boy.

Let me give you an example. It comes out of a tech manual:

"Scale error is defined as the algebraic difference of the standard pressure altitude and the indicated altitude when the altimeter is subjected to the pressure corresponding to the standard altitude (altitude chamber text)."

See what I mean?

Most of you know how to get the meat out of that piece. Anyway, I hope you do. Maybe you don't know it the way it's written in the book, but I'll bet when you are looking at your altimeters you know exactly what corrections to make for scale error.

If you cottoned to it the way I did, you tried to grasp as much as you could from the book, and when it got too much for you, you got your instructor to tell you about it in plain American—with gestures.

At any rate, I knew it was something

Tommy could have been a world-beater as a pilot but he elected to throw the book out the window.

I had to know. It didn't matter how I got it, so long as I knew it when I needed my altimeter.

Tommy slept through that lesson.

I remember that night in study hall when I said something to him about "pressure altitude variation," and he looked at me as if I were talking to him in Arabic.

Did Tommy pass his tests? Sure, he passed enough of them to get through. When a subject had him floored, he'd cram like hell just before the test and come to the classroom with a bellyful of half-digested facts which he'd shoot at the test paper like machine gun bullets. Ten minutes after the test, his mind would be a beautiful blank on the whole subject.

When I talked to him about it, he'd give me that world-beater smile of his, and tell me to quit worrying about him. All he was waiting for was the day when he'd be at the controls of a P-51 with his finger on the gun button, and a couple of Messerschmitts riding on the sights.

You know, when I think it over, it seems to me they just couldn't have washed Tommy out, even if he'd flunked every written examination in the school. He was too damned good in the air.

The way Tommy dove at a target and hit the bull was a cure for all the headaches in Washington. Tommy was a natural fighter. They just couldn't wash him out.

No matter how well you know a guy, no matter how much you're on his side, you just can't keep after him when it comes to studying. Either he gets all worked up about it and tells you to mind your own business, or else like Tommy, he says:

"Sure, I'm coasting through. I've got no time to waste on AT-6s, or that stuff you get in the classroom. A ship is like a car, see! You don't have to learn anything out of a book. You get behind the wheel and away you go. So instead of gear shifts, you've got elevators. Instead of brakes, you've got flaps. Instead of a steering column, you've got ailerons. Simple!"

So—we graduated.

As I said, Tommy always knew just enough at the right moment to get by. And the way thousands of us are going through the schools these days, there is never any one instructor who has time to concentrate on any one cadet.

There never is time, in wartime.

Tommy passed his tests, and that was the gauge the instructors had to his ability. The rest was up to him, as it was up to the rest of us.

The Air Corps used to be an outfit where every man was hand-picked, where every move he made was watched and studied and analyzed. He didn't have to be good. He had to be perfect.

But that was in peacetime, and many of the pilots who came out of the Air Corps in those days went to work for the commercial airways. I don't have to show you a graph of their record for you to know how good they were. American airline pilots are the best in the world.

So the Air Corps has to depend on the men themselves. It gives them everything it can in aircraft, equipment and knowledge. It gives them every last minute of time it can possibly spare to turn a pre-flight cadet into an airman with wings. And after that it gives them something that is like a letter of credit, a warrant of its belief in them. This letter of credit which each of us gets, is a sort of a green light to our Commanding General, which tells him that his Air Force is stronger by one more pilot, one more navigator or one more bombardier.

Don't look for that letter of credit in your 201 File. It isn't in writing. You

won't be able to walk into Wanamakers and order a camel-hair coat on the strength of it. But your squadron commander may be able to put out a field order that'll knock some Japs off the map on the strength of it.

All this isn't exactly about Tommy—but I guess it does have a bearing on the case.

Two days after we graduated Tommy and Joan were married. I was best man. They were married in a little place in Ohio where Joan's folks live.

A week later he and I were flying P-51s out of Patterson Field.

It was the same Tommy who had gone through cadet training—a whizz in the air and a stinker when it came to learning stuff that wasn't directly concerned with putting a cannon shell into the belly of a Dornier.

I remember one time we were flying formation. They made me the element leader and Tommy was my right wing man. We went up to 8,000 through the overcast and that was the last I saw of Tommy until I came down. He came in smiling about half an hour after I landed, with not enough fuel left for his cigarette lighter.

"What happened?" I asked.

"I stayed on the heading like you said," he told me.

"What heading?"

"One twenty."

"It was one forty, Tommy," I said. "For Pete's sake get hep to that navigation if you want to stay in the game."

Tommy smiled—world beater again.

"There I was," he said. "Just like I figured it would be in actual combat. And below me, maybe at 5,000 is a Heine bomber. He noses out through a break in the clouds, then he's hidden again, and I'm pretty sure he hasn't seen me. So what do I do. I make a 180 turn, climb a piece just to give myself lots of room. Then I make another 180 turn, and I dive, and believe it or not I am on his tail before you can say Schickelgruber. I let him have it. Bingo, the tail gunner is out. I let him have it again. Off comes the top turret. Then just before I climb out of his road, a lucky one gets him in the bomb bay, and it's all over."

"Did you actually do all that maneuvering Tommy?"

"Only in my head," he told me.

"And ended up 20 degrees off course. Nice going. You could have hit a mountain or something."

"Ain't nothing but hills in these parts," he grinned.

"How'd you get back?"

"Why, Steve, I know this country like the back of my hand. I let down to where I could see it."

What can you say to a guy like that?

Three months later we were in England. We flew with the Mosquitoes at first to get to know the country. Then they put us on missions of our own. We strafed railroads, airdromes, ammunition dumps—any damned thing we could find.

Tommy was a wizard. Enemy camouflage never fooled him. He could see stuff from the air like a chicken hawk.

One time when I thought he was lost—again—I had a wire from Brighton:

"HAVING WONDERFUL TIME. WISH YOU WERE HERE."

How he ever got to Brighton, which is on the south coast when our base is a hundred miles north of London, beats me.

"Had a little trouble with that Channel fog," he told me when I finally caught up with him. "Don't they ever have clear weather in this country?"

WHEN you're in combat you don't ride a guy the way you might back home. You have to use indirect methods to tell a man what you want him to know, like when I wanted Tommy to try and pick up a little more theory on instrument flying.

I took him along as my co-pilot on a night flight in a two-engine ship. I pretended to get lost and left it up to him to try and get us back. If I'd left it to him long enough, I think we'd have wound up in Iceland. Anyway, when he started figuring our position and making calculations, I almost wept. He was terrible.

I hoped the lesson would stick in his mind. Instead, he told me what a great flying partner I was, and he would never have to worry about getting in a jam so long as I was around.

"But supposing I'm not around," I said.

"Nothing's gonna happen to me, with Joan over there waiting for me to get back," he said. "Not a chance."

I don't pay much attention to luck, but Tommy had it if anyone did. He always got back—somehow. He was strictly a lone wolf when he did get back. He'd stay with the formation until we got to the target, but if we got in a fight he'd stay right in there until the fight was over, then lose himself. You could almost always bet your last dime that Tommy would never be at the assembly point when the others were. He either got home way ahead of us, or way afterwards.

So I began to believe in luck—until it happened. Then I knew it wasn't luck, but some complicated part of the law of averages which allows a guy to stay out of trouble for so long and then hits him when he least expects it.

It was a little place in Holland this time. I can't remember the name of it. Maybe I don't want to remember it because it'll always be tied up in my mind with Tommy Newton, with the law of averages, with the damned fool stubbornness of a guy who might be here today getting a medal pinned on his chest, and with a wife crying her heart out and having nothing to look forward to but the memory of the guy she loved.

You can't blame what happened on the weather, because we all came back. All except Tommy. He stayed in the North Sea. It wasn't good flying weather, but it was good enough to take a crack at the target and get back. It was a new flying field we'd heard about, and it was supposed to be crowded with those 16-year-old Nazi pilots. We wanted to throw a good scare into them before they knew what it was all about.

There was a fog, turbulence, ice—the works. And that's another thing Tommy never quite caught up with, weather. He could have learned about it and mastered it as well as the next guy, but he just didn't think it mattered too much. Weather wasn't a cannon in the spinner; weather wasn't .50 calibers in the wings. And because cumulo-nimbus didn't pack a wallop for the enemy, it wasn't important.

I knew what kind of flying we were headed for, so I took Tommy aside and made him promise he'd stay right beside me out and back. Tommy laughed and promised, and I like to feel that he kept his promise until it was just beyond his power to do so.

We got to the target, and we shot that place up from end to end. Altogether, we got nine Messerschmitts on the ground that trip, and headed for home—and believe it or not Tommy was right beside me. We came out over the North Sea about twenty miles north of The Hague. That was our assembly point and that was where we started to run into the storm area.

I got the signal from the leader for a 45-degree turn left with letdown to 2,000, and it was when I made that turn that I lost Tommy. I don't know exactly what happened, but I can guess that he balled up on the letdown, went off course and started flying contact, because contact was the most natural way for him to fly.

But the North Sea isn't like the country that Tommy knew like the back of his hand. Over the North Sea through an overcast, you fly instruments, damn it, or you don't fly! Tommy flew until he could fly no more. That's all I can say.

So we lost him.

I guess that's all there is to it. Tommy had everything that it takes to make a great flyer. He had guts, he was absolutely fearless, he was an ace in everything but respect for the laws by which a fighting ship fights not only its enemies who wear a swastika, but its enemies in the atmosphere. Tommy never learned that courage isn't enough. ☆

PICTURE CREDITS

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OCS—AUSTRALIA

(Continued from Page 24)

spent an afternoon, not speaking very much of navigation but of the last days of the Philippines and the epic flight of his big ship. Combat pilots, weather men, operations and intelligence officers, harassed depot officers, all gave us their time. We began to gain a broad perspective of the Southwest Pacific war theatre, and to comprehend the organization of the Army Air Forces. It began to add up to a single meaning that explained the early months on New Guinea and in the Northern Territory when the supplies were short and slow in coming, when the fighting equipment was against fantastic odds. The dry facts of administration began to explain the need for their existence, the need for tight organization. But it did become clearer than ever before that since it is true wars cannot be fought without paper, it is equally true that paper alone cannot win wars.

THE last weeks went swiftly. The class hurdled the final obstacles and held the affection of the second lieutenant of Infantry, who brooded over his platoon like a mother hen over her chicks, to the last. The daily drill and discipline did not ease up. It was a ninety-day course, the colonel had said, and if a man cannot take it for ninety days, the army suffers no loss. The threat of the final board hung over the camp like a pall, but it finally cleared away the Sunday before graduation—not without exacting a price. It is always hard to say good-bye to the men who have gone down.

Classification day was entirely and typically without ceremony. The AAF officers sat behind a small desk in an empty barracks, asked each man his experience and preference, wrote the recommendation and guaranteed all possible cooperation. The technical men, concerned over the possibility of administrative assignments, were assured that they had been pigeon-holed for their original departments since the first acceptance of their applications. The Panama infantry veteran stood outside, waiting his turn, biting his lips against the dreaded possibility of being chosen as an instructor. Five minutes after his name was called he walked out, stepping on clouds, inarticulate with relief. "Intelligence, boy, intelligence!" The two men chosen as instructors stood in the center of the sympathetic platoon, smiling wanly as they thought of their seven-day leave gone over the hill. The next class was to begin in five days.

We graduated at ten o'clock in the morning. At eleven, a group of the newly commissioned Infantry officers were rushed to the airport and loaded into a waiting transport that took them away on the first stage of their journey across the Hump, into the newly occupied territories of New Guinea. A small group of the Engineers looked at their orders, cursed feelingly, shook hands all the way round and reached for their baggage. They were going north the hard way—by train, then by boat to isolated, newly opened areas. And the Air Corps? The thirty of us were extremely grateful to Miami, for we had been given seven days leave—and only because a group of Miami men had arrived to fill the vacancies and relieve the pressure at last.

There was the matter of pay, of course, but we didn't mind the wait in the open area in front of the first company's orderly room. We needed time to become used to the feel of a commission. Then it was only another move to load onto the waiting trucks for the ride into town—but this time we weren't wearing the blue patch on our left shirt pocket. There was a gold bar on our collar, and a long planned dinner awaited us in that sanctum of sanctums where air-conditioning had been installed and there was, actually, ice in the well-prepared drinks.

New Guinea, with its oppressive heat, torrential rains, fetid swamps and crawling biting insects, was seven days away. That's a world of time, over here. ☆

What's Your AIR FORCE I.Q.?

Lower your mental flaps and land on the AIR FORCE Quiz for this month. Score five for each question answered correctly. One hundred is perfect; ninety, a three-point landing; eighty, good; seventy, a little bumpy, and sixty, a close call. Watch out for cross-winds. Answers on Page 56.

1. The horsepower developed by each engine of a B-24 is
a. 800 *b. 2,000*
c. 1,400 *d. 1,200*

2. The 11th Air Force Hq. is in
a. Australia *b. Hawaii*
c. Alaska *d. Panama*

3. Which word is inappropriate in this grouping?
a. Sextant *b. Octant*
c. Pelorus *d. Aerostat*

4. If you stall at 4,000 feet in a trainer, you should
a. Push the stick forward and increase engine power
b. Shut off the engine and go into a glide
c. Pull the stick back and increase engine power
d. Lower flaps and go into glide.

5. Rangoon is located
a. In Jap occupied Northern China
b. In India
c. Off the coast of Southern China
d. In Burma

6. The name given to the P-47 is
a. Marauder *b. Maryland*
c. Thunderbolt *d. Mustang*

7. In the first six months of 1943, the U. S. lost 846 planes in aerial combat. The enemy lost approximately
a. 1,000 *b. 1,300*
c. 2,100 *d. 3,100*

8. Assuming perfect visibility, the maximum distance the human eye can see from 10,000 feet is
a. 87 miles *b. 123 miles*
c. 58 miles *d. 43 miles*

9. The age limit for an Aviation Cadet is 18 to 26 inclusive
a. True *b. False*

10. General Mitchell Field is located in
a. New York *b. Texas*
c. Wisconsin *d. California*

11. A lever labeled auto-mix is used on
a. A jeep
b. PT-13 instrument panel
c. Oxygen equipment
d. Engine fuel adjuster

12. The angle of incidence is an
a. Angle at which wings are attached to fuselage
b. Instrument used by navigators in plotting course
c. Angle at which stalling occurs
d. Instrument used by bombardier in lining up target

13. What is the distinction between true altitude and indicated altitude?

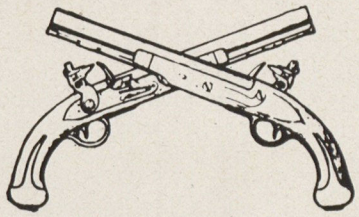
14. The RAF equivalent to the AAF rank of captain is
a. Flight lieutenant
b. Pilot officer
c. Wing commander
d. Group captain

15. The Technical Training Command and the Flying Training Command have been combined. The name of the new command is
a. AAF Training Command
b. AAF Training and Technical Command
c. AAF Flying and Technical Command
d. AAF Technical Command

16. The Medal of Honor is never awarded to enlisted men
a. True *b. False*

17. Wewak is located in
a. New Guinea
b. The Aleutians
c. Burma
d. Northern Australia

18. Identify this collar insignia



19. The average rate of parachute descent per second at near-sea level is approximately
a. 35 feet *b. 20 feet*
c. 10 feet *d. 2 feet*

20. If an unexploded land mine is found in your camp area, it is best to
a. Notify the supply sergeant
b. Remove the detonator carefully without moving the mine
c. Put the mine in a bucket of water
d. Notify the ordnance officer

FROSTBITE

FROSTBITE quickly loses its allusion to humor in high altitude flying where severe cold can make an exposed hand useless in a few seconds. The airman who, through excitement or carelessness, allows himself to get severely frostbitten while in the air subjects himself and his crew to danger and endangers the success of the mission as well. In the case of a gunner, it means the aircraft will be vulnerable in the area his gun protects.

Brig. Gen. David N. W. Grant, the Air Surgeon, reports that severe frostbite, particularly in the European theatre, is responsible for a large percentage of the hospital cases among airmen. Many of these cases have resulted in the loss of fingers, mutilated hands and permanent disability. Flight surgeons report from the field that the human element is usually a contributing factor in cases of frostbite. This means that most of them could be avoided. The problem of frostbite, therefore, like so many others in aerial warfare, depends largely upon the individual himself. The accompanying picture, showing the hand of a gunner in the 8th Air Force, reveals what can result from a few seconds of exposure in high altitudes.

FORTUNATELY, by following a few simple rules, an airman can protect himself from the serious consequences of frostbite.

In the first place, it is essential to wear the proper clothing and to wear it correctly. The clothing must be dry—even the most imperceptible moisture may lead to frostbite. Drying rooms, available at all fields, should be used. Wearing flying clothes before time for stations may cause perspiration to collect and lessen by thirty percent the efficiency of the clothing. Men with electrically heated suits should wear no more than the prescribed clothing underneath. This means one suit of winter underwear and one pair of woolen socks. There is no limit to what can be worn over the suits.

Men who have worn four pairs of woolen socks under their electrically heated boots, removed their hand protection for too long while unjamming a gun, or forgotten to test their suits before take off, have all regretted it. One waist gunner tried to change his oxygen mask at high altitude and took the easier way by removing his electrically heated gloves. In a few seconds his right hand was frozen so badly he was unable to use it again—and his formation was under attack by FW-190s. Other gunners have suffered severe frostbite because they forgot, after replacing their gloves, to plug them again into the suit's electric system.

It is also important that no clothing, including shoes and gloves, be tight fitting in high altitude flight. Such clothing restricts circulation and hastens frostbite.

Experience has shown that rubbing hands, feet and face with lanolin, olive oil or anti-freeze jelly will reduce somewhat the likelihood of frostbite because of their fat content. Flight surgeons recommend that crews on operational status rub one of these on the hands, face and feet every night for one week and then twice a week thereafter.

Despite all precautions, however, frostbite may occur. In such cases it is essential that the affected area be protected from further damage. Above all it should never be massaged and must be protected against further cold or excessive heat.

It is common sense that freezing can be of varying degrees, and should any persistent numbness or coldness of a finger, toe or portion of the face develop, it is of utmost importance that the individual report to his flight surgeon immediately. If this is impossible, the next best thing to do is warm the affected part very slowly and without rubbing. When treatment is neglected, even when the coldness and numbness does not seem severe, the results can be serious injury and permanent disability. ☆

The Wail of the Bombardier

By Lieut. Chester Turbak
24th Antisubmarine Squadron

I am now a Navigator;
I have drawn the big Mercator;
I'm a cross feed operator—
Yes I am!

Why, I plot our new position
Under any old condition,
And work hard on every mission—
Uncle Sam!

Now to be the big sensation
Of our little aggregation,
Take up "DR" navigation—
IT's the thing!

They can't get along without you;
There's that certain thing about you,
In a pinch they dare not doubt you —
You're the King!

Now the Pilot does the flying
While the Bombardier is spying
And the Navigator's crying,
"Where are we?"

Then he whips out his Weem's plotter
And he flips his lucky quarter,
Then looks down and sees the water—
"We're at sea!"

You can't be a fussy chooser;
If you are, you are the loser;
Use the E-6B confuser
When in doubt.

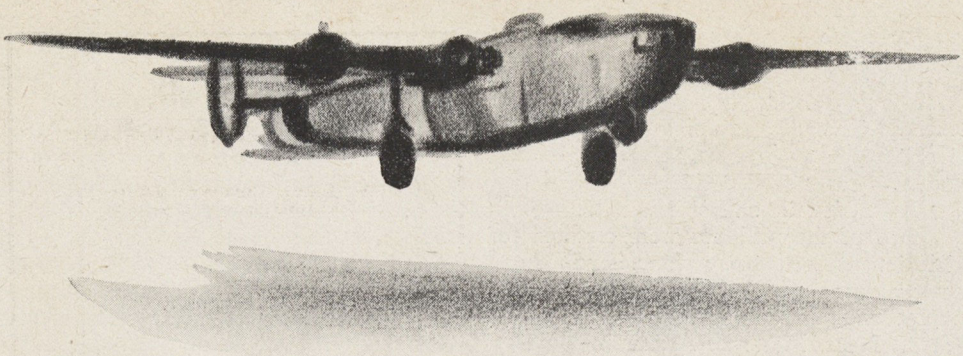
It tells you where you're goin'
Even if the weather's snowin';
If it's wrong then start a-rowin'
If you're stout.

When our plane begins a-roamin'
And the pilot is a-foamin',
Then we just start in a-homin'—
Right away!

So we tune in on the station
Till we reach our destination,
Where we get the big inflation—
Hip Hurray!

And now friends, in conclusion,
You must pardon this intrusion;
There is really no confusion
In our ranks.

With the proper inspiration
You can make your navigation
The just pride of our great nation—
WE, THE YANKS!



Bombs for Paramushiru

(Continued from Page 19)

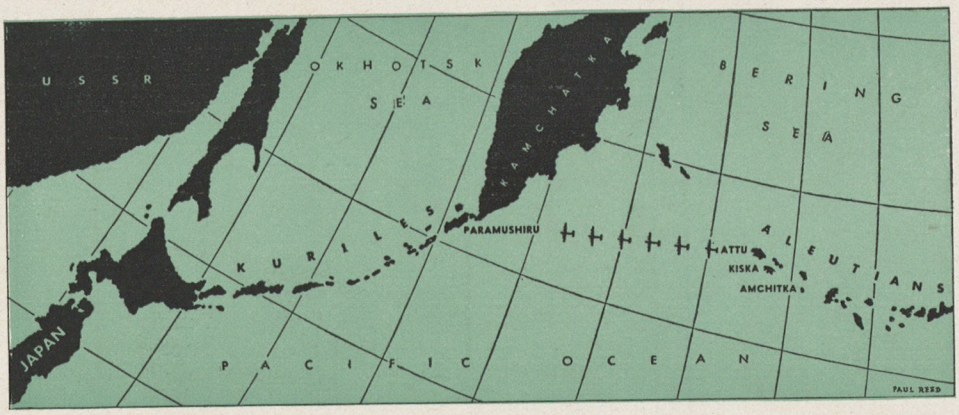
appeared to be as much of a surprise to the Japs as the first, perhaps because our approach was hidden by the overcast until we came within a short distance of the targets. They seemed to be on the alert this time, however, because planes were seen to take off the ground while we were still on our run and it wasn't long until the air was full of Zekes, Rufes, Haps and Oscars. During the running fight that continued for about 45 minutes, there were observed several other types including one Watanabe Zero, a float reconnaissance plane and one plane with fixed landing gear, painted silver with a black stripe on either side of the fuselage.

In the waters of the strait we could see a large concentration of ships.

It was a beautiful sight, the fluffy white overcast stretching away in all directions except for the big blue hole over the target and the rugged mountains on the southern part of Paramushiru sticking up through the clouds. But the scenic effect was only momentary. It was suddenly broken by the Jap planes swarming up through the overcast like bees out of a hive.

The runway extends north-south on a low plateau north of the army staging area. The Zekes were parked on a string of little T-shaped hard surface platforms beside it. As we came over they took off, apparently as each plane got ready and without any regard for formation. They taxied straight ahead across the runway, taking off from a large area to the east which extended almost to the waters of the Bay. The whole field—runway, parking platforms and all—must have been as level as a billiard table because they seemed able to get off in any direction.

The anti-aircraft crews were on the job this time, and puffs of smoke started blotching up the sky before we were actually over the targets. It was black, apparently of large caliber, and pretty hot toward the last. Fortunately, it was accurate only for altitude and not for course. It appeared to be of the barrage type, aimed for a certain altitude over the target. As at Kiska, the most accurate fire seemed to come from ships in the harbor, rather than the shore batteries.



"A" flight got away its load including the incendiary clusters from 11,500 feet, one string hitting a group of large buildings in the naval base area on Shimushu and a second about a hundred yards to the left in another building area. The third disappeared into a low cloud so that the result could not be observed. The interphone sounded as though some kind of a convention was going on as explosions and fires from the incendiaries were observed by various members of the crew.

After all the bombs were away, "A" flight made a diving turn to the left, leveled off at about 5,000 feet and followed the southern coast of Shimushu to Nakagawa Bay whence it headed out over the sea toward home.

"B" flight proceeded over the Kashawabara staging area dropping its eggs from between 10,000 and 11,000 feet. All struck in the target area along the shore, where explosions and fires were seen. One pier was demolished and a vessel beside an adjoining pier overturned. After completing its run, the flight continued around the south post of Shimushu to join "A" flight for the return trip.

Just before "C" flight reached its target, the shipping in the strait, Captain Wadlington noticed that some of the larger vessels were hidden by low overcast and made a sharp turn to the south, planning to come back over the army staging area for his run.

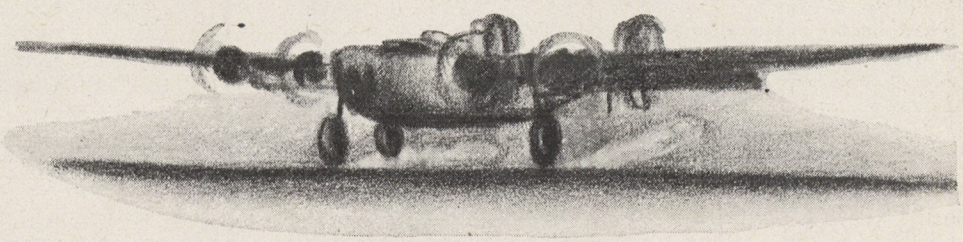
ALL three planes executed the right turn but when the flight made a second turn of 180 degrees to follow the northerly course, Captain Hoffman, apparently misunderstanding the maneuver or, perhaps, having some difficulty with his plane, continued to the east. His plane was last seen flying southeast at about 12,500 feet, pursued by two Zekes which, however, were still out of range. His plane did not return to the home airport and it is not known whether he was forced down on some other landing place.

The other two ships of the "C" flight dropped everything they had on the staging area from 12,000 feet. The bombs struck a large warehouse and some adjoining buildings which were seen enveloped in smoke and flame. After the run both ships dove to about 1,000 feet to take advantage of the cloud cover as they followed an easterly course across the northern part of Shimushu.

While the anti-aircraft fire did not bother us a great deal, despite its intensity, the Jap planes did. There were about forty in all, mostly Zekes, armed with two or three machine guns and some with cannon. Six Mavis four-engine flying boats were on the water in the harbor and about 25 or 30 other planes could be seen on Bettobu Lake east of the naval base, but none of these took off.

The attacks lacked coordination and were not always pressed determinedly but they kept after us until we were well on our way home, a few of them for forty or forty-five minutes.

They attacked alone or in pairs and some, probably the green pilots, veered



away before coming in range, even when they had numerical superiority. Their favorite angles seemed to be 5 and 7 o'clock from which they could use the two vertical stabilizers as a shield to protect them from the top turret and tail gunners. However, several times attacks were made from the front at about 11 o'clock, perhaps for variety. Most attacks were made from our level although occasionally one dived and came up from below.

Most of our gunners had come up from the States as replacements only a few months before and had never had an opportunity to fire at a Jap plane until that day. Nevertheless, they worked like veterans, warning each other over the interphone as the enemy was getting out of range of one gun and within range of the next man's. They were cool as cucumbers throughout the whole attack, although there was hardly a plane in the fight that didn't have three or four Japs buzzing around as we started the return trip.

We got five planes that were confirmed and six probables which we are certain would have been confirmed had it not been for the overcast. We could see the probables diving into the clouds but since we couldn't see them hit the water no confirmation was possible. Six more were damaged.

Mistakes in 'On The Line' Picture on Page 44

(Reading from left to right)

1. To remove the tire from the hub with a pair of screw drivers is practically a job for Superman. Friend, use a tire iron which is blunt on the end and won't cut into the rubber. Reference: TO 04-5-10.

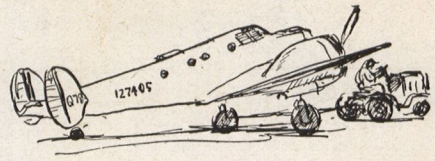
2. Oh no, not that, please! The ladder leaning against the leading edge of the stabilizer will harm the skin fabric.

3. Bad business to insert that twelve-inch crescent wrench between the leading edge of the elevator and the trailing edge of the stabilizer to hold the elevator in horizontal position. A pair of hands is the required "tool" to hold the elevator in place.

4. You, standing there in front of the jack, it's dead wrong to take dents out of a trim tab with a pair of pliers. Dents are removed by pressing the trim tab between two wooden blocks. Reference: TO 23-15-1.

5. Caught in the act, pal! You ought to know better than to stand on the stabilizer. It isn't constructed to withstand a man's weight. Besides those GI shoes are plenty tough on the airplane's skin.

6. The same guy up there has the wrong version of "safety in numbers," namely, the number of boners he's committing are in opposition to safety! To remove a bolt from the rudder hinge, hammer and screw driver are the *wrong* tools; they will ruin the bolt, and should the screw driver slip it will damage the rudder skin. A punch or drift is to be used here. Reference: TO 01-65BC-2. And by the way, that long screw driver in his breast pocket can jab him or someone else in the ear.



Two of the positives were credited to Lieutenant Lockwood's plane. Two Zekes, coming up from below, attacked simultaneously, one at 11 o'clock and the other at 5. Lieut. Merle E. Arthur, navigator, gave the one coming in at 11 a burst at about 500 yards. The Zeke broke off and trailed smoke as it went into a dive and exploded after diving about 2,000 feet. Staff Sgt. Walter Succov, tail gunner, and Sgt. David L. Carter, belly gunner, got the other one from about 900 yards. The Zeke pulled up into a stall and fell off on the right wing with flames coming from the engine. It dropped into the ocean. A Hap followed this one down, circled the wreckage and climbed up to follow the plane again, but staying at a pretty safe distance.

Lieutenant Lockwood's plane, still plugging along on three engines, was damaged considerably in these and other attacks and began to lose altitude. The crew had a field day throwing things overboard to lighten the plane, and the ship was pretty well stripped in short order. It descended through the overcast and was flying at only about 200 feet when the crew got one of those thrills that brings your heart right up into your mouth. All three motors quit together due to a vapor lock. With exceptional presence of mind, Lieutenant Lockwood quickly threw on his booster pump and turbos and held his breath. Sergeant Carter in the belly turret was only fifteen or twenty feet above the white caps when all three motors started again. The plane gathered headway and climbed to a safe altitude.

While all the ships got plenty of attention from the Japs, Lieutenant Smith's plane, the last one over the target, probably got more than the rest. He became separated from Captain Wadlington in the cloud cover at about 1,000 feet, and had a running fight with ten Japs who followed him across the northern part of Shimushu Island and more than a hundred miles out to sea. At one time there were three Japs on each wing and four on the tail. Three were shot down positively and one probably, while two others were damaged in this melee.

Staff Sgt. Ira Edwards, waist gunner, got one of the positives—a Rufe that peeled off, did a vertical roll and came down from above. Edwards got in several bursts, and the Rufe did a wingover and burst into pieces almost in front of Smith's plane.

Staff Sgt. A. Dumas, tail gunner, knocked a piece off the left wing of a Zeke coming in from 7 o'clock. It went out of control at about 1,500 feet and dove straight down into the water.

Staff Sgt. William C. Nichaus, waist gunner, accounted for the two-float Watanabe Zero, with tracer fire seen to enter the cockpit. The plane fell off into a spin from 1,500 feet.

More than twenty passes were made at Smith's plane during this running attack but the crew, in a fine display of teamwork, kept the Japs so far away that only a few small caliber bullet holes were noted in the fuselage when the ship was checked after the trip.

On the way back two Japs were seen from Lieutenant Lockwood's plane descending by parachute about thirty miles east of Shimushu and two planes were seen not far away burning on the water. However, there was no way to tell how the planes had been brought down or whether the two pilots had bailed out of the two planes on the water, since they were beneath the overcast and none of the action had been seen.

Later, Lieutenant Pottenger radioed that he had lost No. 4 engine and was unable to feather the prop. He also reported one supercharger was on fire. "A" flight throttled down in order to enable him to keep in formation but his plane continued to drop behind. He was last seen about 3,000 yards to the left as the flight went into a cloud formation at about 5,000 feet.

The other seven ships returned to Attu, Lieutenant Lockwood's plane only a few minutes late despite its damaged condition. The Paramushiru mission was officially over but we were not quite through with the Japs. Returning to our home base the following day, we flew over Kiska and made what proved to be our final bombing attack on that target. ☆

Answers to Quiz on Page 53

1. (d) 1,200 horsepower.
2. (c) Alaska.
3. (d) Aerostat.
4. (a) Push the stick forward and increase engine power.
5. (d) In Burma.
6. (c) Thunderbolt.
7. (d) 3,100.
8. (b) 123 miles.
9. (a) True.
10. (c) Wisconsin.
11. (c) Oxygen equipment.
12. (a) Angle at which wings are attached to fuselage.
13. The altimeter reading gives you indicated altitude. True altitude is obtained from the indicated altitude by correction for atmospheric conditions and instrument errors.
14. (a) Flight lieutenant.
15. (a) AAF Training Command.
16. (b) False.
17. (a) New Guinea.
18. Military police.
19. (b) 20 feet.
20. (d) Notify the ordnance officer.

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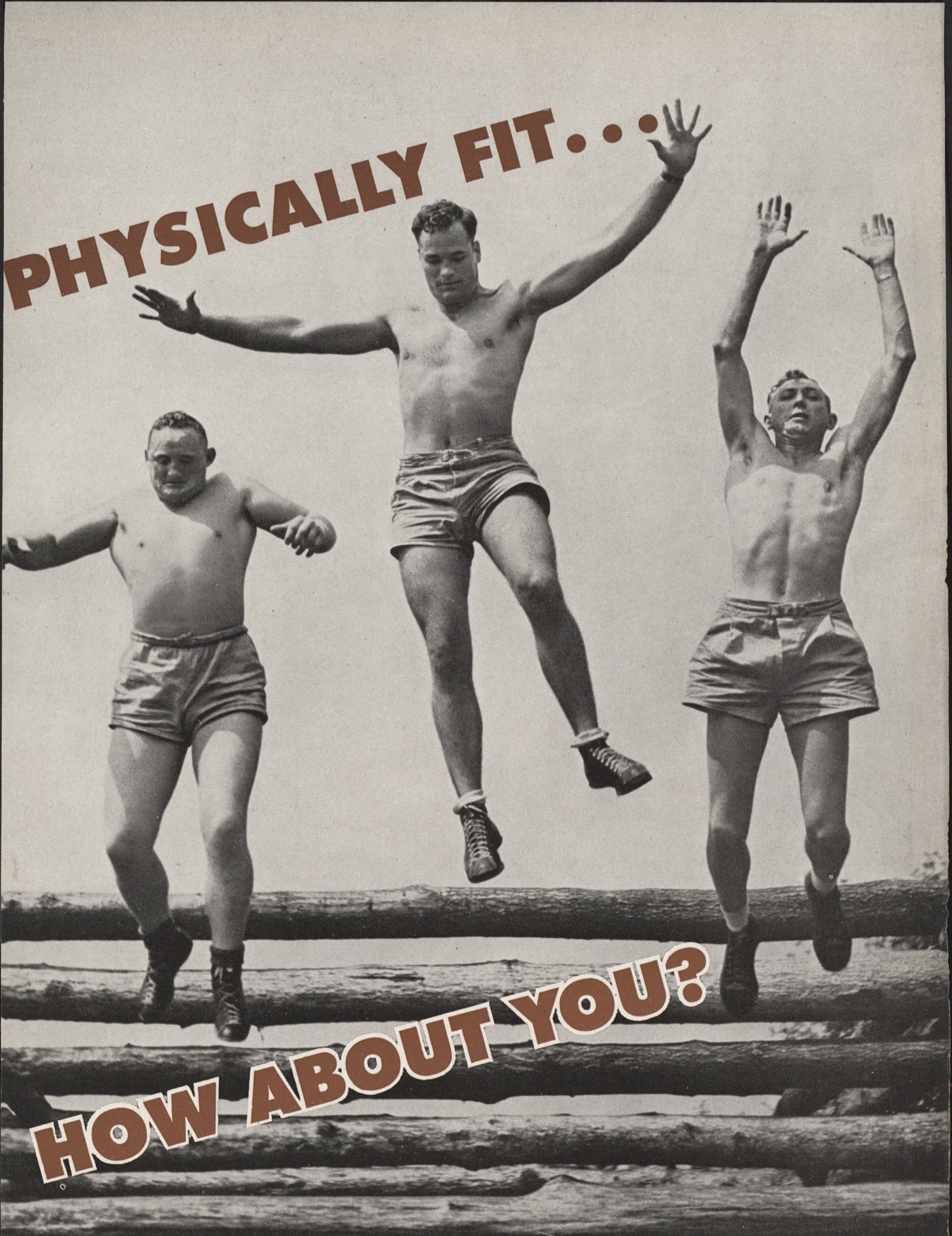
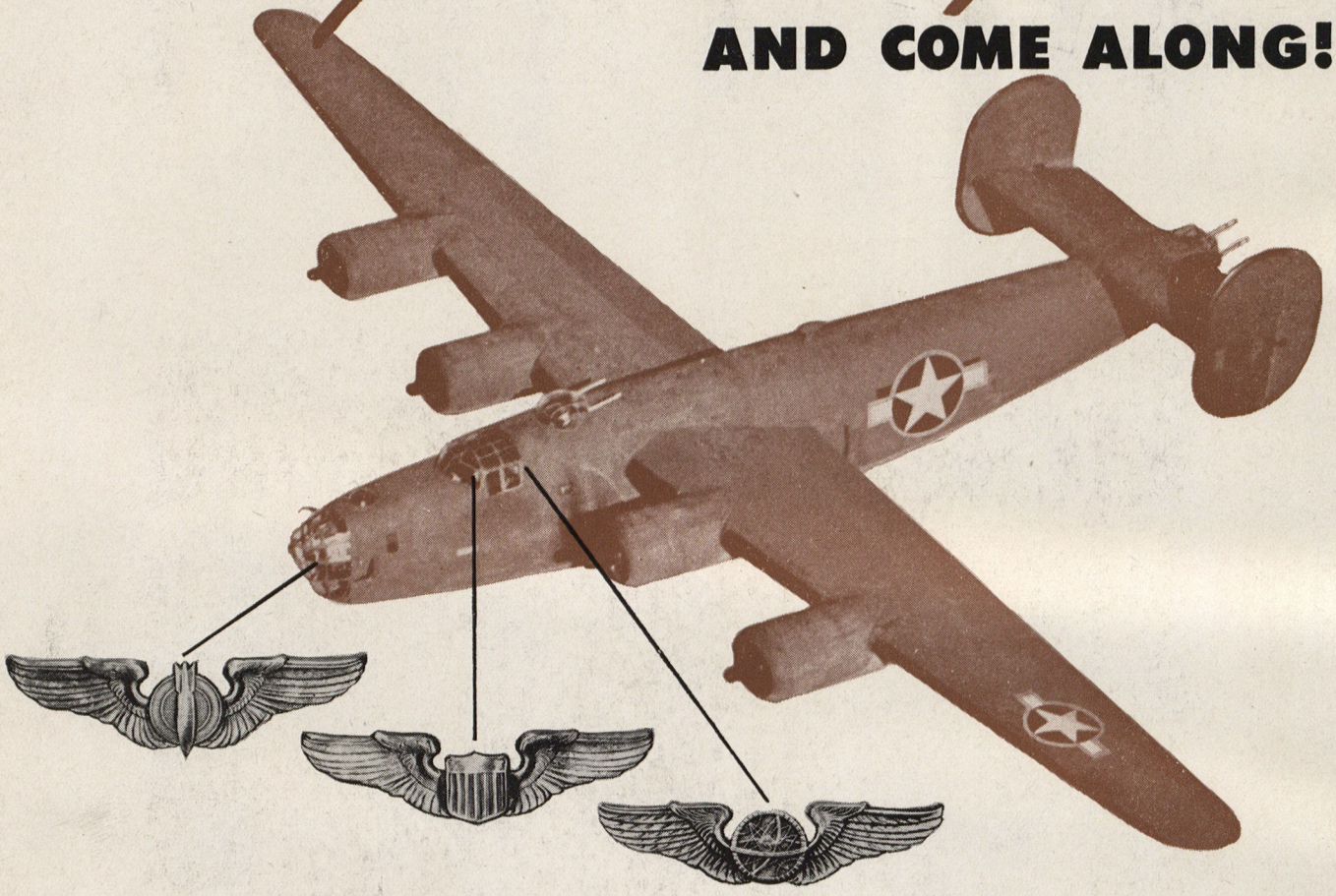

PHYSICALLY FIT...
HOW ABOUT YOU?

THERE'S A PLACE FOR YOU ABOARD . . .

Win Your Wings

AND COME ALONG!



Enlisted men between the ages of eighteen and twenty-six inclusive, whose organizations have not been alerted for foreign duty, are eligible to apply for aviation cadet training to become bombardiers, navigators or pilots. Application blanks, AGO Form 60, can be obtained from commanding officers, the nearest Aviation Cadet Examining Board, U.S.O. clubs or recruiting offices.

Army regulations (AR 615-160) provide for transportation, at government expense, of enlisted applicants for air crew training to the nearest Aviation Cadet Examining Board to determine qualifications, if one is not located on your post.

Your seventeen-year-old friends may also apply for this training by qualifying for enlistment in the Air Corps Enlisted Reserve.

If you previously applied for air crew training and were rejected for physical reasons, you may try to qualify now under the relaxed physical standards recently announced.

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