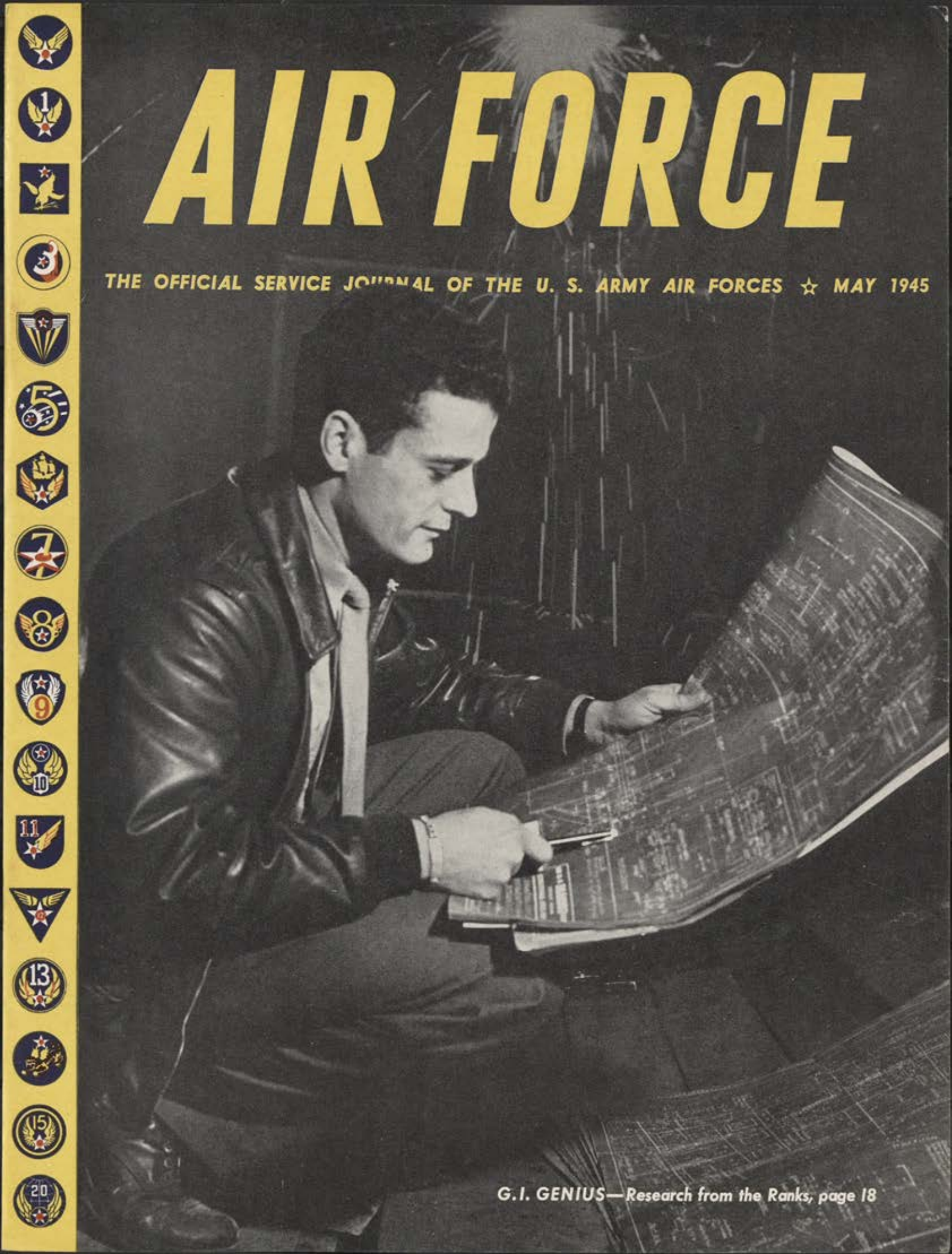
AIR FORCE

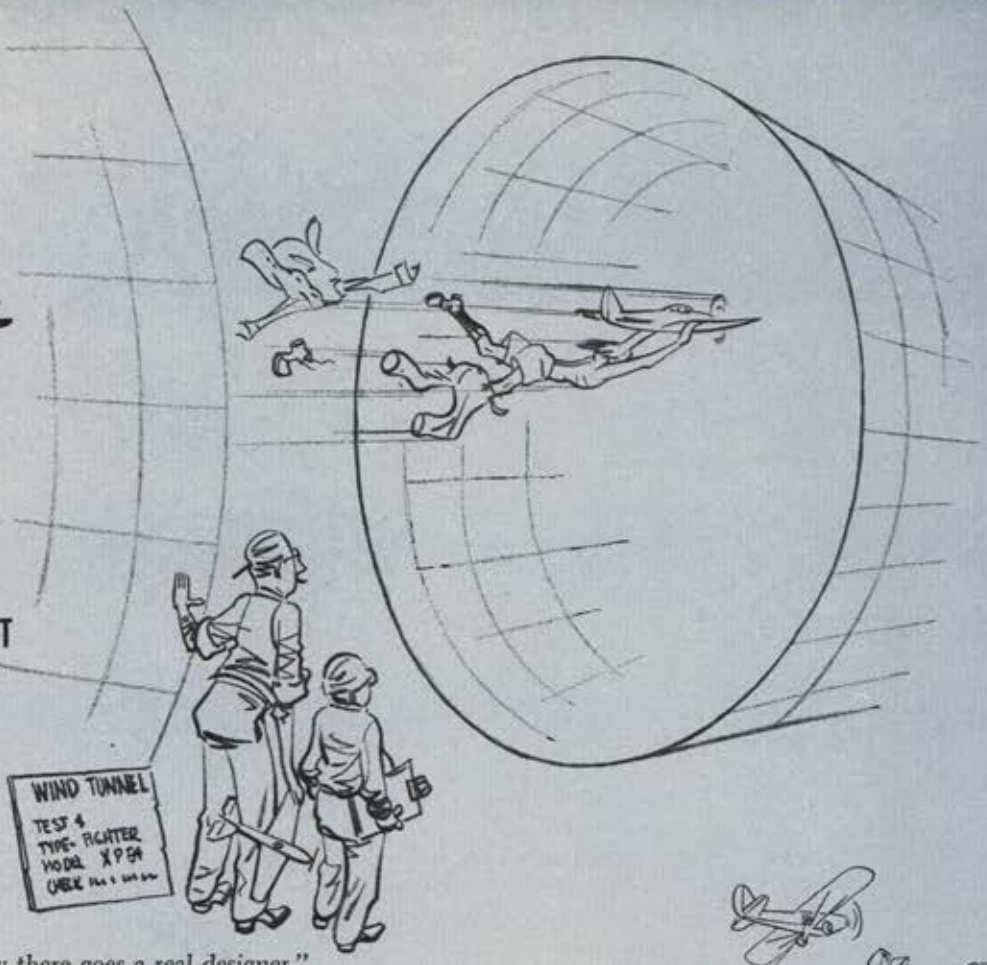
THE OFFICIAL SERVICE JOURNAL OF THE U. S. ARMY AIR FORCES ☆ MAY 1945



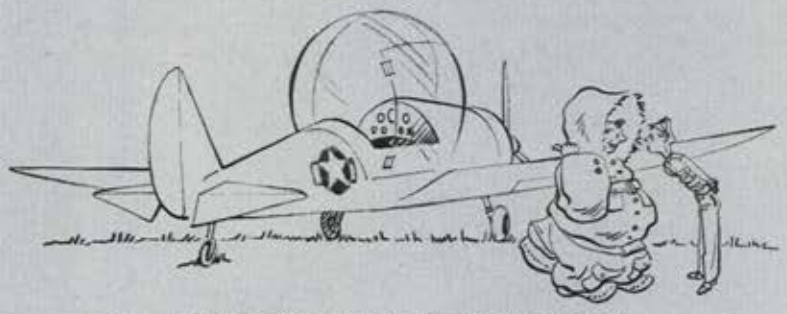
G.I. GENIUS—Research from the Ranks, page 18

Wright Field

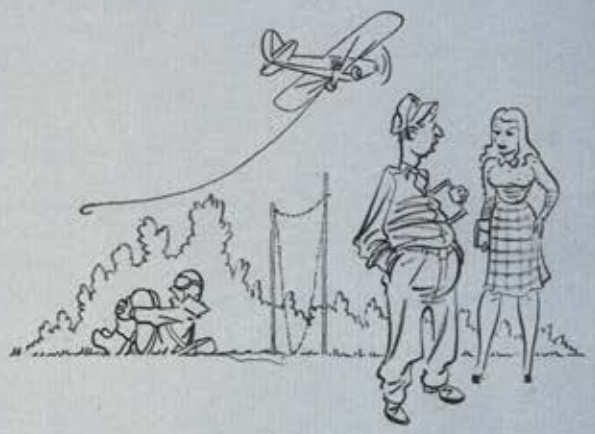
by CAPT. WM. T. LENT



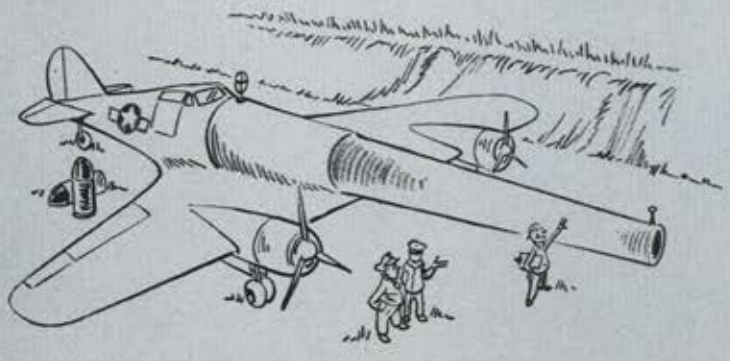
"... Now there goes a real designer."



"... and then they had to redesign the cockpit to accommodate this new flying suit."



"I heard you were looking for pickup volunteers."



"Robins feels confident that he's solved the firepower problem."

"Jeez, I'll be glad when we finish these altitude tests!"

Rendezvous

Service Ribbons

Dear Editor:

Almost every Air Force officer and enlisted man returning from overseas is wearing the "American Theater" ribbon.

Has Section 1, Circular 68, WD, 1943, paragraph 3, been superseded?

Some of us, too old for troops, but not too old for service in the American theater, are jealous of our few service ribbons and it is a bit irritating to see a 20-year old soldier wearing, for instance, a Mexican Border Ribbon. Honest, I saw it.

Curious

See article on Page 25.—Ed.

New Plane?

Dear Editor:

Recently I had the experience of seeing an unusual aircraft. The plane was an exact duplicate of the B-24 but had only a single rudder. Is this a new aircraft as most of my friends say it is, or is it a new version of the B-24 as is my opinion?

Pvt. Chas. Palmer
Staten Island 2, N. Y.

There are two planes which might qualify as the one seen by Private Palmer, and lack of more specific information makes it impossible to say conclusively which of them it was. They are the PB 4Y-2, a Navy job, and the newest of the B-24s. Both are, generally speaking, of the basic B-24 design and both have a single rudder. The Navy plane, however, has a side blister, is a number of feet longer in the fuselage, and has a higher tail. All things considered—including the comparative number of the two planes in existence—the plane seen by our correspondent, was probably PB 4Y-2.—Ed.

Letter From Our Cover Girl

Dear Editor:

I have been receiving a lot of letters from my friends, and also from fellows whom I've never met telling me how they liked the cover on the October issue. Some were from the Pacific, some from the States, and from over here in the ETO. How your magazines get around! I have been hearing a lot of nice things about the recent issues, everyone around here is always anxious to read the next one.

Just today I was scheduled to make my first trip to Germany, 4 miles from the Rhine, but the strip wasn't ready and we must wait a day or so. I'm looking forward to going up there very much, not only because of the experience, but there must be a lot of boys who need to be carried out as soon as possible.

While in Marseilles, I had the opportunity to go to Italy and I imagine you know what's coming! Yes, I saw my husband, we had three wonderful days together in Rome. The last he had heard from me I was in N. Y., so you can guess how surprised he was when I called up from a fighter base near Pisa and said, "Honey, will you come over and pick me up?" Honestly, I didn't know quite what to say,

(Continued on Next Page)

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AIR FORCE

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

DEPARTMENTS AND FEATURES

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How Sharp are YOU?

A Photo test of Your Observational Accuracy

Get your mind off spring, pinups and bock beer, and concentrate on this photo for 60 seconds. Yeah, there are just four fighters flying over the Alps but you better look close or you'll have trouble with the questions which you'll find on Page 45. Score 10 for each correct answer. 100 is perfect. Of 25 men we tested, top score was 80.

HOW SHARP ARE YOU? Turn to Page 45

Rendezvous

(Continued from Page 1)

and it's sure he didn't. After 22 months, we almost had to get acquainted all over again. In December I had leave and we spent three more days in Rome. We're having our honeymoon on the installment plan. He was pleased with my picture on AIR FORCE, was as proud as could be.

There has been no end of happenings here. On my birthday, which was February 24, I received my promotion to 1st Lt., and day before yesterday our squadron celebrated a year overseas. And the very latest, we have been awarded the Air Medal for 50 evacuation missions. We're very proud of them. As the girls say, "Now we wear what looks like 'fruit salad' on our blouses."

Frances Sandstrom,
1st Lt., ANC

Flight Nurse Sandstrom appeared on the cover of the October AIR FORCE *. . . remember?—Ed.*

Where Credit is Due

Dear Editor:

Being a former "Snooper" myself, I was greatly elated on reading your article published in the March issue of AIR FORCE entitled "Snoopers."

I think a great deal of credit for our successful night operations though, should be given to Lt. Col. Leo J. Foster, our original squadron commander, and Maj. Francis B. Carlson, our humorous operations officer.

These two officers displayed the highest courage and efficiency in inaugurating "our" system of nocturnal bombing. Colonel Foster, by his endless efforts, enabled the "project" to be recognized as a squadron on January 1, 1944. Since then, the name "Snoopers" has become known to every 'Seabee,' 'Cavalryman' and 'Infantryman' in the South Pacific.

Thanks again for the swell, well-written article. AIR FORCE sure keeps a technically correct publication.

Capt. Vince Splane,
Park Ridge, Ill.

Righteous Indignation

Dear Editor:

Pardon me for the intrusion, but I just read your January issue and I wished to get in touch with a Cpl. William Ryan who wrote a letter that was printed in your "Rendezvous" column.

Before I finished reading his letter I felt sure I was going crazier than usual.

I wish to state that I don't like your 2d Lt. Charles Ullritch. Any pilot who is so hot he singes the eyebrows off a girl and sets her hair on fire from the heat of his "hot" piloting should be isolated on some small isle, or sent over here to Italy.

In my opinion American womanhood is too valuable for Lieutenant Ullritch to mutilate in such a manner—even if the poor guy can't help it. After he has been overseas maybe he'll realize it. Tell him either to learn to control his "hot-stuff" or rent an icehouse for his personal barracks.

Though to tell the truth I'd like to have him meet Helen Warbly. She has made a

specialized technique of the old pre-war "cold-shoulder" business. Just before I came overseas a buddy of mine asked her for a date. She turned on her cold shoulder. Today, a year later, he is still in the hospital at St. Joseph, Mo. They keep him in a special furnace with a fire burning continuously at 200° F (higher temperature might kill him) and he is just beginning to thaw out.

HEBA-HABA-HUBA—23 SKIDOO,

Pfc. Vaun Benuamin,
APO 520

We see your point. HEBA-HABA-HUBA to you too.—Ed.

An AAF Wife Speaks

Dear Editor:

Your AIR FORCE magazine has been one of those more or less denied privileges since my husband returned overseas. I first read AIR FORCE when he was stationed in Texas for school and have always looked forward to being able to get to read it, as there seemed to be only a few copies in circulation.

He is with the 13th Air Force in the Pacific and reading your articles about his "fighting 13th" as well as the many interesting notes about the B-24s, etc., somehow brings me closer to what he's really doing and certainly gives one satisfaction.

Thank you for bringing them to the attention of the civilian public as well as Army personnel.

Is it possible to subscribe to this magazine? I'd like to keep the copies for our son to read someday.

Thank you for helping to give me a deeper insight into the feeling of our combat men who fly and fight.

Mrs. James W. Perry
Brooklyn 25, N. Y.

Thank you. For subscription details see DISTRIBUTION, *bottom of Page 1.—Ed.*

AACS In Abadan

Dear Editor:

I just finished reading Lieutenant Troster's letter in February's Rendezvous column. I can support every statement of Lieutenant Troster's as to weather. But I would like to correct him on another point.

The one statement with which I disagree is concerned with radio facilities in Iran. I was stationed at Abadan from June to September of 1943. He made the claim that there was no radio except the local tower. There he and I differ. I am a member of the AACS and I can verify that at the time he was there, we had a class A station which included air-ground facilities for both voice and CW with a range of at least 300 to 400 miles.

That he didn't make full use of our services is certainly not the fault of the radio men who suffered in that sweltering climate with him. It took the publication of a direct order and establishment of prearranged check-points to force many pilots flying scheduled routes to avail themselves of the AACS facilities on those routes.

S/Sgt. Walter M. Goldstein,
Kelly Field, Texas

(Continued on Page 58)

In This Issue

Pvt. Philip P. Antonatos, who is shown on the cover of this issue working in a wind tunnel, is a member of the GI "brain trust" of ATSC at Wright Field (See "Research from the Ranks," Page 18). Although this 28-year old wizard of the wind tunnels was inducted into the Army as recently as November 1944, he is a veteran of Wright Field's laboratories, where, as a civilian, he began employment as a junior aeronautical engineer in 1940. Pvt. Antonatos received his engineering degree at Rensselaer Polytechnic Institute, Troy, N. Y., and was employed for a year by Pratt & Whitney before going to Wright Field. He is now back doing his civilian job in uniform. The pay is not so good, but that has no effect on the enthusiasm he puts into his work. The photograph was taken by Eugene Furnish of ATSC's Technical Data Laboratory.

☆

Our correspondent who authored "Practice Makes Perfect," appearing on Page 29, Capt. Larry Bachmann, has been flying far and wide throughout India, Burma and China. In his latest report, Larry informs us that he was wearing a sergeant's stripes. No, it isn't a demotion. He was packing an extra set of thin cottons for a quick hop up north when a sergeant reminded him that China's northern frontiers are damned cold. There wasn't time to buy any heavies, so he borrowed the obliging sergeant's woolens, stripes and all. . . . Larry also explains a Burma mystery of how the boys of Air Service squadrons always managed to be on the spot to greet a troupe of beautiful USO girls the moment their plane landed. Communications was accused of being in cahoots with the ASC lads, giving them advance notice of the beauty bevy's ETA. Protested Communications, "If we knew, wouldn't we be the first on hand ourselves?" One day a crypto Joe was checking a file of radio messages between Air Service outfits. He became suspicious when he found the words "cheese" and "cake" appearing at regular intervals in otherwise routine messages. The mystery was solved when a further check revealed that whenever the USO group left one base, the ASC boys sent a message with one of the key code words inserted to their colleagues at the next scheduled stop on the tour.

☆

Take a look at the photographs of Cologne bomb damages on Pages 32 and 33, and you will see the irony of a sign posted in the city, with the following quotation from Hitler: "Give me five years and you will see what I shall make of Germany." . . . T/Sgt. Roger Coster, AIR FORCE staff photographer in Europe, who took the pictures, also writes that "I find that I only have to take a cigarette out of the package and the master race jumps to give me a light. . . . I have seen London, Paris and part of Germany. It's not pretty. In its way Paris is still beautiful, but there is something extremely sad that takes all the joy out of the city. To see Paris thus, saddens me. It was a great city." (Paris is Coster's home town.—Ed.)

☆

No fatiguing task was the research for Operational Fatigue Among Returnees (Page 11). Maj. Arthur Gordon secured most of the facts in pleasant discussion on the beach at St. Petersburg, Fla., with Lt. Col. Roy R. Grinker, Executive for Medical Services at Don Ce-Sar. On his return north, Major Gordon presented himself at an Army dispensary for an overseas physical. When a young lieutenant psychiatrist who was examining him found that Gordon had already served 18 months overseas, he nodded his head understandingly and started asking pointed questions reminiscent of the St. Petersburg discussions with Colonel Grinker. Had it taken eight months on the AIR FORCE editorial desk to give him combat fatigue? wondered our Major. It was all right, though, for a few days later the medical report arrived marked, "No symptoms of psychoneurosis." ☆

T/Sgt. Roger Coster, perched above on Cologne rubble, is definitely not a sightseer. As staff photographer for AIR FORCE, he is covering battle-scarred European war areas.

"I followed him out and found myself floating toward what appeared to be the vortex of a battle."

RHINELAND RENDEZVOUS

BY CAPT. ERIC FRIEDHEIM

AIR FORCE *Overseas Staff*

ILLUSTRATED BY SGT. LOUIS S. GLANZMAN

It was the pay-off moment of the war's greatest airborne assault. Our correspondent stood at the door of the flaming C-46. Some 800 feet below the battle already was raging. His story of what he jumped into tells how airborne troops spearheaded the big push

Weather on the morning of D-day was even better than the optimistic forecast. The sky was cloudless and spring had settled into the forests and fields surrounding the airdrome. Slowly the C-46s crawled down the narrow strips to the runway, churning up clouds of dust and sending deep thunder across the green French countryside.

The greatest airborne operation of the war was about to get underway. By 1000 hours the spearheads of a vast armada of transports and gliders, escorted by thousands of Allied fighter planes, would cross the Northern Rhine to support an all-out assault launched a few hours earlier by the 21st Army Group. We had come down to 9th Troop Carrier's 313th Group to fly as observers on this mission which was to involve the largest single concentration of troops yet carried into enemy territory by air.

The day before, Maj. Gen. Paul L. Williams, commander of U. S. troop carrier forces, told us what was to be accomplished between the hours of 1000 and 1200, on March 24. Two divisions, one American and one British, were to be

dropped by glider and parachute into a small area just east of the river, near the town of Wesel. Chief purpose of the landings was to establish a firm bridgehead for the advancing ground armies. Williams, whose troop carriers had participated in six previous airborne landings, expressed the belief that this operation might well be one of the climactic blows of the final round of the war in Europe.

The field order called for employment of approximately 1600 troop carrier aircraft and 1400 gliders to ferry the American 17th and British 6th Divisions to the landing and drop zones several miles across the Rhine, northeast of Wesel. It was an ambitious and hazardous undertaking, for it was unlikely that tactical surprise could be achieved. Our commanders were certain that the enemy anticipated a major Allied airborne attack somewhere along his Rhine positions. As countermeasures, the Germans might send up sizeable units of the Luftwaffe, possibly some jets which, because of their speed, might elude the Allied fighter escort. They also would count heavily on antiaircraft fire, for much of their flak defense is highly mobile and can be shifted from one area to another as the need arises. Finally the enemy would rely on small arms fire which often is highly effective against carrier aircraft and gliders coming in at low altitude. But all these threats had been carefully considered and Allied military leaders were satisfied that the mission could be executed with minimum losses for 72 hours.

Preceding D-day, thousands of bombers and fighters of the 8th and 9th Air Forces and the RAF swept over the Rhine seeking to reduce the enemy's gun positions and to cut communications leading into the landing area. Fortresses and Liberators concentrated on enemy airfields, particularly those that harbored jets. Intensive artillery barrages also were expected to drive the Germans inland before the airborne troops arrived. Air cooperation on the day of the landings was to be as extensive as that of the Normandy invasion. The 8th AAF promised to mount more than 2500 bomber and fighter sorties to help isolate the battlefield, while thousands of fighters and medium bombers of the 9th Air Force and the RAF were assigned the task of guarding the transport and glider stream and of striking at any flak positions that had been missed during the previous softening-up process. A force of Liberators would bring in additional ammunition immediately after the landings.

The overall plans involved little radical change in troop carrier tactics except that some of the C-47s would tow two gliders instead of one, and that formations of C-46 Commandos were to be used for the first time. Ten drop and landing zones had been plotted east of the river to which the airborne train would proceed in two parallel columns flying two miles apart. Mobile beacons had been installed across northwestern France and Belgium to assist the navigators, and a special control team would go into the invasion area in radio-equipped gliders to establish immediate communications.

I elected to fly with the 313th because this group was using the new Commandos. Each of our transports, with their greater payload, was carrying 30 paratroopers plus large quantities of supplies and ammunition. The C-46s of the 313th were transporting an entire paratroop regiment to the battlezone. The group was divided into two serials, and I had been assigned a place in the lead plane of the second serial. Our estimated time of arrival over the drop zone was 1020, and when I climbed aboard with 1st Lt. Bob Reeder shortly after 0700, the paratroopers already were in their places. They were quiet and tense as Reeder went forward with 2nd Lt. Albert Strohm, the copilot, to warm up the engines.

Shortly before 0730, Reeder wheeled the big transport into the runway and we were off. Peering through the

"... there was considerable machine gun fire coming from a patch of wood..."

window we caught a quick flash of the group's first casualty. One of the Commandos had cracked up on take-off and ploughed through a string of vehicles parked near the control tower. Reeder got his plane off smoothly and climbed several thousand feet. There followed 30 minutes of circling while the group maneuvered into formation, and by 0800 the 313th slid into position near the head of the long transport column. 1st Lt. John E. Hawkinson, the navigator, squinted through the dome blister and announced "We're on our way."

The tenseness and grim readiness of the paratroopers was caught by T/Sgt. Roger Coster, AIR FORCE photographer, in this photo which he took inside one of the C-46s as it waited to take-off.

First casualty was this Commando that veered off runway during take-off, ploughed through string of vehicles near control tower. Four paratroopers were injured, two jeeps flattened, truck damaged.

The run to the Rhine was smooth and uneventful. To our left we could see the column of C-47s, Horsas, CG4s and giant Hamilcar gliders stretching back to the horizon. Occasionally our fighters knifed past the slow-moving stream, ranging ahead into the danger zones. Fifteen minutes before we reached the river, Reeder flashed the alert to the jumpmasters. Tight-lipped, the troopers checked their weapons and made ready to hook up. The rest of us put on our flak suits. The three minute warning came as we flew over the Rhine, and Reeder brought the plane down to 600 feet and held her level. Haze and battlesmoke shrouded the entire area. Along the east bank the ground was barely visible. Off to the right appeared a few black bursts of flak. Reeder kept straight on course, for the troop carriers are prohibited from taking evasive action before the troops have jumped.

Four miles in he rang the bell. The paratroopers streamed out of the Commando's two doors. They cleared the plane in seven seconds and Reeder immediately increased his speed. There was more flak now, dangerously close, but Reeder continued past the drop zone before trying to make his run. Ours being the lead plane, it was necessary for us to go in deeper to avoid jamming traffic behind.

Suddenly a string of bullets ripped through the plane's belly. All of us tried to lose ourselves inside our flak suits. Finally Reeder started his turn. He almost had the nose of the Commando pointed westward when we heard the ugly sound of metal slamming through the fuselage. Within seconds the starboard engine spouted flames. The ship shuddered from the impact of another burst, and fire danced across the left wing. Thick smoke billowed into the cabin from the sides. The navigator rushed forward to the cockpit and Reeder gave the bail-out order.

Ripping off the flak suit, I groped my way to the right door, pausing momentarily to look down. We had been climbing in the turn, and I judged our altitude was about 800 feet. While I was hesitating at the door, someone hurtled past shouting "Come on! What the hell are you waiting for?" I followed him out and found myself floating toward what appeared to be the vortex of a battle. I could see the flashes of guns and hear bullets whipping past me. In the air the sky was filled with a tangle of gliders and transports, and I saw one spiral down and crash with a loud explosion in a field. Slowly I drifted over some buildings, and finally was jolted down beside some railway tracks.

I saw no one in the vicinity, but there was considerable machine gun fire coming from a patch of wood some 50 yards away. Unbuckling the chute, I crawled into a small lumber shed, which stood close to the tracks, and hid beside a stack of planks. It was a dubious sanctuary but, having lost my pistol and helmet in leaving the airplane, the lumber shed was better than nothing. Just as I had secreted myself, a Horsa glider soared down across the tracks, apparently out of control. A telegraph pole sheared off a wing, and with a sickening shower of splinters the glider crashed into a clump of trees. No one stirred in the wreckage and it appeared that all its occupants had been killed instantly. More gliders were coming down, some of them flaming, others with their wings crumbling in mid air. A few were trying to glide into a field next to the woods on the other side of the tracks, but with the low-hanging haze their pilots were having difficulty clearing the trees.

After I had been in the shed for 10 minutes, the ma-

(Continued on Page 28)

DODGING FLAK

Liberator of the 15th Air Force comes through intense and accurate flak barrage over Vienna with smoke trailing from one of its engines.

Our flyers have learned to listen carefully when flak officers speak

BY LT. HENRY W. MARSHALL
Hq. AAFPOA

Flak officers, former AA artillerymen, are now assigned to each Air Force. Their job is to help bring as many of our aircraft as possible safely home by determining what course of action will minimize the effectiveness of enemy antiaircraft fire. Certain dives, turns and changes of speed made at just the right instant may mean the difference between safety of aircraft and loss of life.

Flak officers contend that flak can be beaten if flyers have a clear picture of what they are up against. For each type of antiaircraft fire they can determine a course of evasive action which will greatly reduce the danger of being hit. They can tell pilots just what action to take when they recognize any type of antiaircraft fire. There are several methods of avoiding flak if the problem of the enemy gunner is understood and the type of AA fire recognized.

The three types are: Continuously Pointed Fire, Predicted Concentration, and Barrage Fire. The first is the most accurate and deadly.

CONTINUOUSLY POINTED FIRE

By use of computors, enemy gunners can estimate speed, altitude and course, and have their guns continually aimed at the predicted position of a plane's flight. Each shot is carefully aimed at a point in the sky toward which the airplane is flying at the instant of firing.

To avoid continuously pointed fire, consideration should be given to the time it takes the projectile to get from the gun to the predicted position. The average AA projectile gains altitude at the rate of about 1,000 feet per second. Thus it takes 10 seconds for a projectile to climb 10,000 feet, 20 seconds to reach 20,000 feet, and an airplane should not continue its flight for any period of time longer than it takes a shell to reach its altitude. When under fire from enemy flak or when flying over an area known to be defended by heavy guns, never hold the same course and altitude for more seconds than the altitude in thousands of feet, unless actually making a bombing run.

CONTINUOUSLY POINTED FIRE

PREDICTED CONCENTRATION

BARRAGE FIRE

Enemy gunners when using continuously pointed fire must estimate where the target aircraft will be at the end of so many seconds, and their lead must be correct to within relatively few yards if the burst is to cause damage. Therefore, to avoid being hit, a formation flying at 20,000 feet in a continuous course in one direction must turn within 20 seconds. The shells will then burst along the previous heading rather than the present one. After taking a new heading the gun batteries will require approximately 10 seconds to compute their firing data. This plus the 20 seconds required for the projectile to reach 20,000 feet, makes 30 seconds that the formation can continue on its new

(*Continued on Page 59*)

Drop on Corregidor

Three Air Forces take part in an all-out air assault that enables Paratroopers and Infantry to seize "The Rock" in record time, with little loss

BY MAJ. THOMAS C. HARDMAN

AIR FORCE Overseas Staff

The lead bombardier spotted his target through a break in the clouds that hung over Manila Bay. Seconds later, a B-24 load of 500-pound bombs whistled down on "The Rock." The air blitz of Corregidor had begun.

One by one, Liberators of the 13th Air Force's 307th Bomb Group passed over cloud-obscured Cavite, made 180-degree turns over Manila's docks and came in for their bomb runs on the tiny island bastion that stands like a sentry at the entrance of the harbor.

The Libs dropped their 500-pounders from 17,000 feet, and 85 percent of them blanketed the target. Tremendous blasts tossed smoke and debris more than 3,000 feet into the air. One string of bombs found an underground dump, and the resulting explosions appeared to race along an L pattern as the earth erupted.

This strike was made shortly after noon on January 23. By the 17th of February, Corregidor was to become the most heavily bombed island per square foot of any invaded area in the Southwest Pacific.

The green light for the air blitz on "The Rock" had been flashed several days earlier in the form of an unqualified compliment to airpower. General of the Army Douglas MacArthur, commander in chief of Allied Forces in the Southwest Pacific Area, and General George C. Kenney, commanding general of the Far East Air Forces, were discussing ways and means of capturing Corregidor, held as a bloody symbol since its day of surrender back in May of 1942.

"General," remarked the FEAF commander, "Let me take Corregidor from the air."

General MacArthur hesitated but a moment and replied:

"All right, George, go to it." And the discussion ended.

The 13th's Liberators, which had gashed the jugular vein of Jap supply arteries to the south with strikes on such "out-of-reach" targets as Truk, Yap and Balikpapan, were the first of the big parade of heavies, medium and fighters to be thrown against the three and three-quarter mile long island.

Next came three veteran groups of the 5th Air Force—the 90th's Jolly Rogers, the Ken's Men of the 43rd and the 22nd's Red Raiders. These were the boys who had pasted the Japs almost daily since the 1942 days at Port Moresby.

B-24s of the 7th Air Force joined in from their bases in the Central Pacific.

(*Continued on Next Page*)

3,128 tons of bombs were dropped to soften up target areas totaling about one square mile.

← **Back to "The Rock" by air.** Paratroopers led the attack, alone held Corregidor for 40 minutes.

Skeletons that once were barracks and administrative buildings lend vivid testimony to the effectiveness of 25 days' air bombardment.

For two weeks, the heavies poured it on in rotation. Enemy antiaircraft batteries, feeble from the start, were knocked out in short order, and by the first week in February, B-24 photo-recons could circle unmolested 3,000 feet over the island.

The Japs had dug in. This called for the A-20s of the 3rd Attack Group. The Grim Reapers they are called. These low-level bombers and strafers rounded out General Kenney's team for the first half. 7th Air Force Libs in the morning, 13th Air Force B-24s at noon, 5th Air Force A-20s in the afternoon, and 5th Air Force Libs just before evening chow.

Ton by ton, the bombs rocked "The Rock." The heavies with their 500 and 1,000-pounders blew up gasoline dumps, neutralized artillery positions and dug deep into the underground labyrinth, while the A-20s skimmed in low with bombs and .50 caliber bullets to pound away at the cliffs and ridges where Jap troops were burrowing in for a stand against inevitable invasion.

Then came the fighters—P-38s, P-47s and the newly arrived P-51s—with 1,000-pound bombs shackled under each wing. Buzzing the island from every conceivable angle, they made 134 sorties and dropped 133 tons of bombs. They dropped them into cave mouths, barracks building doorways, gun pits, and, just to make sure, they fired 3,000 rounds of .50 caliber ammunition into the targets.

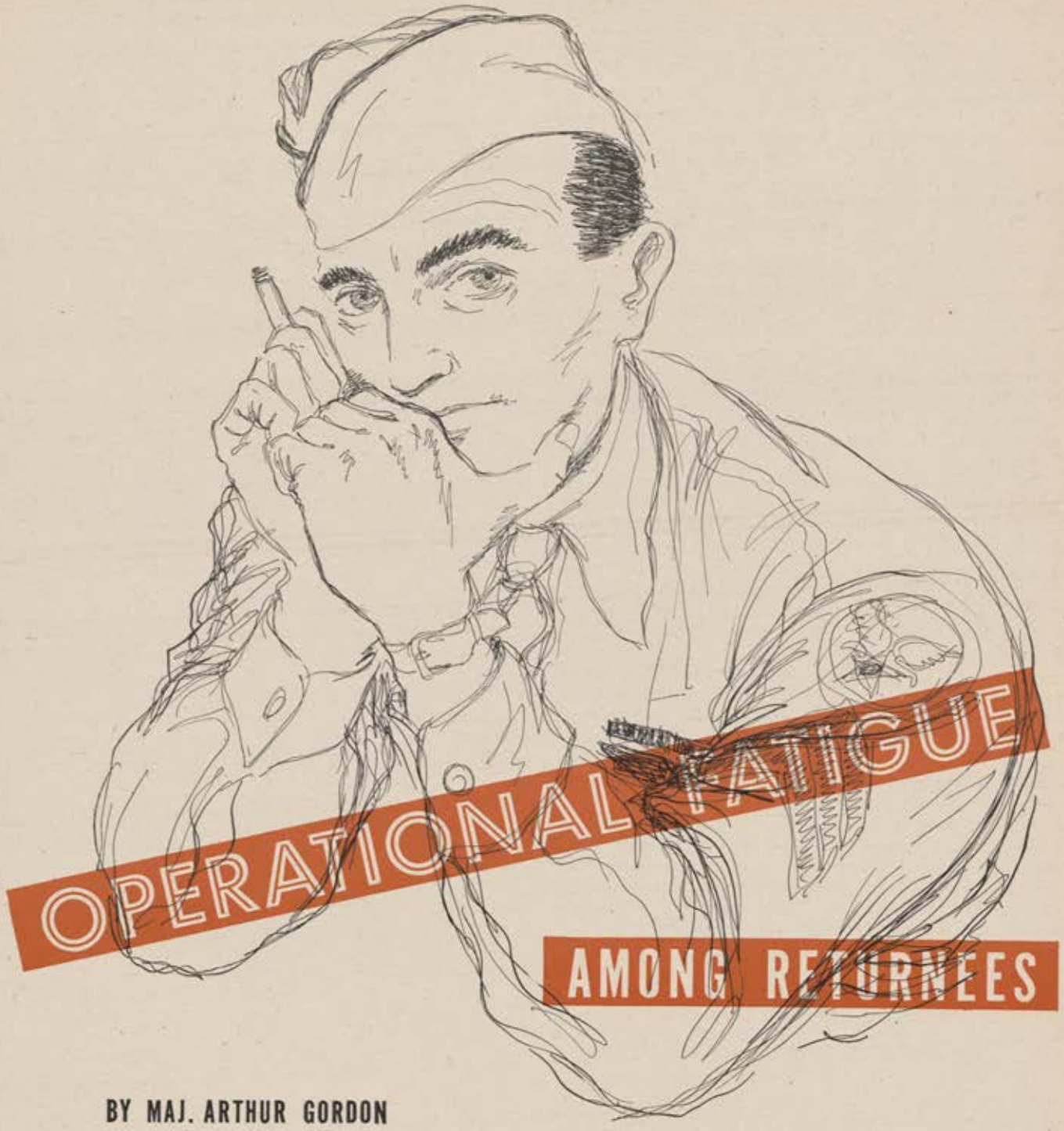
In 25 days, Corregidor had been shaken by 3,128 tons of bombs in target areas totaling little more than one square mile—a record unmatched in the Southwest Pacific. By contrast, Lae, in the two months prior to its invasion, had taken less than 1,000 tons. During the weeks preceding the Finschafen landing, Allied bombers had expended 134 tons over that target. Cape Gloucester had taken 5,000 tons of bombs, but they had fallen on an area of over nine square miles. Nearly 2,000 tons had blasted Hollandia, but here again the area covered at least 10 square miles. Wakde Island, with its two square miles, probably had been Corregidor's closest statistical competitor, absorbing almost 2,000 tons of bombs during a relatively brief bombardment period.

Now, with Corregidor's surface defenses and much of its

(*Continued on Page 57*)

A low-flying transport drops its "stick" of 8 paratroopers squarely on target—the shattered, bomb-pocked ruins of Corregidor's "Topside."

Like schools of fishes, landing craft carry infantrymen to the narrow beaches after the paratroopers had taken up positions.



OPERATIONAL FATIGUE AMONG RETURNEES

BY MAJ. ARTHUR GORDON

AIR FORCE Staff

ILLUSTRATED BY T/SGT. DON BROCKELL

Every combat flyer suffers to some degree from operational fatigue.

Here's what happens when symptoms of war neurosis appear or persist after the fighting man returns from overseas.

It's common knowledge in the AAF by this time that practically everyone who participates in combat exhibits symptoms—usually mild but sometimes severe—of a state that has been loosely termed "operational fatigue". Experience has shown that because of these symptoms a small percentage of combat crew members has to be grounded permanently in mid-tour. A larger percentage receives rest-home treatment and carries on. Most flyers finish their tours without being grounded at all.

It would seem a logical assumption that once the combat tour is ended, and the dangers which caused the emotional

stress removed, the flyer would stop showing signs of operational fatigue and pick up the threads of normal existence where he left off. But this is not always the case. A considerable number of returning combat personnel are exhibiting a delayed reaction which surprises and worries them a good deal. They think it strange that the impact of normal living should throw them off stride when they have weathered, with apparent success, the more violent adjustment from normalcy to combat. But it does, and the phenomenon is worth discussing, because once the causes are understood it does not seem so strange, and in the milder cases, at least, understanding provides a great impetus toward recovery.

In many of these cases symptoms have revealed themselves by the time the returnee has completed the 21-day leave that awaits him when he steps off the boat or plane that brought him back to the U.S.A. These symptoms vary considerably in kind and in intensity. They may include insomnia, irritability, depression, restlessness, nervousness, startle reactions, nightmares, loss of weight, aggressive behavior and others—all familiar signs of operational fatigue (see "The Conquest of Fear" in May 1944 AIR FORCE).

But why should these symptoms appear or persist when the primary cause of them—combat—has been removed?

The best place to find the answer to this question is at the Don Ce-Sar Convalescent Hospital, St. Petersburg, Fla., which has done pioneer work in the treatment of operational fatigue and is the source of the information in this article. AAF psychiatrists at the Don Ce-Sar feel that an explanation of their work in the pages of AIR FORCE, even if somewhat over-simplified, may be useful in allaying unjustified fears among flying personnel and in educating unit commanders—and even flight surgeons—in the importance of recognizing and providing competent treatment for this condition.

The condition is not limited to combat flyers. There are plenty of non-combat stresses overseas (and at home, for that matter) which may result in emotional disturbances. Poor living conditions, deep dissatisfaction with a job, poor relationship with other members of the unit, bad news from families—all these things result in emotional strain. Some individuals are much more susceptible to such stresses than others; men with unhappy childhoods, for example, are more likely to be affected than those who came from secure, happy homes.

But the majority of cases is found among combat personnel, for the obvious reason that combat imposes by far the severest emotional strain. And it is with such men that the Don Ce-Sar Hospital Staff—and consequently this article—is primarily concerned.

Let it be said to begin with that almost all the officers who enter the Don Ce-Sar—and a slightly lower percentage of enlisted men—are successfully returned to duty usually in about six weeks. And let it be stated further that absolutely no stigma is attached to any patient. Operational fatigue is as valid an affliction as measles or sinus trouble, and in most cases is as directly attributable to combat as the loss of a finger to frostbite or a foot to flak. The only difference is that operational fatigue, when cured, leaves no such unpleasant scars.

But to get back to the basic question of why there should be a "relapse" once a man has successfully completed his combat tour and returned to the States: the reason, basically, is that the man has changed—has changed under the abnormal stress of combat to the point where he is not fully prepared to face the lesser strains of modern living.

He has probably changed physiologically. In combat his body has mobilized tremendous energies to meet and repel

"... most important part of the patient's treatment consists of careful interviews with a psychiatrist."

danger. His endocrine system has worked overtime. Sometimes these energies have been expended; sometimes not. As his tour progressed, he became keyed up higher and higher. When the stress is suddenly removed, that tension does not immediately disappear. Some individuals can shift back into low gear fairly quickly; others can't.

But more important than these physical changes are the psychological ones. These may have taken place without the individual's knowledge. So long as he is a member of a group, acting as part of a unit rather than as an individual, his behavior tends to follow the group pattern. But when he comes home this unit identity is lost; he is an individual facing new problems and realities by himself. And sometimes these realities are too much for him.

Let's take a hypothetical Lt. Johnny Jones. He comes from good stock, was as "normal" as the next person before the war. He flew his tour of missions, including some rough ones, without recourse to the flight surgeon. Like everyone else, he was scared and admitted it, wanted desperately to get his tour over with and go home. And finally he did.

But when he reappears at the redistribution station after his 21-day leave with his family, he knows that he is not himself. He is irritable, given to flashes of hair-trigger temper. He is fed up with civilians. He is not sleeping well. He is restless and tense.

If he is wise, he will report these symptoms to the doctors who give him a routine examination at the redistribution station. It may be, however, that he decides not to tell, thinking (mistakenly) that they are not important, or that they will disappear. If his self-control is good—and it may be—he will probably be assigned to a duty station, and open trouble will not appear until later, when there is always the danger that his symptoms will not be recognized for what they are and he may find himself receiving disciplinary action instead of medical care.

However, let's assume that Johnny Jones tells the doctors frankly that he is off his feed. In all probability they will send him down to the Don Ce-Sar or one of the other ten AAF Convalescent Hospitals for rehabilitation. Admitted as a patient at the Don Ce-Sar, he undergoes thorough physical, psychological, psychiatric, and laboratory examinations. After a week, his particular case will be classified and treatment begun accordingly. It will probably consist of periodic discussions with a psychiatrist—described more fully later—and participation in certain group activities. It certainly will not be unpleasant. Physical surroundings are ideal, food is excellent, entertainment includes everything

from dances to deep-sea fishing trips, wives may live near the hospital,—in short, everything is done to make life as pleasant as possible for the patients without spoiling them.

It is a mistake, however, to suppose that rest or change or physical exercise alone will solve Johnny Jones' problem. The problem is emotional; he cannot 'forget' it or simply put it out of his head. It goes deeper than that.

If Johnny Jones were to ask a psychiatrist to explain the cause of his irritability and aggressive tendencies in plain English, he would probably hear something like this:

"Like everyone else who flew a complete tour of missions, you were subjected to emotional strains and stresses that at times were well-nigh unendurable. You kept going because of your pride in yourself and your unwillingness to let the unit down. But your subconscious self was not so conscientious about facing unpleasant realities as you were. It preferred to turn away from them, escape from them. It chose to regress toward the period in its experience where there was the least stress, the least tension—that is, toward your childhood, where people loved and cared for you, where nobody tried to hurt or kill you, where there were no problems, no tensions.

"The conscious you was not aware of this. You looked forward with almost frantic anticipation to the day when your tour would be over, when the danger would cease, when you could go home. The word 'home' meant everything you desired: freedom from peril and pain and the grim necessity of forcing yourself into impossible situations. That hope was what kept you going. Without it, you would have found combat too much for you.

"Well, so you got through. You came home. You came home as an individual, remember, not as a member of a team welded together by training and combat. As an individual you were hungrily looking for these gratifications, the prospect of which had sustained you through your combat tour. And what happened? You didn't get 'em.

"A man who has lost his unit—and with it some of his self-confidence—feels reassured..."

"You found, for example, that the Army still expected you to be a man and accept responsibility and do a job. You found that your family was delighted to see you and loved you very much, but your wife (if you had one) wanted you to take over the somewhat snarled bank account and your mother wanted you to make decisions regarding her insurance and your kid brother wanted guidance in his high school courses. They—naturally—expected to rely on you as they always had. You wanted to lean on them.

"What happened, in your case, when you discovered that these immature longings were not granted? What happened when gratification was denied? Child-like, you had a tantrum. You became irritable and hostile. You were mad with everybody.

"Cleverly, because it likes to save face, your ego concealed the true state of affairs from you. You said you were angry with civilians because they 'didn't know there was a war going on', or 'didn't make enough effort'. What you really meant was that they didn't make enough effort about you. Still convinced that the Utopia you pined for existed in civilian life, you blamed your unhappiness on the Army. You said you wanted to get out. You said your mother needed you. What you really meant was that you needed her.

"Other returnees show different symptoms. Some are depressed. Some have gastric disturbances. But your case is fairly typical, a case in which combat stress produces a longing for a completely tranquil, dependent existence which, in this 20th century of ours, simply does not exist."

Now, explaining his case to Johnny Jones may help, but it will not cure him overnight. He must grasp the truth emotionally as well as rationally. His ego, which has become weak, needs to be strengthened.

Participation in group activities helps. A man who has lost his unit—and with it some of his self-confidence—feels reassured as soon as he finds himself part of a team, even if it's a basketball team or a class in radio-building. Human beings are gregarious. They draw strength from associating with one another.

But the most important part of the patient's treatment consists of careful interviews with a psychiatrist. The role of the psychiatrist in these interviews, broadly speaking, is to ascertain the basic conflict in the patient's mind, to locate by questioning and insight the source of the anxiety, then hold it up to the light of reality where the patient can recognize it for what it is and deal with it accordingly.

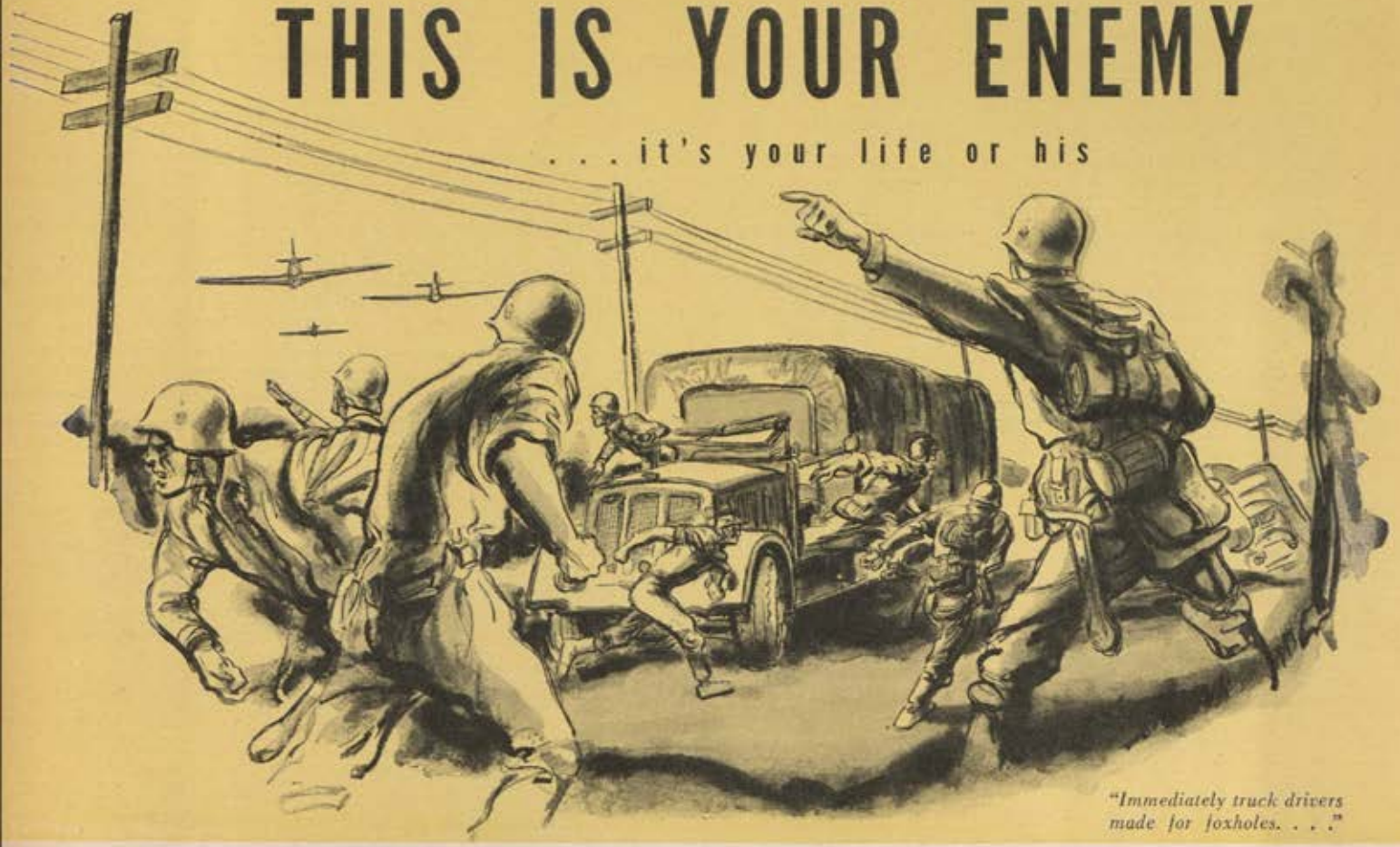
No two cases are exactly alike, but three imaginary and somewhat over-simplified case histories may serve to illustrate the basic principles. Assume that we have three returnees, X, Y, and Z. Sgt. X, a Liberator tail gunner, exhibits an abnormal degree of depression. He is brooding about something, and it does not take the psychiatrist very long to determine that Sgt. X has a deep sense of guilt. It goes back to the day that he went to the flight surgeon and got himself grounded because of a head cold, and his Liberator took off without him and did not come back. Sgt. X was terribly upset at the time. He wondered if perhaps he were not to blame. If he had not gone to the flight surgeon that day, if a new man had not been in the tail, maybe his friends would not be dead. But they were dead, and the sergeant wondered, secretly and guiltily, if perhaps he were not responsible, if perhaps he had not killed them, if perhaps he were little better than a murderer. . . .

These guilt complexes are very common—and usually respond readily to treatment. Once the incident is reconstructed, the psychiatrist can expose it to simple logic. He can point out that it would have been criminal for the

(*Continued on Page 34*)

THIS IS YOUR ENEMY

. . . it's your life or his



"Immediately truck drivers made for foxholes. . . ."

Flak, Still. Although intensity of German flak varies with the importance of the objective and cloud cover at the target, bomber crews are unanimous in reporting that it is still there. Shortage of ammunition has reduced non-visual fire unless the formations are attacking vital targets. Fire encountered during bad weather over the Rhine Valley indicates the importance attached to targets in that area. German training directives emphasize firing with the unaided eye. German skill in this operation is not surprising, considering the experience the Nazis have had. Batteries often fire without tracer and without intricate aiming devices.

In the German handbook on flak tricks there has always been a chapter on luring fighter-bombers within easy range of the guns. Pilots of the 9th Air Force noticed three trucks moving slowly back and forth along a road west of Neuss. The highway was lined with trees, and foxholes were dug at intervals of 50 feet. The fighters dived to attack. Immediately truck drivers made for foxholes, and light flak came up from positions on both sides of the road. The planes got off unscratched, despite the ordeal of fire and the unexpected hazard of a double row of high-tension wires running across the highway.

Red-Ball Routines. Twentieth Bomber Command crews have recently noticed that the Japs have refurbished their bag of older tricks. Decoy planes, which were reported in such large numbers over China early in the war, have simplified their tactics. Whereas the decoys once employed all kinds of aerobatics to distract American pilots, they now rely on simple diversionary attack. Often these diversions are used in connection with formal attack, such as the "Chow Line." This "line" usually forms on the right of the formation, carrying its attack through with diving turns to the left.

The "Chow Line" is not the only type of fighter attack nicknamed by the Superfortress crews. The 11-12-1 o'clock, high speed power-dive attack has been christened The Twelve O'clock Express. The dive usually breaks under the bombers, but occasionally the Jap fighter zooms for his getaway. Flying through the formation has become much more common recently. Reminiscent of the tags given German tactics are other nicknames giving the "true picture" of Jap attack—Sidewheeler, Tail Pecker, and Belly Button.

Because of the speed and altitude of most B-29 attacks, Jap fighters have not always been able to use cloud cover or the sun. Occasionally they have attempted to sneak through vapor trails, but they lose rate of closure in this way, and B-29 gunners can spot bandit vapor when they see it. Mathematical-minded spotters kept a check on recent sightings. They qualify their statistics by the comment that Tojos were more frequent in earlier missions and the Nick sporadic in appearance. Of all fighters sighted, here are the leading "appearances": Tojo, 30 percent; Zeke-Hamp, 19; Oscar, 16; Tony, 13; Nick, 12.

Regardless of type, Jap fighter attacks have been pressed much more closely than on earlier missions. Firing is more general, too. On a recent mission of the Superfortresses, 80 percent of the Jap fighter attacks were closed to 300 yards, and more than 80 percent of the fighters opened

fire. Over a large number of missions, the average had been only about 60 percent. Attacks continue to be largely from the front quarter, for the obvious reason that the Japs have a much faster rate of closure and a minimum deflection in this type of attack. Previous distances for opening fire were concentrated in the 500-1,000 yard range, with many fighters firing at more than 1,000 yards.

Air-to-air bombing is still part of the JAF repertoire. Although the majority of air-to-air missiles have been of the phosphorus-bomb type, crews have reported sighting "frag clusters, demolition types, incendiary clusters, towed bombs constructed to explode on contact, an array of queer, almost indescribable contraptions shaped like orange crates, pieces of pipe, flat oblong boxes, and balls and chains." As in the case of straight fighter attack, the usual air-to-air bombing approach is front-quarter. Jap pilots have shown a tendency to flip their bombs into a formation at close range instead of dropping them from high above the bomber formation.

Jet Formation. P-51 pilots who have encountered the ME262 deep inside Germany report the Nazi jaypee plane excellent at flying formation, diving, and climbing at high altitude. They are not much impressed so far by its performance in a turn or climb at low altitude. A typical formation was described as "a four-flight pattern similar to the AAF's 4-plane fighter formation." Individual aircraft in each flight were arranged with 3 leading line-abreast, and 2 or 3 in trail. The whole formation was "compact."

Correction. Back in the September issue we commented on certain characteristics of the Jap twin-engined bomber known as the "Betty."

In explaining that magnesium is used extensively in the Betty, we made this statement: "Magnesium, however, is a highly inflammable metal which is apt to burst into flames as soon as it is hit." We have since been reminded that magnesium alloy is no more dangerous than any other dural alloy and that its igniting temperature is generally the same as that of aluminum. In correcting our September statement we call your attention to a brief report on magnesium on Page 53 of this issue.

Letter of the Law. Although lecturing enemy civilians on the Geneva Convention is not one of the standard procedures for American prisoners of war, a B-17 crew member of German descent who had to bail out near Vienna used an abbreviated oration on international law effectively. Parachuting in the vicinity of the Schwechat Heinkel factory, the American came to earth at the post of a civilian guard, who forthwith began flourishing a revolver and demanding, in his loudest Viennese, that the crew member give up. During one of the wilder gestures the American knocked the guard cold. When a few seconds later he was taken into custody by German soldiers, he explained in an accent more Midwestern than Viennese, that civilians had no business threatening soldiers with fire arms. The members of the Wehrmacht agreed, and promised to have the matter "taken up." But the American wasn't satisfied until the guard had come to and been required to listen to the lecture on the rights of the military.

"During one of the wilder gestures the American knocked the guard cold."

They Haven't Given Up. Despite the tremendous number of their planes destroyed in the air and on the ground, despite the fire and explosives spilled on their production centers, the Japanese go on with their program to build—or rebuild—the JAF. More power, better armament, and other technical refinements have been noted often enough to make this determination obvious. Old planes have been improved, new types are being hurried from drawing board to quantity production. Developmental stages that once required four years have been greatly shortened. Since early 1944, monthly production increased notably up to the time of the holocausts of 1945.

"Japan has the choice of watching the destruction of her aircraft industry. . . ."

About two-thirds of Japanese aircraft production comes from two plants, the Nakajima Company and a plant larger than Willow Run, the Mitsubishi Rokuki at Nagoya. The Kawasaki plant and the Kawanishi Company at Kobe-Osaka form a third important center. These tremendous concentrations of industry increased the efficiency and

speed of aircraft production in the months before the B-29 attacks and the appearance of the carrier-based planes over Japan. Now concentration means vulnerability. Japan has the choice of watching the destruction of her aircraft industry, of dispersing the plants or putting the manufacture underground. The Government has been to great—and very loud—pains to publicize its underground aircraft facilities. To round out what comfort may remain to the Japanese, it has issued an official memorandum: "Please be at ease. Our war factories have been shifted to other areas." In equally official pronouncements, however, Koiso has admitted tremendous losses.

"Attack by Japanese ground forces was supposed to be synchronized with the jump, but the timing failed."

Meanwhile, the factories have proceeded with an accelerated program. No characteristic of the new planes promises greater improvement than the engines. In 1940, the typical Japanese aircraft engine averaged about 1,000 hp on the take-off. Engines now in combat develop about 2,000 hp. The Homare 21, for example, is a two-row, 18-cylinder, air-cooled design developing horsepower equal to that of the P-47.

Increased power in these new planes may cut range and maneuverability. Altitude may also be limited, but the speed of some of the new models is expected to top 400 mph. Safety for aircrews has been increased by more effective armor and self-sealing gas tanks. Better guns and occasional additions of 25 mm, 30 mm, 35 mm, and 40 mm cannon have made the Japanese planes a better offensive weapon. All of these advantages may well be canceled by shortage of able pilots, combat loss, and reduction of Japanese aircraft industry. But the Japanese have not quit trying.

One Man's Theory. A crack Luftwaffe pilot has set down his notions of effective German fighter tactics against American bomber formations. His main thesis is that fighter escort should be broken up before attack on a bomber formation. The result of any bomber attack, he argues, is not radically reduced by cutting a formation from say 900 to 880. Once fighters are driven off, the bombers come easy. Actual practice in the Luftwaffe has been to send out fighters at about Gruppe strength. After being vectored to the bomber stream, the fighters make independent or coordinated attack on either escort or bomber formation, according to opportunity. Very large attack-fighter formations with top cover have been generally abandoned. The change in tactics has the obvious advantage of conserving time, fuel, and pilots.

Hirohito's Paratroops. Paratroop operations by the Japanese have not been numerous. Early in the war, Menado in the Celebes, Palembang, Sumatra, and Koepang were all scenes of airborne attack. Successful operations against Timor, conducted by the crack unit No. 1 Teishin-Dan set the scene for one of the most heroic Allied stories of those months, the saga of the Guerrillas of Timor. By these early and generally profitable experiments the Japanese might have been encouraged to try more and greater paratroop operations in New Guinea. But it was not until late November, 1944, that another sizable operation was attempted. That attack was planned as part of a counter-offensive to neutralize Morotai. In the midst of planning, it was shifted to support a convoy scheduled to enter Ormoc Bay on November 28. The plan fizzled.

A more elaborate airborne attack was scheduled for December 5-6, designed to assist another convoy to unload at Ormoc December 7. Apart from the dramatic accent of the date, the main plan was to paralyze Tacoblan and Dulag briefly, and to move in on Buri, San Pablo, and Bayug for systematic occupation. With this attack, No. 1 Teishin Dan returned to the limelight. But the lights went out, and fast. About 500 paratroops transported by Topsys, with Oscar escort, went into action. Attack by Japanese ground forces was supposed to be synchronized with the jump, but the timing failed. So did the operation as a whole, thanks in large part to AAF ground units (See "Banzai at Burauen," AIR FORCE for March). To close the books, the "anniversary convoy" was smashed on December 7.

Despite these recent setbacks, Japanese plans for airborne organization are ambitious. Besides regular paratroops and airborne infantry, it is believed the Japs have set up parachute artillery, glider artillery, machine cannon, tank, engineer, signals, transport, and evacuation units—all airborne. Paratroop training in the Empire began on a large scale in 1940, under the direction of a hundred Nazi experts imported for the purpose. Between 1941 and 1944 many Japanese were trained in German paratroop schools.

Enemy Charm. Chief German interrogator of all Allied airmen is Oberstleutnant Karl Heinz Jung, head of Dulag Luft at Ober Ursel. Jung specializes in charm, not the flashy variety but the quiet, understanding sort. He can play every note on the good-fellow theme, from the very-jolly to the serious-professional. His act has been learned in wide international travels.

Married to a wealthy Peruvian, Jung has lived most of his life outside Germany. He once owned large properties in the United States. His English is better than fluent; he is up on local idioms. Acquainted with details of life and customs in all parts of England and the United States, he is an expert at casual conversation on things Allied airmen knew at home. Not the least of his talents is a keen knowledge of aviation, and he is glib at "talking shop." ☆

"Jung specializes in charm, not the flashy variety but the quiet, understanding sort."

PIXILATED P-51

Someone in the Wright Field photo lab slipped this Mustang a mickey in order to illustrate aerodynamic effects of violent maneuvers on aircraft. Take it easy on the stick and throttle, don't nose over too quickly or loop too tightly—pity the poor, defenseless plane.

Tight outside loop makes rhubarb out of this Mustang's wings and it now has a slight tendency to succumb to wingtip flapping.

This swayback is the victim of a pilot who yanked back too hard on his stick in a dive pull-out, violently straining his longerons.

Aerodynamicists predict this result if you abruptly cut the throttle and change the prop to low pitch in middle of high-speed run.

Jam on full throttle, throw the prop into high pitch, and your non-elastic P-51 may go out for a nice, long stretch like this.

M/Sgt. Charles W. Woolsey, a Yale graduate, is directly charged with more than 70 projects. He sits among some oversized mock-ups of flight instruments he helped engineer to simplify instruction.

Research from

BY S/SGT. DOUGLAS J. INGELLS

AIR FORCE *Staff*

PHOTOGRAPHS BY T/SGT. CARL GIFFORD

Jim Graham is an enlisted man. He's responsible for installing the first booster pump systems in the fuel tanks of B-17s which lifted their ceilings by at least 10,000 feet. His idea for a new method to cool the Wright R-3350 engine that powers the B-29s turned a good engine into a top performer. In the winter of 1942-43, he was in Alaska helping to lick some of the winterization problems for our aircraft. In 1943-44, he was in India and China looking into the kinks in the performance of the Superforts.

Master Sergeant Graham is one of the many enlisted men assigned to the Engineering Division, Air Technical Service Command, Wright Field. Fifty percent of the new equipment released last year by the Equipment Laboratory resulted from projects handled by these enlisted men. Experimental purchase orders for these GI projects amounted to millions of dollars.

Twenty-five hundred enlisted men are on duty at the Engineering Division, representing the finest pool of professional talent from every walk of civilian and Army life that ever has been gathered together to serve one organization. They range from buck privates to master sergeants, and they have played an important part in the greatest engineering job of all time—to design, develop, and deliver the best possible fighting planes and auxiliary equipment to the men in the AAF.

Down in the laboratories and up in the planes, they do a thousand different tasks that nobody ever hears about. They try and fail, and try again until they succeed. Some have died during grueling tests to prove a new piece of equipment that they helped father into existence. Some have been overseas to witness first-hand the lack of this or that device, and have come back to the States to do something about it. Others have helped perfect new gadgets or weapons and have taken them into combat to make sure they work effectively.

In one laboratory alone there are more than 70 enlisted men engaged in engineering research. Of these, 40 hold engineering degrees — including five masters — from the finest universities in the nation. A former president of a large plastics concern is perfecting a new laminate for all-glass airplanes; an India-born private makes gadgets for the wind tunnels, and scores of other men of all ranks contribute to the job of making the airplane a safer, more efficient fighting weapon. They have a free run to conceive and create, design and develop, predict and perfect.

Consider Master Sergeant Graham, for example. He is no engineer by degree. His knowledge came the hard way —by guess and by feel. But when it comes to engines or fuel systems, his word is accepted. 1st Lt. R. C. Hock, his superior officer, says, "I'd trust Graham's guess sooner than I would my own engineering ability on most things."

Often, the sergeant cannot be found at Wright Field. He's out at Seattle or Wichita or maybe down at Marietta, Ga., ironing out some problem for the men who build the B-29s. When the first YB-29 came out, something went wrong with the brakes; it wouldn't taxi properly. Plant

These AAF enlisted men—engineers, scientists, craftsmen—develop and perfect much that is new in the air

the RANKS

engineers could not find the trouble. They sent for Graham, who soon spotted a busted wheel diaphragm, fixed it, and had the plane rolling.

Graham was the first EM assigned to the 29s in the Spring of 1943. He was crew chief and engineer on the initial test flight of the XB-29 at Seattle and he has been with the big babies ever since. Today he has a total of more than 800 hours in the Superforts.

It was during the service test program that he suggested his idea for cooling the engines. He did it because for 13 consecutive flights the plane in which he was flying had to turn back when the engines quit or got too hot. He suggested that the top cowl flaps—which were flush with the engine cowling—be opened about two inches. The result was a 15 to 20-degree drop in temperature. "It was just enough of an idea," says Graham modestly, "to get the smart engineers to work on it." Final adaptation is an electrically operated flap and new baffling, now part of every B-29 engine.

Then there is Pvt. John Albriton. Aerodynamicists had a problem of developing an instrument for measuring the fluctuations of airflow over an airplane's surface at high speeds. There was an instrument in design stage for 18 months, but nobody seemed able to build the device and make it work.

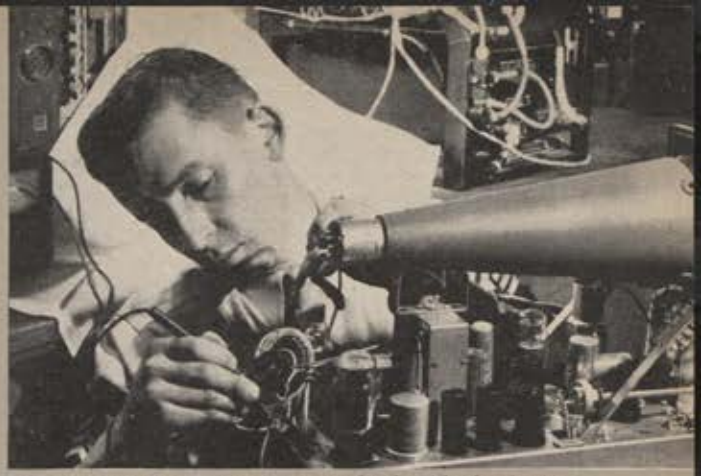
Albriton set out with tiny tools and a delicate touch and produced the required article that made the instrument work. With a series of discs attached to the surface of a model in a wind tunnel or on a plane in flight, engineers can now obtain a second-by-second record of airflow, whereas previously they had to rely on spasmodic reports. Albriton's nimble fingers also have made the instrument in a miniature version—no larger than a pin head—so that it can be swallowed like a pill to record stomach pressure in a human being.

Whenever manufacturers' representatives and Army men discuss wind tunnel tests and developments, Pvt. Philip Antonatos sits in on the conferences. His word is the "yes" or the "no" on a piece of new test equipment designed for the field's wind tunnels. When a new model comes in for a test he gives it the once over with a slide-rule and microscope to determine whether or not it will withstand high-speed velocities.

One of his devices is a Mach Number meter which makes possible measuring exact mach numbers at high speeds. He also is engaged in designing a new "scavenging system" which takes away jet gases. Applied to the high-altitude wind-tunnel it will permit testing of jet engines.

Other G-Innovations from the design and structural experts include: A force recorder which tells how many pounds of energy are required from a pilot on the control stick to lift a glider off the ground. Two sergeants worked out that gadget and on a similar device which measures the tow-pull force needed to tow a glider. A private is responsible

(Continued on Page 61)



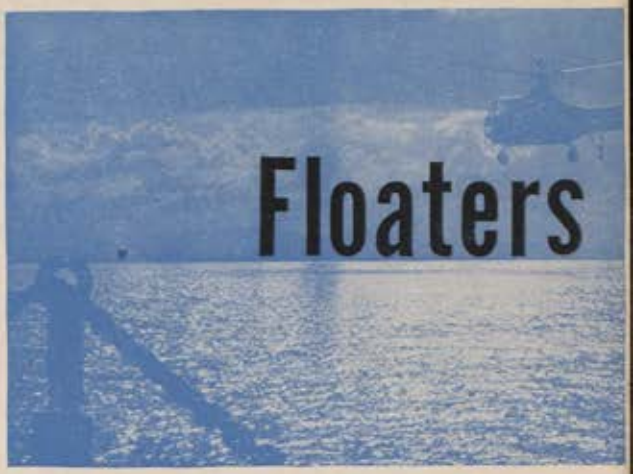
S/Sgt. Paul A. Millerwise is credited with developing a "radar car" for testing various radar devices on the ground.

An auto designer in civilian life, M/Sgt. Alex Tremulis here visualizes an idea for launching fighters by skyrocket.

Inspecting exact-scale model of an air-rescue lifeboat he detailed as asst. project engineer, is S/Sgt. George Brown.

A pioneer in the B-29 program, M/Sgt. Jim Graham points to cowl flaps he worked on to make engines more reliable.

AAF floating aircraft repair units provide emergency maintenance for B-29s in the Pacific



Floaters

The sergeant on Saipan was unhappy. "A B-29 raid on Tokyo is scheduled for tomorrow morning," he said. "We have 50 propeller governor heads to repair. We can't do it, even if we work all night. They'll have to call off the mission."

Capt. Llewellyn N. Duffield, Jr., walked out to the strip. "C'mon," he said. "Each of you guys pick up a governor head and follow me. We're going wading."

He led the men down to the water. A whispered conversation was held with a Navy man, who then started blinking a signal light. "What are you fellows doing," the sergeant inquired, "inviting the Japs to pay us a social visit?" Duffield assured the sergeant that he knew what he was doing and continued his discussion with the Navy signalman. Shortly, a boat pulled up beside them. "In," Duffield grunted. "You, too." He pointed to the sergeant. "In."

The men rode out to a Liberty ship which was anchored about a mile and a half offshore. After they had scrambled aboard, Duffield explained to the sergeant. "This," he said, "is a floating aircraft repair unit. It has everything necessary for fourth echelon maintenance work. Its job is to move along with our invasions and provide repair facilities for aircraft until an air depot is set up on land. I'm the engineering chief. Right now, we're going to help you out."

The necessary repairs were made by the technicians on the Liberty ship and the governor heads were installed in time for the Tokyo take-off the following morning.

Thus, Saipan was introduced to a sea-borne Air Force installation known officially as an Aircraft Repair Unit (Floating). Actually, it is called a "floater."

The purpose of the floaters is to speed up maintenance operations. Air action cannot wait until complete repair facilities are established. Sometimes it cannot even wait for the men on the floaters to reach shore in small boats and travel the necessary distance to the airfield where repairs are needed. To provide for this, and to speed operations to the highest possible point, a tiny flight deck was installed on the converted Liberty ships that are used for this purpose. Two, and sometimes three, helicopters are standard equipment on all floaters and serve as transportation

Personnel, tools, and spare parts are flown from the Liberty ships to B-29 airfields by R-4B helicopter to speed maintenance and repairs.

for key personnel, tools and small parts. The floater also carries jeeps, ducks and 30-foot workboats.

Suppose a B-29 remote control turret and computer were damaged by a 20 mm shell. This is what happens:

The engineering officer of the floater flies to the Superfort base by helicopter and inspects the damaged turret to determine the nature of the required repairs. Meanwhile, a jeep with a trailer is brought ashore and driven to the flight strip. The turret is loaded on the jeep, transferred to a small boat, and brought out to the Liberty ship. There, a winch hoists the 435-pound mechanism and lowers it through a hatch into the ship's turret shop.

Once aboard, the turret is dismantled and the damaged parts are assigned to the appropriate repair shops. To the sheet metal, ordnance, welding and electrical shops, respectively, go the turret dome, the .50-caliber machine guns, the gun-supporting cradle and the gun-elevating motor. Weather-stripping is applied by fuel-cell specialists, necessary cadmium plating is done in the electro-plating shop, a magniflux inspection of the elevation trunnion bearing is made in the propeller shop and the gunsight aiming-point camera is checked in the photo section. From plans made in the drafting section, the machine shop men construct a contour-follower crank-arm. Computer vacuum tubes are tested in the radio section, and the computer, itself, in the turret shop.

With tasks thus apportioned, the entire job can be completed within 48 hours.

In one actual case, a floater was the principal source of providing breathing oxygen for the aircrews at a B-29 base. On Saipan, captured Japanese oxygen-making machinery turned out 15 cylinders daily, but this was hardly sufficient. A floater relieved the situation by making oxygen on a 24-hour basis for the Superfort base.

Designed to operate under combat conditions, the floaters are protected by twelve 20 mm antiaircraft guns, two 40 mm antiaircraft guns, one 3-inch all purpose gun, and one 5-inch all purpose gun.

Early in November, 1944, at Saipan, one floater had occasion to use its armament. The Japs attacked the Superfort base in strength. Personnel on the floater watched the battle with great interest. Suddenly, a Jap Betty came off the island, directly at the Liberty ship. The gunners hit it when it was about 700 yards away, and watched it crash into the ocean.

The men on the floaters have had their share of adventure. One of the most dramatic experiences was seen from the deck of the Liberty ship Daniel F. Garrett. During the trip from the States to Saipan, it was the practice of the helicopter pilots to test-hop their planes in order to

All Aircraft Repair Units (Floating) are equipped with at least two helicopters which provide liaison service between ship and shore.

"Floaters" can handle fourth echelon repair. Here, a prop blade is installed.

Machine guns from a B-29 are transferred for cleaning and overhaul.

Cylinders of breathing oxygen move from the "floater" to a "duck."

sharpen up their landing technique. On November 1, 1944, 2nd Lt. Jack L. Zimmerman climbed into his R-4B helicopter with Pvt. William K. Troche as passenger. Troche, assigned to the dope and fabric department, had made some covers for the helicopter, and Zimmerman was taking him up as a reward for his work.

The helicopter took off downwind from its 72-foot by 40-foot deck, got caught in a downdraft about 20 feet off the port side of the ship, and crashed into the ocean. Zimmerman kicked the rudder so that the main rotor hit the water and stopped spinning. Then he said in a very matter-of-fact tone, "Let's get out."

He loosened his safety belt and got into the water. But he couldn't find his passenger. He stuck his head into the helicopter's cockpit, and inquired calmly, "What's the matter?" Troche replied that he was stuck, so Zimmerman unfastened his safety belt, and got him out. But when they reached the top, Troche's Mae West wouldn't work, so Zimmerman held him above the water.

Meanwhile, the ship had gone about a mile past the two men. A lifeboat was launched, but the men could not be found in the rough seas. Crewmen aboard the ship attached rotor blades to the second helicopter and got it off the deck within nine minutes after the alarm had sounded—something of a record. 2nd Lt. Robert Boyce piloted the rescue helicopter and had no difficulty finding the men. He hovered over the spot where they were floundering, and the lifeboat picked them up.

According to Edward Lukas, Sikorsky representative who was aboard, this was the first time that a helicopter had ever gone down at sea. It floated for about five minutes before it sank.

The history of the floaters is uncertain. The idea is said to have originated early in the war in the Mediterranean theater. There, an air depot group commander put his outfit aboard a ship to move it to a forward base. He got the idea that the repair facilities permanently emplaced on shipboard might be useful in a fluid tactical situation. The plan was thrashed out in Tunisian staff meetings, Italian operations offices, and at Washington headquarters. Finally, the Air Technical Service Command, the AAF's engineering, procurement, supply and maintenance agency, got the job of turning the dream into a steel-clad ocean-going reality.

There are about 400 AAF personnel aboard each floater. They wear the blue dungarees and squared white hats of the Navy, and are authorized to wear the shoulder patch of the 20th Air Force. Caught between sea duty and allegiance to the Air Forces, they refer to themselves as "sailjers."

Floating aircraft repair units were organized and specialized training was provided at Bates Field, Ala., the Mobile ATSC Headquarters, Brookley Field, Ala., and the ATSC marine training school, Fairhope, Ala. When AAF personnel first boarded their boats, they didn't know their aft from the forehead, but now they are sea-going veterans.

Merchant seamen under the supervision of the Army Transportation Corps actually sail the vessels, and the guns are manned by Army gunners and Naval Armed Guard Service personnel. The floaters are under the direction of the Army Air Forces Pacific Ocean Areas, Maj. Gen. Willis H. Hale, commanding. ☆

They Map the World

Aerial photographers and ground "geodet" parties of the 311th Photo Wing work hand in hand to produce AAF's aeronautical charts

Geodets use an equiangulator to get their longitude and latitude.

BY HERBERT RINGOLD
AIR FORCE *Staff*

If you want to know just how global the AAF is, ask the men of the 311th Photographic Wing, whose job it is to gather data and do the aerial photography for the millions of aeronautical charts needed by our globe-girdling airmen.

They will tell you that the land area of the earth's surface comprises 58,000,000 square miles; that only about seven percent of the world had been adequately mapped before the war; that one squadron alone of the 311th is credited with photographing 8,000,000 square miles in less than a year.

If it were only a matter of aerial photography, their job still would be a big one. But it isn't that simple. A series of aerial photographs alone, taken over a large territory, will not produce a map adequate for aerial navigation. Such pictures are distorted in scale, and, before the photographs are worked by the trimetrigon system of compilation and control is established, they lack compass directions, elevation measurements and latitude and longitude grid lines.

To secure pertinent information, it is necessary to send ground parties to establish a network of control stations at intervals of approximately 50 miles. They determine the latitude and longitude and the approximate elevation of

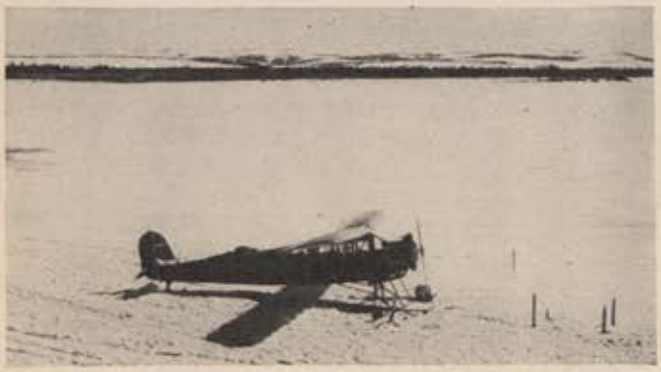
Control stations, which compile data used by the AAF in drafting aeronautical charts, are indicated by circled dots in these aerial views of wild areas of Alaska (above) and South America (below)

each station. This data plus the aerial photographs make possible the production of the pilotage charts necessary to route our global air traffic over the shortest and safest routes.

Ground work for aeronautical charting is the job of geodetic control parties and one of the many assignments of the 311th Photographic Wing, commanded by Col. Karl L. Polifka.

The "geodets" have operated in Alaska, Canada, Newfoundland, Iceland, Mexico, South America, Africa, India, Arabia and China. Together with their aerial photographic counterparts, they have provided data for aeronautical charts used on practically every Air Transport Command route in the world. In addition, they have established checkpoints and provided control for charts of remote areas over which the planes of the global 20th Air Force may have occasion to fly.

A geodetic control station may be a house, an unusual rock formation, a bridge, a bend in a river, or anything that can be identified on the photographs. The establishment of control stations and the aerial photography need not be done at the same time. In China, ground parties did their work first and the photography followed. In parts of South America, aerial reconnaissance preceded the establishment of control stations. The findings of both groups are coordi-



Ski-fitted liaison plane reached this lonely station at Kiana, Alaska.

nated by the Aeronautical Charts Service, an AAF organization which produces the final charts.

To carry out the aerial part of the mission, "flight strips" are flown. It is like mowing a lawn from 20,000 feet. Aircraft equipped with trimetrigon cameras fly over a strip of land; the three cameras click simultaneously about every three miles, and an area 20 miles in width is photographed. Usually, a few planes will "mow the lawn" together; on occasion, one plane will do the job, flying parallel, back and forth, until the assignment is completed.

The geodets, however, consider the aerial photography phase routine. Their ground parties are the ones who come back with colorful stories.

Take the case of Capt. John Meyer, for example. In 1942, he and Sgt. Richard Johnson were assigned to establish control stations in certain unexplored areas of Alaska. They set out from Fairbanks in a Travelair plane, a single-engine cabin-job equipped with skis. It was piloted by Sam White, an old bush flyer who knew as much about that country as anyone.

They went about 100 miles up into the Yukon country and landed on a frozen river. Meyer and Johnson had to jump out of the plane before it stopped and cut green boughs from the trees to put under the plane so that it wouldn't freeze to the ice. The temperature was 55° below zero.

To determine latitude and longitude, an equiangulator is used to observe the stars. When Meyer began his observations, he found that the mercury in the equiangulator had frozen and his equipment was temporarily useless. Furthermore, his eyelids froze to the instrument. He had to wait until the temperature rose.

Early the next night, the temperature went up. But by the time Meyer had arranged his equipment, the stars were obscured by clouds. Determined to get a reading, however, he arose every hour during the night until, at 0400, he finally succeeded.

Some months later, Meyer was working in the 135°-heat of central Africa. There, he had the unenviable job of flying around in a C-47 and picking landing places where there weren't any.

He was in command of a geodetic control party which was establishing stations in the Sudan. In order to spot these stations approximately 50 miles from each other, Captain Meyer and his party had to land in given areas, no matter what the terrain. They just flew along, buzzed a likely looking landing field and came down, for better or worse.

"We spent most of our time worrying," says Meyer. "Would the ground be solid? Would we blow a tire? We were getting into areas where no planes had ever landed before. One day, we put our C-47 down gently and it sank in sand up to its hubcaps. We got another plane from Cairo to bring a jeep which pulled us out."

Geodetic control parties have used almost every mode of transportation known to mankind in order to reach their destinations, including cargo planes, single-engine puddle-jumpers equipped with skis, wheels, and pontoons; coast guard cutters, Eskimo skin-boats, dog teams, caterpillar tractors, oxcarts, trucks of all types, pack mules, yaks, sail-boats, ferry boats, paddle-wheel steamers, camels, canoes and even sedan chairs.

A geodetic control party, composed of Lt. John Partanen, S/Sgt. Clyde Foushee, Dr. Robert Brown and Floyd Larsen, American missionaries, and Chinese Army escorts, traveled by yak caravan for 130 days from Kunming, China, to a B-29 airbase some 800 miles away. On their 99th day out, they were caught in the Chinese equivalent of a Hatfield and McCoy mountain feud and attacked by bandits. Four bandits were killed, but the Americans escaped uninjured.

In order to operate on flexible assignments which may entail renting or purchasing means of transportation, paying ransom to bandits or winning the friendship of native tribesmen, squadrons of the 311th are often issued large sums of money. Maj. Kenneth Johnson was armed with $80,000 to complete a mission in Canada. He accounted for all of it and got a 56-cent credit. Lt. Horace Harned had $15,000 with him in China when he was held up by bandits who demanded ransom. He put his hand into another pocket, came up with six cents and the brigands were satisfied. S/Sgt. Paavola also was waylaid by Chinese bandits who wanted 200 Chinese dollars as ransom. He protected Uncle Sam's money by talking the outlaws into accepting 40 Chinese dollars—about 50 cents in United States currency.

Men of the 311th have also completed general reconnaissance work for the 11th and 20th Air Forces. The first aerial reconnaissance of Tokyo was made by a B-29 assigned to the 311th Photographic Wing. Operating from Saipan, the plane, piloted by Capt. Ralph D. Steakley, made the 3,370-mile round-trip flight on November 1, 1944. Bomb-damage assessment photographs of attacked Japanese targets are also part of the wing's work.

Under normal circumstances, most photographic reconnaissance is made by specially-equipped P-38s. But when

(*Continued on Page 60*)

for service . . .

Fruit salad is on the menu, but check your authority for wearing theater ribbons, service ribbons and battle stars

ILLUSTRATED BY CPL. MILTON J. WYNNE

The scope, duration and multiple operations of the current war have resulted in the creation of a greater number of service awards for United States military personnel than were authorized in any previous conflict in the nation's history.

Vari-colored ribbons, gold cloth bars and miniature bronze and silver service stars and bronze arrowheads have been established during the past three and one-half years to denote where, when and how long an individual has served and to indicate the campaigns, battles or engagements in which he has participated.

These insignia, plus the earlier-authorized stripe or "hash mark" signifying three years' active federal service by an enlisted man, may be seen on the back cover of this issue of AIR FORCE.

There are three ribbons for service in theaters of operations—one for the European-African-Middle Eastern theater, one for the Asiatic-Pacific theater and one for the American theater for service outside the U. S. continental limits. In addition, there is a ribbon for those who began active federal service during the prewar emergency period, and two others for action in the defense or liberation of the Philippines. Ribbons are worn above the left breast pocket.

Participating as a member of a unit in a combat operation, considered by either the War Department or a theater commander to be of major importance, or fulfilling more than one optional requirement for certain ribbons, entitles a man to a bronze service star to be affixed to the appropriate ribbon. A silver service star is worn in lieu of five bronze service stars.

The newest service insigne is the bronze arrowhead, also attached to the pertinent ribbon. It may be gained by landing by parachute or glider in enemy-held territory as an assigned or attached member of an organization carrying out a tactical mission, or by taking part in an initial assault landing on a hostile shore.

Each of the gold cloth bars, worn on the lower left sleeve above the service stripe or stripes, represents six full months' service, not necessarily continuous, outside the continental limits of the United States. Time involved is figured from date of departure from the United States to date of return.

Eligibility requirements for the theater ribbons have been changed from time to time as the war has progressed. Following is a digest based on regulations and general orders covering the subject of service awards.

The **European-African-Middle Eastern Theater** ribbon or the **Asiatic-Pacific Theater** ribbon is worn by personnel who have served in an applicable area under permanent orders for any period since December 7, 1941, but qualifications for those under temporary orders have twice been amended. From December 7, 1941 to July 12, 1943, temporary duty, regardless of length, was sufficient. Since July 13, 1943, a person can establish eligibility by being awarded a decoration for combat in the theater, or by serving more than 30 consecutive days in the theater, or, since November 23, 1943, by serving a total of 60 non-consecutive days in the theater.

The **American Theater** ribbon was authorized for personnel who have served in the pertinent region, outside the United States. Requirements have varied as follows:

1. Service under official orders for any length of time, except when passing through the area en route to another theater of operations, from December 7, 1941 to March 7, 1943.
2. Service under official orders for any length of time, provided the individual concerned was not in the theater merely as a passenger en route to another theater or on a training flight, trip or voyage or on maneuvers, from March 8, 1943 to July 12, 1943.
3. Arrival under permanent orders at a place of duty in the theater, or 30 days' consecutive service while assigned permanently to duty as a member of a crew of a vessel sailing ocean waters in the area or as a member of the

operating crew of an airplane making regular and frequent trips over ocean waters in the area, since July 13, 1943. (A ground assignment in the United States in a squadron, whose personnel made such flights, is not sufficient for eligibility.)

4. Temporary duty of more than 30 consecutive days or a total of 60 non-consecutive days in the theater since November 23, 1943.

The **American Defense** ribbon may be worn by those who entered active federal service between September 8, 1939 and December 7, 1941, for a period of not less than 12 months. An individual who served outside the United States at any time during that period may affix a bronze service star to his ribbon.

Theater of Operations and American Defense medals have been authorized, but they will not be manufactured until after the war's conclusion.

Eligible to wear the **Philippines Defense** ribbon are those who fulfilled one of the following conditions:

1. Service under enemy fire in or over Philippine territory or waters, from December 8, 1941 to June 15, 1942.
2. Duty in Philippine territory or waters for 30 days between December 8, 1941 and June 15, 1942.

The **Philippines Liberation** ribbon is authorized for personnel who meet one of the following conditions:

1. Participation in the initial landing operations on Leyte and adjoining islands from October 17, 1944 to October 20, 1944, or presence on a ship in Philippine waters or service as a crew member of an airplane which flew over Philippine territory, from October 17, 1944 to October 20, 1944.
2. Service under enemy fire at any time during the campaign.
3. Service in the Philippines or on ships in Philippine waters for 30 days from October 17, 1944 to a date to be announced later.

Relative to the last two listed ribbons, Philippine waters are defined as those within 50 miles of any of the islands comprising the Philippines. A person meeting two of the provisions for either ribbon is entitled to wear a bronze star on his ribbon. One who meets all three provisions for the Philippines Liberation ribbon is entitled to wear two such stars.

Although authority for wearing

most of the stars for campaigns, battles and engagements is contained in War Department regulations and circulars, others may be authorized by a theater commander if he believes a battle within a campaign or an engagement within a battle is worthy of such recognition.

In the fall of 1943, for instance, the air war over Europe was officially designated "Air Offensive, Europe," and the War Department authorized participating personnel to wear a star on their European-African-Middle Eastern Theater ribbons. Yet the theater commander decided that the Ploesti air attack of August 1, 1943 was important enough to be classed as a major battle in itself, and he authorized those who flew on that mission to wear a battle star for that duty alone. If they participated in other missions as part of "Air Offensive, Europe," they became eligible to wear another star.

Operations which had been designated, up to March 14, 1945, in War Department general orders as campaigns, battles or engagements entitling participants to wear a bronze star on the appropriate ribbon, follow, with respective combat zones and time limitations:

AIR OFFENSIVE, EUROPE—European Theater of Operations, excluding

the land areas of the United Kingdom and Iceland, from July 4, 1942 to June 5, 1944.

AIR OFFENSIVE, JAPAN — Hokkaido, Honshu, Shikoku, Kyushu, the enemy-owned portion of Karufuto, and the Kurile, Bonin and Ryukyu islands, including the immediately adjacent waters, from April 17, 1942 to a date to be announced later.

ALEUTIAN ISLANDS—Area bounded by 165° west and 170° east longitude and by 50° and 55° north latitude, from June 3, 1942 to August 24, 1943.

ALGERIA-FRENCH MOROCCO—Algeria, French Morocco and adjacent waters, from November 8, 1942 to November 11, 1942.

ANTI-SUBMARINE (for operations not incidental to a designated campaign or battle for which the unit receives credit otherwise) — All theaters of operations and defense commands, from December 7, 1941 to a date to be announced later.

BISMARCK ARCHIPELAGO — Bismarck Archipelago and adjacent waters, from December 15, 1943 to November 27, 1944.*

BURMA, 1942—Burma, from Decem-

ber 7, 1941 to May 26, 1942.

CENTRAL PACIFIC — The Gilbert Islands, Nauru and the portion of the Central Pacific area lying west of the 180th meridian, from December 7, 1941 to December 6, 1943; the Hawaiian Islands, December 7, 1941, only, and Midway Island, from June 3, 1942 to June 6, 1942.

CHINA—Enemy-held portions of China and contiguous countries, plus a zone 50 miles wide extending into territory held by Allied forces, from July 4, 1942 to a date to be announced later.

EAST INDIES—The Southwest Pacific area, excluding the Philippine Islands and the portion of Australia south of 21° south latitude, from January 1, 1942 to July 22, 1942.

EGYPT-LIBYA—Portions of Egypt and Libya and adjacent waters, west of 30° east longitude, from June 11, 1942 to November 6, 1942, and west of 25° east longitude, from November 7, 1942 to February 12, 1943.

GUADALCANAL—Solomon Islands, Bismarck Archipelago and adjacent waters, from August 7, 1942 to February 21, 1943.

GERMANY—Portions of France, Belgium, the Netherlands, Luxembourg and Germany, east of a line extending from the North Sea along the Franco-Belgian border to 4° east longitude, thence south along that meridian to 47° latitude, thence east along that parallel to 5° east longitude and thence south along that meridian to the Mediterranean coast, from September 15, 1944 to a date to be announced.

INDIA-BURMA — Portions of India, Burma, enemy-held territory and adjacent waters, beyond a line extending from the Assam-Thibet border at 95° 45′ east longitude, due south to 27° 32′ north latitude, thence due west to the Sadiya branch of the Sadiya-Dibrugarh Railway (exclusive), thence southwest along the railway to Tinsukia (exclusive), thence south along the Bengal and Assam Railway to Namrup (exclusive), and thence southwestward through Mokeuchung, Kohima, Imphal and Aijal to Chittagong (all-inclusive), from

April 2, 1942 to a date to be announced later.

MANDATED ISLANDS—The portion of the Central Pacific area west of the 180th meridian, excluding the Gilbert Islands, from December 7, 1943 for air operations and from January 31, 1944 for ground operations, to a date to be announced later.

NAPLES-FOGGIA—Italy (excluding Sicily and Sardinia), Corsica and adjacent waters, from August 18, 1943 for air operations and from September 9, 1943 for ground operations, to a date to be announced.

NEW GUINEA — 1 — The Southwest Pacific area, excluding the Philippines and the portion of Australia south of 21° south latitude and east of 140° east longitude, from January 24, 1943 to December 14, 1943.

2—The Southwest Pacific area, excluding the Philippines, the above-described portion of Australia, the Bismarck Archipelago and the latter's adjacent waters, from December 15, 1943 to September 30, 1944.

3—The Southwest Pacific area, excluding the Philippines, all of Australia, the Bismarck Archipelago and its adjacent waters and the portion of New Guinea south and east of Madang, from October 1, 1944 to December 31, 1944.*

NORMANDY — European Theater of Operations, excluding the land areas of the United Kingdom and Iceland, from June 6, 1944 to a date to be announced later.

NORTHERN FRANCE—European Theater of Operations, excluding the land areas of the United Kingdom and Iceland, from July 25, 1944 to September 14, 1944.*

NORTHERN SOLOMONS—1—Solomon Islands north and west of Russell Islands, the Bismarck Archipelago and adjacent waters, from February 22, 1943 to December 14, 1943.

2—Solomon Islands, north and west of Russell Islands, and adjacent waters, from December 15, 1943 to September 30, 1944.

3—Bougainville Island and adjacent waters, from October 1, 1944 to November 31, 1944.*

PAPUA—The Southwest Pacific area, excluding the Philippines and the portion of Australia south of 21° south latitude and east of 140° east longitude, from July 23, 1942 to January 23, 1943.

PHILIPPINE ISLANDS — Philippine Islands and waters within 50 miles, from December 7, 1941 to May 10, 1942.

PHILIPPINE LIBERATION—Philippine Islands and adjacent waters, from October 17, 1944 to a date to be announced later.

ROME-ARNO—1—Italy (excluding Sicily and Sardinia), Corsica and adjacent waters, from January 22, 1944 to August 15, 1944.

2—The portion of the Italian mainland north of 42° north latitude and adjacent waters, from August 16, 1944 to a date to be announced later.

SICILY—Sicily and adjacent waters, from May 14, 1943 to August 17, 1943, for air operations, and from July 9, 1943 to August 17, 1943, for ground operations.

SOUTHERN FRANCE — Portions of France (excluding Corsica), occupied by forces assigned to the North African Theater of Operations, from August 15, 1944 to September 14, 1944. (Waters adjacent to the described portions of France are included.)

TUNISIA—Portions of Tunisia and Algeria, east of a line extending from north to south through Constantine, and adjacent waters, from November 8, 1942 to May 13, 1943, for air operations, and from November 17, 1943 to May 13, 1943, for ground operations.

*—Theater commander may award stars to individuals who actually engaged the enemy after the final date listed.

Before a man leaves a theater of operations he should make certain that his eligibility to an award or awards is noted in his service record. On this or any other matters concerning service awards, he should consult his squadron adjutant. ☆

RHINELAND RENDEZVOUS

(Continued from Page 6)

chine gun fire subsided somewhat and I heard somebody approaching from the rear. While I was debating whether to emerge and surrender, someone shouted in English. I crawled out from behind the planks yelling "Thunder" as loudly as I could. This was the pass word up to 1200. For good measure, I threw in "Hither," the pass word for the afternoon. Two British paratroopers peered cautiously around the side of the shed. They motioned for me to come out of the door and they kept me covered with their tommy guns while I told them how I got here.

The two troopers took me over to their sergeant who appeared satisfied I wasn't a German. He told me his squad was preparing to capture the railroad station of the village of Hamminkeln. The station was about 200 yards up the track.

"You can come along with us," he said. One of his troopers gave me a German pistol and a pocketful of ammunition. "Here you are, mate," he said. "You may need them."

Single file we wormed our way up the tracks, keeping close to a string of freight cars, ducking behind the steel wheels whenever somebody let go at us from the wood. We reached the station without firing a shot. A quick search of the cellar flushed out a dozen German soldiers. A farm house across the road was demolished. One of the Germans said a glider had crashed into it. A number of bodies were lying in the farmyard and a little farther down the road a dead British pilot lay sprawled in the wreckage of his fighter plane.

In a few minutes, other squads of British paratroops closed in from various directions and by 1100 the station had been converted into a battalion command post. Among the arrivals was S/Sgt. Raymond Hill, the radio operator of our airplane. He had landed close by the Issel Canal and was immediately taken prisoner by a German who had watched him coming down. As they were about to march off, a burst of machine gun fire dropped the German with a bullet through his shoulder. The German thereupon surrendered to Hill. They started off in another direction, but they had taken only a few steps when a burst of fire raked the area. The wounded German didn't duck quickly enough. When Hill left him a few minutes later he was dead.

Shortly after 1200, the Liberators came winging over the battle area, just above the tree tops, dropping bundles of ammunition and equipment. By this time many of the flak guns either had been silenced by our fighters or captured by the paratroops. A few, however, were still blazing away and we saw one B-24 sink behind the trees, its engines blazing. Later we learned that nine of these resupply planes were lost to enemy action.

At about 1300, patrols reported several German tanks and a number of half-tracks were massing for a counterattack against the railroad station. Since the battalion had nothing in the way of heavy guns, the commander put in a hurried radio call for help. Within 10 minutes a formation of our rocket-carrying fighters came in and worked on the German armor. That was the end of the counterattack.

Late in the afternoon, Hill and I made our way to the division command post. The American and British paratroopers had consolidated their positions. Before nightfall, contact was established with the forces that had crossed the Rhine prior to the airborne landings.

The next morning, S/Sgt. Galen Boltjes, our crew chief, turned up. He had landed in the middle of a field that was under fire from both sides.

"I buried my nose in furrows and stayed there all afternoon and night," he related. "Every time I lifted my head someone took a shot at me."

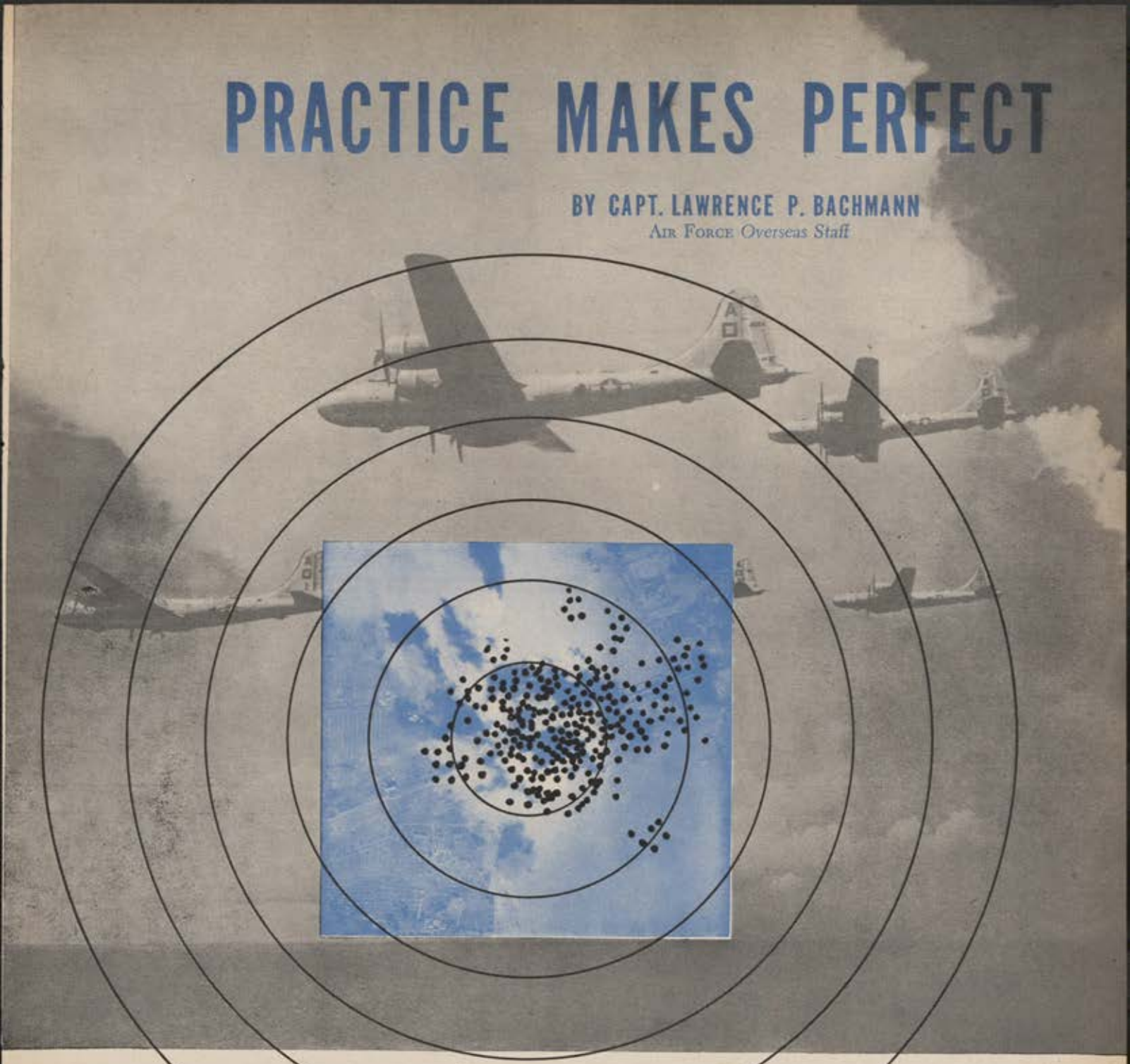
Galen, Hill and I moved on to the American Division Headquarters located in a forest nearer the Rhine. There we met Bud Hutton, correspondent for STARS AND STRIPES, who told us half the paratroopers from our plane had been killed. Some were shot as they floated down in their parachutes, others died in an assault against a German regi-

(Continued on Page 58)

H-hour breaks and paratroopers shower into the Rees-Wesel area. Sgt. F. Quandt took this photo from B-17 shown on Page 58.

PRACTICE MAKES PERFECT

BY CAPT. LAWRENCE P. BACHMANN
AIR FORCE *Overseas Staff*



Training never ends for our B-29 combat crews, who "go to school" even while dropping their bombs over Tokyo

IF potential B-29 crewmen think their training will have been completed when they begin to fly combat missions, they have another guess coming. Their transition instruction by the Training Command, combat crew training by the 2nd Air Force and replacement crew indoctrination by the overseas command to which they're assigned represent only the beginning of a course which won't be concluded until the airmen are returned to the United States for reassignment or discharge. Maj. Gen. Curtis E. LeMay and Brig. Gen. Roger M. Ramey, respective commanders of the 21st and 20th Bomber Commands, are strong in their belief

Precision gained by 20th Air Force bombardiers through intensive training is seen in the above illustration, composed of bomb plot and photo made during attack on the Rama VI Bridge at Bangkok. Superforts cripple enemy communications as well as war industry.

Model of Yawata (on floor) is used with A2 Trainer to drill bombardier for attack on that important target.

that a bombardment outfit's effectiveness is directly proportional to the amount of training it undergoes. If they can help it, no misfit will mar the operational smoothness for which the 20th Air Force is noted. And they are helping it. For they're well aware that one man's ineptitude may ruin a mission, perhaps bring death to an entire crew.

This continuous combat training, which originated under General LeMay when he headed the 20th Bomber Command in India, proved so successful that it was adopted by the 21st Bomber Command in the Marianas. It has paid off richly in dividends, in the mounting devastation that is being rained on industrial Japan by our Superforts.

Nothing is taken for granted when a new B-29 crew arrives in a theater of operations. The competency of each individual must be proved before he is assigned to replacement crew training. By interviews and tests, the group operations officer and group specialists determine just how well each crew member knows the fundamentals of his job.

It can be said to the credit of the Training Command and the 2nd Air Force that nearly all their B-29 graduates are more than adequately prepared to pass the 20th Air Force's preliminary tests without difficulty.

Naturally, however, a few crewmen arrive overseas with deficiencies which must be corrected before they can qualify for replacement crew training, even if such action necessitates grounding a man or an entire crew indefinitely.

Shortcomings of this below-par group usually run pretty much to a standard pattern. There are pilots who are able flyers but weak commanders; bombardiers who are insufficient in their role of key man in the operation of the Remote Control Turret system; navigators who need additional instruction in celestial and long range navigation, the proper method of keeping a log and the use and maintenance of the gyro fluxgate compass; engineers who have not learned to cooperate fully with their pilots, and gunners who are short on teamwork or who are unable to use the K20 camera efficiently.

Replacement crew training, which indoctrinates new crews in the tactics and policies of the combat command, is given at group level.

A training officer, who supervises the ground school, and the assistant group operations officer, who is in charge of flying instruction, are aided in conducting the replacement training program by group specialists and members of the lead crews.

In the ground school, pilots and copilots receive 10 hours of instruction in flight engineering, a minimum of five hours in communications, four hours in emergency procedures and several hours in each of weather, landing and general procedures.

For the bombardier, the curriculum prescribes intensive study of the Remote Control Turret system until its operation is mastered, 10 hours in target identification, a minimum of two hours weekly in the A5 Bomb Trainer and camera practice until proficiency is attained.

Navigators are taught theater navigation aids until they know them thoroughly, and they receive two hours in each of weather, terrain, tactical missions and "over the Hump" communications and an hour in general procedures such as direction finding, air-ground communications and air-to-air homing. In addition, they are given supervised review in front gunner's duties, photography and the gyro fluxgate compass.

Following 10 hours' work in standing operating procedures, the flight engineers study factors affecting output, efficiency and endurance of B-29 engines, cruise control, aircraft performance, weight and balance and emergency procedures.

Gunners are given as much instruction as they individually require in aircraft and surface craft identification, two hours in standing operating procedures, two hours in scanning, tracking and firing and an hour in enemy tactics. They are also checked in the maintenance and use of their guns and the Remote Control Turret system and in the correction of malfunctions.

The schedule for radio operators includes two hours in "over the Hump" missions, two hours in tactical missions and an hour in general procedures.

Upon completion of ground school, the new crew enters the air phase of the replacement training program. During this period, which lasts from one to two weeks, the crew flies practice missions in formation while group specialists observe the progress of each individual. The pilot, meanwhile, is also checked out in instrument flying, and he rides as an observer on a combat mission with an experienced crew.

The climax of replacement crew training comes with a long-range mission. If that is accomplished satisfactorily, the new crew is considered ready to play its part in carrying the war to the enemy homeland.

But, as it was pointed out earlier, assignment to combat duty does not mark the conclusion of training. It merely means eligibility to begin general crew training in which every man on flying duty in the 20th Air Force participates.

Between combat missions, a rigorous course of instruction and practice is pursued. The missions themselves are considered part of the training program, for lessons learned in battle are the most valuable, and the lengthy critiques which follow every attack on the enemy are especially helpful. Mistakes are pointed out and discussed, and corrective measures are recommended so that the errors will not be repeated.

For the most part, general crew training is a refinement of replacement crew training. The airmen are drilled again and again in procedures and tactics until their work becomes second nature to them and they are able to meet any possible situation without hesitation.

Ground schooling is alternated with flying. Thus theory learned in the classroom is applied in the air. To effect this arrangement, each squadron is divided into A and B flights.

While one flies on combat or practice missions, the other attends school at the base. The progress of each individual is recorded on charts posted by the training officer.

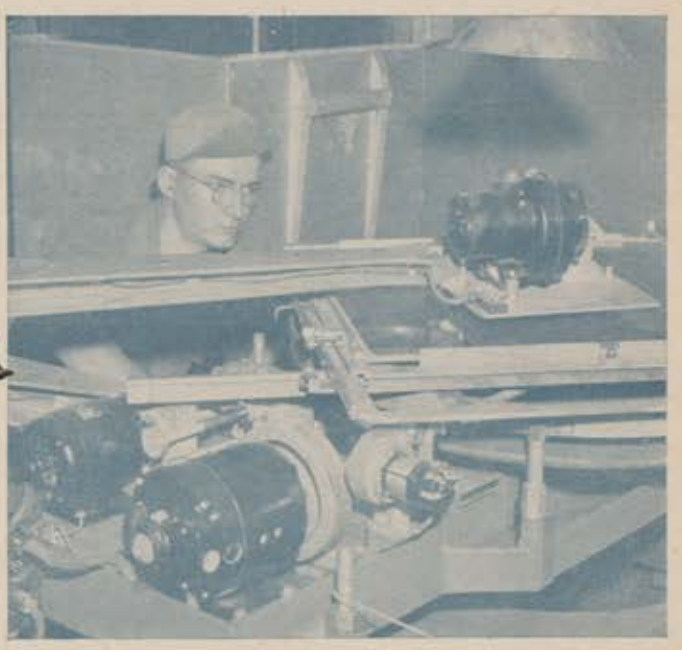
In classroom and in the air, emphasis is placed upon teamwork. By studying together constantly, crewmen whose duties are interrelated become familiar with each others' problems and discover how complete cooperation can best be achieved.

Synthetic training devices have proved of great value in ground school. By use of the A5 and A2 bomb trainers with models and photographs of targets slated to be struck later in combat, bombardiers can practice every possible approach as well as offset or checkpoint bombing. Other training devices help the gunners to retain their sharpness.

Training missions, which are flown in formation, are usually of five hours duration so that every crewman can gain ample practice in his specialty. On the way to the dummy targets, the B-29s are "attacked" by AAF fighter planes and hits scored by the Superfort gunners are recorded by camera. Following the bombing runs, the men are drilled in emergency procedures.

Since lead crews have the greatest responsibility in combat, they work hardest of all in the training program. The practice schedule of other crews hinges upon the availability of planes for that purpose, but lead crews fly every second day either on combat or training missions. ☆

Mock-up of B-29 upper turret sighting station at overseas ground school of the 20th Air Force enables gunner to sharpen his eye.



Recon photo of potential target is projected by this unit of the A5 Bombardier Trainer on a horizontal screen beneath bombsight

Frequent practice with this mock-up of a B-29 blister sighting station keeps a gunner at peak of efficiency.

Flight engineers view a training film as part of the continuous course of instruction given B-29 crews in theaters of operations.

Statue of Kaiserin Augusta on Kaiser Wilhelm-Ring, Cologne.

An AAF bulldozer disposes of a JU88 from an advanced airfield.

this was COLOGNE

PHOTOS BY T/SGT. ROGER COSTER

AIR FORCE *Staff Photographer*

The devastating effects of all-out war on a modern industrial city were seen at ground-level for the first time when Allied observers moved into Cologne in the wake of the ground forces early in March. A by-word for Allied striking power since May 1942, when the RAF chose it as the target for its first 1,000 plane raid, Cologne took a place on the AAF Hit Parade in February 1944. Since then it has become one of the 10 European cities most heavily bombed by the AAF, absorbing a total of 12,418 tons. Of these, nearly 8,000 were dropped in the three days of October 14, 15 and 17. The total for all Allied air forces were 42,000 tons.

Residents of Cologne attest that it was these October attacks (swelled by the RAF night effort) which finally immobilized the public utilities of Cologne, made restoration of transport a hopeless task, virtually ended its industrial contribution to the German war effort. Preliminary assessment was that 60% of the industrial and built-up area of Cologne had been leveled, though the famous cathedral escaped a direct hit. The pre-war population of 720,000 had dwindled to 100,000.

Mass of rubble is all that remains of a Cologne residential area.

◆ Cathedral looks down on the ruins of Germany's fourth city.

Two vehicles can scarcely pass on this bomb-gutted thoroughfare.

With a blasted tank beside it and a sign warning sightseers not to approach closer, the Cathedral maintains its watch on the no longer sacred Rhine. Scarred by blast, it escaped a direct hit by any of the 42,000 tons of bombs dropped by Allied flyers.

(Continued from Page 13)

sergeant to fly in anything less than perfect physical condition. He can remind him that the plane might have been lost to flak, or to fighters coming in head-on. He can insist that the chances of failure on the part of the substitute gunner were practically nil. He can bolster the sergeant's shaky ego by praising him for acting according to regulations. In these cases, a thorough ventilation of the subject is usually enough to put the patient back on his feet.

Lt. Y is a fighter pilot, a fairly strong personality who did not get on very well with his squadron mates overseas and who is now troubled by a frightening and recurring dream. He dreams that he is trying to swallow something too large for his throat, that it will not go down. It chokes him, and he wakes up coughing and disturbed.

Discussion of the lieutenant's experiences overseas reveals that on his fifth or sixth mission his plane was shot up, he landed without brakes, ran off the end of the runway into a crowd of spectators and killed one of them. An investigating board reported that the accident was 50% attributable to pilot error, 50% to mechanical failure. Lt. Y did not agree with this verdict; he felt that nobody could have prevented the accident. He felt, furthermore, that from that moment he was under a cloud, that his chances for promotion were lost, that his flying mates no longer respected him. He finished his tour, but he was far from happy, and when he came home he began to be troubled by this dream.

The psychiatrist points out, to begin with, that the dream is simply a pictorialization of his inability to 'swallow' the decision that he considered so unfair. It is still 'stuck in his craw'. (Admittedly, few dreams are as 'pat' as this one, but the case is by no means impossible.) The lieutenant is told that he should stop worrying about the past, that he has an important future ahead of him. The psychiatrist may remark mildly that no one is infallible, that quite possibly the investigating board was wrong. In any case, no one is holding the accident against the lieutenant now. He ought to see his problem for what it is, examine it in the light of day, so to speak, and put it in its proper perspective. As soon as he does, in all likelihood the dream will cease, and he can go forward on a new phase of his Army career.

The case of Capt. Z is a little more difficult. He had, on one occasion, the particularly harrowing experience of seeing his navigator's head blown off by flak. The navigator was a very close friend of his. He was so shaken by the experience that he was sent to a rest-home for two weeks, but eventually came back and finished his tour. He thinks he has recovered from the shock of that experience, but he has not. It lies buried within him much as a splinter can lie buried within a finger. And like the splinter, it must be removed, or it will fester. In the case of Capt. Z the festering has manifested itself in some of the above symptoms.

Just why 're-living' the experience under psychiatric guidance will relieve tension and allow the healing processes to begin is something that no one fully understands, but everyone has experienced the sense of freedom and release that comes from 'getting something off your chest'. In any case, once the pent-up emotions centering around this experience have been liberated, Capt. Z can begin to live normally again.

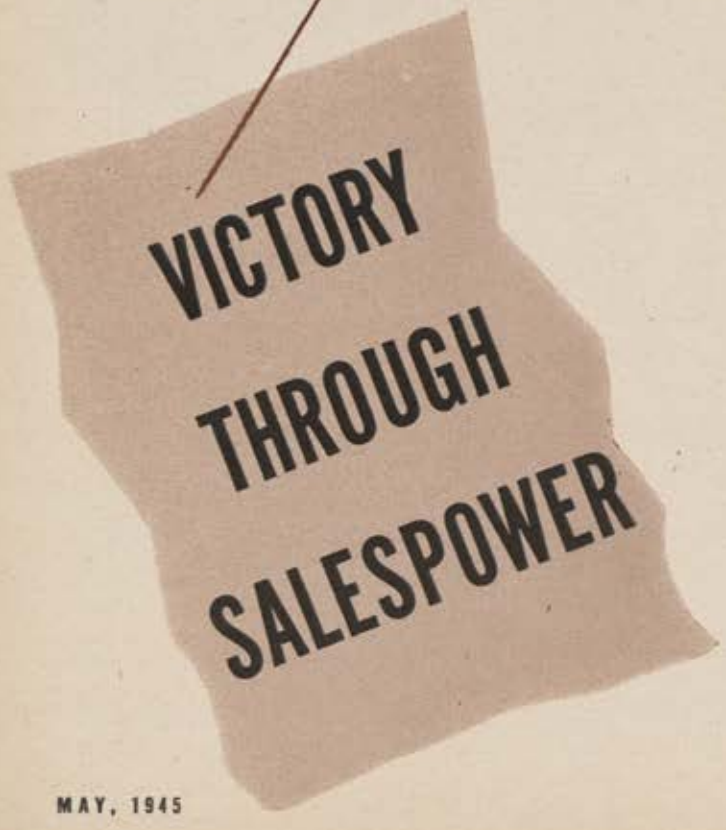
In mild cases, group therapy, discussion and minimum 'ventilation' of the problem usually suffice to send the patient back to duty in a relatively short time. But sometimes the conflict is buried so deep in the patient's mind that a more lengthy process is required. In such case, AAF psychiatrists can occasionally speed up the process by using pentothal sodium. This medicine is a sedative which saves valuable time by enabling the doctor to uncover repressed ideas in the patient's mind more rapidly than would otherwise be possible. It has no harmful effects whatever; the boys wryly call it "flak juice."

In this treatment, the patient does not fully lose consciousness when the pentothal is administered. He remains aware that he is in the hospital being questioned by a doctor. In successful reactions he may relate, in his own words, the combat incident that sometimes lies at the root of his difficulties. He may describe it very dramatically, and the emotions thus liberated can be extremely strong. The material is not always confined to battle experiences; older struggles within the personality may appear, thus simplifying the task of the psychiatrist in subsequent therapy. The pentothal treatment is not always an unqualified success, but doctors at the Don Ce-Sar feel that it is more effective than the artificial rest treatment by prolonged narcosis that was developed earlier in the war.

At bases to which combat returnees may be sent, it is extremely important for flight surgeons and commanding officers to familiarize themselves with symptoms of operational fatigue. Early recognition of such cases saves much time and trouble in the long run. In the early days of the war there was a tendency among some commanders to view such symptoms as a deliberate attempt to evade combat. The fact that such symptoms not only persist but sometimes grow worse after combat indicates the reality of such mental illness. Experienced observers feel that there is practically no 'malingering' as such in the AAF. The caliber and morale of its personnel are too high. If a man's behavior deteriorates suddenly, there is a strong possibility that he is ill and needs treatment.

Each returnee wants to feel that his contribution to the Army is still important. The broad objective of the AAF Convalescent Hospital System is to restore the physically or psychologically disabled returnee's self-confidence and self-respect—to convince him that he has a job to do and can do it. The role that his new CO should play in this regard is obvious. If a man steps into a job that keeps him busy and gives him a sense of accomplishment, his readjustment to non-combat life is much easier. The doctors at the Don Ce-Sar do not worry about their discharged patients who find such CO's and such jobs. They know that further treatment will not be necessary. ☆

A 24-year old German paratrooper took the advice of an Allied leaflet and surrendered to American troops in France. Leaflets were prepared by Psychological Warfare Division of Allied forces and fired by light artillery into the area held by the Germans.



AAF pilots are crack salesmen in the psychological campaign to "sell" defeat to the enemy

Psychological warfare is the battle waged with ideas and words. Part of this warfare is the bombardment of enemy troops and civilians with airborne leaflets bearing messages to undermine their morale. To accomplish this, the AAF has many "aerial newsboys," pilots who deliver this printed propaganda to the enemy.

One of the latest developments in psychological warfare is the newspaper "Frontpost," which is printed in the German language and delivered daily to enemy foxholes by the 12th Air Force in Italy. It is designed to give the German soldier a straightforward account of the progress of both German and Allied war operations. The "Frontpost" has been instrumental in the surrender of thousands of enemy troops in Italy.

Psychological warfare is simply the means of using against an enemy the principles of suggestion and psychology which have been used in salesmanship since the beginning of time. It plays on the fears, hates and loves of the enemy. It is designed to undermine his faith in his leaders, his government, and eventually to destroy his morale and willingness to fight.

The lines of argument taken by Allied psychological war-

These thousands of leaflets represent one single attack upon the enemy's morale. The message of these leaflets is to make him stop and wonder if the fight is worthwhile. This new type leaflet bomb will carry five bundles and when packed weighs 500 pounds.

fare are as countless and unpredictable as are the changing situations of war. Long-range propaganda hammers away month after month on Allied war aims and emphasizes the ideals for which the Allies are fighting.

Sometimes it is merely a reminder, a question for the enemy to reflect upon and answer. Such propaganda was the purpose of leaflets showered down on the Jap-occupied territories during the Philippines operations. The Japanese had told their soldiers the AAF had been destroyed.

This leaflet, on one side, showed American heavy bombers in the air. On the reverse side was the message. It asked the Japs a simple question: "Whose planes fill the sky?" It asked them to look up at the sky and decide whether the planes they saw were Japanese or American. It reminded them that according to their rulers the AAF had been destroyed.

Through psychological warfare friendly elements in enemy-occupied territory are encouraged, promised sympathetic help after their countries are freed, and instructed how best to cooperate with the Allied military. Unfriendly elements are warned of the punishment which will overtake them, and civilians are warned to keep away from places which are about to be bombed. Even packages of seed have been dropped, along with friendly messages, in areas which would soon be occupied by the Allies and from which most of the food had been carted off by the enemy. The idea was that the natives would plant the seeds and grow vegetables, thereby lessening the problem of feeding them after Allied occupation.

Hundreds of leaflets flutter down into a Japanese-held village almost completely hidden by the thick jungles of Burma. Leaflets are designed to counteract Jap propaganda and give correct data about the progress of the war on this and other battle fronts.

The two chief vehicles for carrying the weapons of psychological warfare—words and ideas—to the enemy are leaflets and radio. In the strategic field, short and medium wavelength radio is the more important weapon. While vast quantities of airborne leaflets are scattered over the enemy home populations, more people hear the messages over their radio sets than see them in printed form. In the tactical field the reverse is true. Relatively few field soldiers have opportunity to listen to radio sets, and both Japs and Germans have systems of informers who keep vigilant watch on such activity. But, in spite of all their efforts and threats, both have been unable to keep their soldiers from reading and keeping the leaflets which are showered on them by plane and fired into their areas by artillery shells.

While the types of leaflets disseminated to friend and foe are infinite in number, the "surrender pass" shows the most tangible results. When a German or Jap comes over, shows a leaflet and tells the interrogator that its message had induced him to surrender, there can be small doubt that leaflets are effective. But the "surrender pass" represents only a small percentage of the total leaflets used, and

The German-language tabloid Frontpost, designed to give Germans the world news from an unbiased viewpoint, is distributed daily to enemy foxholes. It is carried in revamped practice bombs which open up on trigger release and dump the papers on their targets.

the surrender of enemy soldiers is but a small part of the overall effect that psychological warfare is achieving.

Airborne leaflets worked admirably against the Italians who valued them so highly that Arabs did a brisk business of gathering surrender passes and retailing them for the equivalent of two dollars each. Leaflets are effective against the Germans, and in the CBI they led to the surrender of Japs at Imphal, Kamaing and Myitkyina. An Army corps in the Philippines reported recently that during one week 278 prisoners had been taken, and that nearly all of them had been influenced by propaganda leaflets.

It is well known that propaganda is most effective when the tide of battle is running against the enemy, and for that reason airborne leaflets are expected to bring in greater numbers of enemy soldiers in the closing phases of the war. The more critical his plight, the more effective psychological warfare becomes. ☆

CROSS COUNTRY

News and Views around the World

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French Air Force

The French Air Force, badly beaten but not completely crushed in 1940, has returned to a place of importance in the European Theater of Operations.

When France fell many of its flyers, with Allied assistance, set out for England and to the Middle East to continue the fight with the RAF. Others remained behind to become part of the so-called armistice air force—a token organization under the control of Vichy and limited to a handful of squadrons.

In 1941, England made the first important move in reestablishing the French Air Force as a fighting organization. Two French bomber squadrons—the Lorraine and Bretagne—were equipped and fought during the African campaign. The Ardennes fighter squadron—a DeGaulle unit—did good work in the Middle East. Other Frenchmen flew with the RAF from English bases.

When the Americans landed in North Africa they immediately assumed a large share of the burden of revitalizing the French Air Force. One of the first moves of the AAF was to put the famous Lafayette Escadrille back into the air. They furnished the squadron with P-40s in November of 1942 and were rewarded when the Escadrille handled itself well in the Tunisian campaign and the invasion of Sicily. Other French units benefited from the flow of American supplies.

Soon after the liberation of Paris in 1944, the AAF moved to restore a sizeable French Air Force on French soil. With many of the pilots and crews who served in Africa as its beginning, the First French Air Force was established last October. Under the careful ministrations of AAF experts, the French First is developing. At present its bomber groups fly Marauders and its fighter pilots go out in Spitfires and Thunderbolts. The AAF also has turned over some Lightnings and Mustangs for reconnaissance work.

The British are continuing to lend a helping hand. French airmen still are operating with the RAF in Spitfires and Lancasters. There are also some Frenchmen flying P-39s with the MAAF while another French group is serving with the Russians.

Along the coastal pockets where isolated German garrisons still hold out, the Atlantic French Air Force, commanded by General Edward Corniglion Molinier, an ace of World War I, is battling le Boche with JU-88s, Potez 63s and anything it can lay its hands on and put into flying condition.

It is the intention of the AAF to place the First French Air Force on a self-sustaining basis. This won't be an easy job for it means that the Americans will have to supply the units under their operational command with everything that is needed in the way of supplies and equipment. The aim of the AAF is for these units to operate efficiently once they are back on their own.

French pilots trained in the United States are already flying in combat, but there is a need for more mechanics. The French are learning American operational techniques from AAF officers, and technicians from American aircraft factories are on hand to give needed advice. It is a slow process, but AAF chiefs in France think the First French Air Force should be doing pretty well for itself within a very short time.

French airmen drink—to a new start under their own flag

Reminders

To make P-47 trainees more safety conscious, reminder signs have been placed off the edge of taxi strips leading to runways at Bradley Field, Conn. As a pilot taxies out to the runway his mind is jogged by five signs, spaced along the route. They say, at proper intervals: Use ALL of Runway . . . Fasten Shoulder Harness . . . 91 Octane . . . Cockpit Check . . . Look Behind Before Runup. After landing, and on his way back to the parking ramp, the reverse of the signs read: Stop to Raise Flaps . . . Log Correct Time . . . Open Cowl Flaps . . . Are you "S"ing . . . 7-8000 RPM While Taxiing.

Although these prompters are repeated often in briefing, Bradley Field's safety record has improved considerably since the signs were installed.

Welcome

Orientation is a common term to Army recruits, but to 175 former infantrymen at an AAF Service Command air depot in Italy, the word has a new meaning. Reassigned from ground combat forces for physical reasons, the men are being trained for their new jobs of servicing and repairing AAF bomber and fighter aircraft, operating airbases, or constructing airfields.

To bridge the gap for the men who came from a service where the emphasis was on combat effectiveness, to one where, for them, the emphasis will be on technical skills, the need was recognized for an orientation program which would be timely and effective both to the Air Forces and to the new men.

Accordingly, a program has been designed "to remove some of the mental confusion that inevitably exists in the minds of recently transferred men," says Capt. Phil E. Allen, group adjutant and one of the key officers behind the program.

"We want to show the new men that we are proud of what they have done in the past, and that we will do everything in our power to make their life here as air force soldiers the best possible," Captain Allen said.

In the first phase of the orientation, the men were conducted on a tour of depot installations and shown at first hand the workings of the depot. The second phase was

devoted to a two-week school to teach the men the many-sided and technical nature of supply work.

After completing the school training, the men will be transferred to on-the-job training where they will engage in the actual work of the depot. The length of this phase of the training will be dependent upon the individual's display for ability for assignment to a job.

Chinese-American

The two men on Cross Country's cover this month are Col. Irving L. Branch and Maj. H. Y. Lee. When the picture was taken they were co-commanders of a B-25 Group in the Chinese-American Composite Wing. (Colonel Branch has since returned to the United States.) This is the only outfit of its kind and in it Chinese and American flyers fight side by side. The wing also has two fighter groups, and is under the command of Brig. Gen. Winslow C. Morse.

The personnel ratio is approximately one American to four Chinese. Most of the Chinese flyers were trained in the United States but some came directly from the Chinese Air Force. One of the chief purposes of the wing is to teach Chinese flyers American combat methods. Operating under the 14th Air Force, it has nearly 18 months of combat behind it. It often has operated on a night and day basis.

Stationed in the forward China combat area, the wing has had the job of stopping everything that moved, over a wide area, in the air, on land or water. The CACW did a lot of strafing by day, and stopped most of the road and river movement; so, the Japs began to wait for moonless nights to move their supplies. Further to slow supply movement a plan was worked out that involved deck strafing by B-25s—on moonless nights.

Flying low down the valleys, the B-25s located convoys and strafed them until all lights were extinguished, and then proceeded to drop their bombs on other targets. The Japanese, after a period of quiet, would attempt to move the convoy, only to be attacked again by the returning bombers. In this manner, a small number of B-25s kept large truck convoys stationary during the night and made possible their destruction by fighters the following day.

The B-25s have had one big favorite daylight target, a very important Yellow River bridge. It has been knocked out by the mediums, rebuilt by the Japs and knocked out again so many times that the flyers have lost count.

As for what the fighters do by day, we cite the sortie results of one good weather day. This day was by no means outstanding; it's just typical.

On river and road sweeps, the CACW P-40's destroyed 11 locomotives, three railroad cars, 25 buildings, four trucks, one sampan, two machine gun positions, 26 horses, two tanks, one watertower, two radio stations, one compound area, 69 Japs and 31 fighters and bombers on the ground,

QUESTIONS
on Policy and Procedure

Q. Are officers appointed in the AUS and assigned to duty in the Air Corps entitled to receive, upon release from active duty, the additional $500 lump sum payment for each complete year of active duty with the Air Corps provided for certain Air Corps Reserve Officers?

A. *No. (Opinion of Comp. Gen., B-44390, 5 December 1944, as shown in Bulletin of The JAG, No. 12, Vol. III, December 1944, page 530.)*

Q. Does the GI Bill of Rights require that a veteran must be experienced in order to obtain a loan to start a small business?

A. *One of the principal requirements of the law is that the ability and experience of the veteran and the conditions under which he proposes to pursue such occupation are such that there is a reasonable likelihood that he will be successful in the pursuit of such occupation. This clause is in sec 503, chap V, title III.*

Q. Can the terms "allowance" and "allotment" be used interchangeable?

A. *No. Many letters received by the Office of Dependency Benefits refer to both family allowances and Class E allotments of pay as "allotments." Incorrect use of these terms causes delays in replying to inquiries and in processing the cases because each benefit is handled in a separate division of ODB. A family allowance consists of a contribution made by the soldier known as a Class F deduction on the pay roll and a contribution added by the Government. A Class E allotment of pay comes entirely from the serviceman's pay.*

Q. What is the recommended amount of cash to be taken by personnel going overseas?

A. *Personnel should convert all surplus holdings of United States currency into Treasury checks or travelers checks of the issues authorized in Cir. 364, WD, 1944. Normally not in excess of $50 in cash should be retained. Personnel should not plan to negotiate personal checks after arrival overseas. (Par 34, b, sec VII, POM)*

Q. Is service in the Woman's Army Auxiliary Corps counted for the purpose of computing longevity pay of Wacs?

A. *No. (Sec I, Cir 64, 1945)*

Q. Are any Air Corps Circulars still in effect?

A. *No. The last two circulars were rescinded by AAF Reg 0-3, 26 February 1945. The entire series is now terminated.*

Q. Is there any provision for commissioning an AUS officer in the Regular Army at this time?

A. *No. However, it is a logical assumption that such provision will be made to cover commissioning in the postwar period.*

Q. In what grade will an enlisted man of the Regular Army, who serves on active duty as a Reserve Officer or who is discharged to accept a commission in the Army of the United States, be entitled to reenlist in the Regular Army after the termination of such commissioned service?

A. *In the permanent grade held in the Regular Army immediately preceding the commissioned service. However, during the present war and such further period as the Secretary of War may prescribe, upon reenlistment in the Regular Army, such enlisted men will be immediately appointed in the Army of the United States to any higher temporary enlisted grade held by him immediately preceding his commissioned service. Application for reenlistment must be made within 6 months after the termination of commissioned service. (Par 19d, AR 600-700, 30 September 1942, as amended.)*

Q. When allowances in T/E 21 equipment are decreased or suspended, is it intended that the excess created be taken up from personnel immediately?

A. *No. Decreases or suspension of T/E 21 are emergency measures, and it is not the intent of such action to remove equipment already in the hands of troops. Items issued subsequent to suspension or decrease will be governed accordingly.*

Q. Were the increases in pay for officers, effective 1 June 1942, for the duration of the war only? What were the increases?

A. *There is no restriction in the legislation which authorized the increases regarding their effective period. Base pay of officers in the 1st period (2nd Lts.) was increased from $1,500 to $1,800. Subsistence allowances for officers was increased from 60 to 70 cents per day.*

PREPARED BY THE OFFICE OF THE AIR INSPECTOR

AIR FORCE MAGAZINE

"Never mind that stuff, Homer, we're strictly service pilots!"

damaged 42 railroad cars, 11 sampans, 172 buildings, one large barge loaded with supplies, two compound areas, one railroad tower, three tanks, eight machine gun positions and one warehouse, and four Jap aircraft.

During one two-week period, the 5th Fighter Group of the CACW hit the same Jap airfield three times, destroying approximately 70 enemy planes on the ground and in the air for the loss of only two.

Many of the CACW's missions have been over the China Sea and it has also hit Formosa.

Hot Minutes

Every combat man has his own words for describing the bomb run, some more articulate than others. Flight Officer Leonard Nelson of the ETO has set down a little thumbnail sketch called "The Hot 10 Minutes," which describes the bomb run very well. Here it is:

It takes four hours for our group to reach the average target, and most of our bomb runs take about 10 minutes. Ask anyone who has done it—the four hours go like minutes, the 10 minutes last an eternity.

As usual, the sky ahead was black. It reminded me of attending the theater, but instead of waiting for the curtain to go up, you fly through it, slicing your way with the propellers. Fred, our bombardier, peered ahead and put his hand to his cheek, then shook his head from side to side. Fred always claimed that the flak looked thicker on each successive mission, and this time I agreed with him.

Suddenly we were in the thick of it. Our B-17 was like a Central Park rowboat which had fared out into the stormy North Atlantic. Ka-woom! KA-WOOM! You could hear it coming closer. Jerry was getting his sights right on us. We flew straight on course, evading from left to right as the flak burst all around us—ugly black and red explosions which showered jagged pieces of metal on our plane.

"Good, God! How much longer do we have to go through this stuff?" the pilot muttered.

"Only another minute," I answered. Where I got my optimism I don't know.

Seconds lasted hours, as nine of us waited for Fred to call bombs away.

"Ten seconds to go," Fred called slowly, and in those 10 long seconds my heart must have made 50 visitations to my mouth and back.

"Bombs away!" Fred yelled, and the radioman keeping watch in the bomb bay hoarsely acknowledged his cry.

Pat banked the ship viciously to the right, setting her on one wing, and shoved the throttle full forward. The engines thundered and the big ship shivered in the turn. Oh, beautiful!

Flak burst right where we would have been, and in a matter of seconds it was upon us again — but the weight of bombs was off our minds and out of the plane. Without bombs I had supreme confidence that Pat could fly at 50 feet through the Black Forest without scratching the paint. Almost immediately the flak became thinner, and only an occasional burst came close enough to be heard.

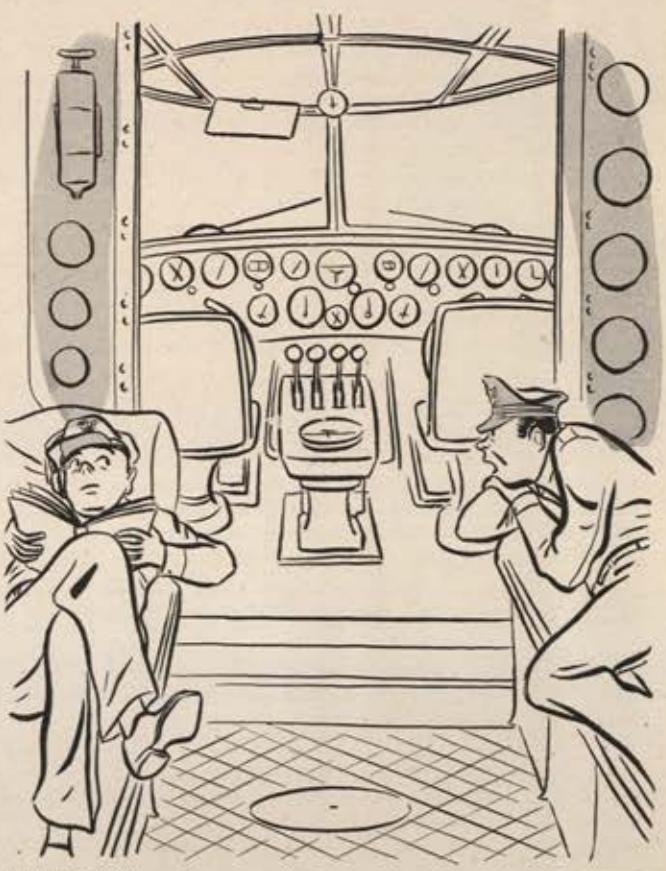
Below us a tank factory went up in flames, and as the smoke cleared there was no factory there. Off to our left two Fortresses went down and for a few moments we were quiet, counting the parachutes and wondering who had gotten it that day.

The Fort eased back to its cruising speed; the formation got together again; planes swung slowly around and pointed their noses toward home. Fred picked up his H. L. Mencken and began reading about the foolishness of religion—but I knew his other side. (He prayed like a demon on every bomb run.) I went back to my logs and maps, and the business of navigating.

The hot 10 minutes were over for that day.

Save That Chute

Several plain and fancy tricks described in "Save That Chute," an article which appeared in AIR FORCE recently, have been incorporated into a definitive AAF Manual, No. 60-1, called Emergency Uses of the Parachute. The booklet, prepared by the Arctic, Desert and Tropic Branch of the AAF Tactical Center, Orlando, Fla., de-



AIR FORCE MAGAZINE WILKENSON

"You don't think we're taking the name 'automatic pilot' too literally?"

scribes 45 emergency devices which can be made from a parachute. The 24-page booklet is designed to fit in a pocket of the parachute pack with the Parachute Log Record. It is printed on waterproof stock and when folded the new AAF manual is about three and a half by two and one eighth inches.

Retired List

The Officers Honorary Retired List has been established "to provide a measure of recognition for officers and former officers of the Army of the United States, not members of the Regular Army, who have served faithfully and well for long periods of service or during national emergencies." The list is established by Section 1, General Orders, No. 11, War Department, 1945.

AR No. 605-255, dated Feb. 24, 1945, provides that the list will be published annually as a section of the Official Army Register. Former AUS commissioned officers are eligible if they meet any of the following requirements: Reached the age of 60; completed 15 years of honorable service in active or inactive status; become physically disqualified for general military service not as result of misconduct or undesirable habits; served honorably in time of national emergency but not eligible because of age or physical condition for appointment or reappointment in the National Guard or Officers Reserve.

No pay and allowances accrue and officers will be placed upon the list only upon their own application to the Adjutant General.

Grasshopper

Here's what T/Sgt. Glenn C. Basset, a liaison pilot in CBI, has to say about his life and times in a Cub:

"It took me a long time to get over the disappointment of being rejected for pilot training. But finally, somebody told me about Civilian Pilot Training. I got into that as soon as I could, but wasn't too happy. I kept thinking I should be flying a bomber.

"After a great deal of marching I was put in a replacement training unit and did some flying with the infantry, artillery and tanks. In contrast with basic training this was wonderful, sailing around above those boys who were in mock battles on the ground. It was not as good as bomber training would have been, but at least I was in the air, and not on the ground.

"After training with the Ground Forces five of us Liaison pilots were alerted and told we would be shipped out to the Mediterranean. I had gotten pretty well acquainted with one of the other pilots and we decided it would be a good idea if he also got on that shipping list. He went to see the CO.

"When he came back from making his request he told me he had been reminded again never to volunteer. 'I told them I wanted to go along with you, and they promptly messed it up. They took me—and dropped you from the shipping list.'

PLANE BONERS

Analyzed by Veteran Pilots

VICTORIA, TEXAS—After landing peel-off, P-51A pilot entered base leg with gear down and locked. Warning light for right wheel showed green, left wheel light was out. Pilot landed with right wheel extended and left wheel only three-fourths down.

Comment: Ignoring warning lights doesn't add to their value. This pilot assumed that gear was down and locked because one light showed green and the other one wasn't working. Much safer procedure when lights aren't working is to buzz by tower for confirmation as to gear's position.

PYOTE, TEXAS—B-17 pilot felt an impact and heard a noise from his No. 2 engine while warming up for takeoff. Looking out he saw a red substance on the ramp below which looked like blood. Cutting switches, the pilot investigated and found that his No. 2 prop had struck an officer, killing him instantly.

Comment: What this officer was doing around the plane is unknown. Evidently he either fell or stepped back into the prop while in the vicinity of the navigator's escape hatch. Keep away from spinning props, they're sure death.

LONG BEACH, CALIF.—Right wing of a P-51D snapped off at the root when the pilot, during a ferry flight, zoomed into a speed dive, subjecting the plane to greater stress than designed for. The fighter went into a horizontal roll, then over into a tight spin straight to the ground. The pilot was killed.

Comment: Witnesses observed this plane cutting sky antics several minutes before the death-dealing dive. If the pilot had not broken ATC regulations about acrobatics while ferrying aircraft he would not have killed himself through lack of knowledge on stress limits.

TOPEKA, KANS.—Emergency wheels-down landing was made in a cornfield by an out-of-gas AT-11 just before reaching an airport. Plane was wrecked and four occupants injured.

Comment: Evidently this pilot is a slow-learner. Although he had almost 1,000 hours flying time he took off from Chicago without a definite idea of his fuel supply. In landing, to add to his amateurish flying sense, he picked a downwind field when several upwind fields were available.

RENO, NEV.—Pilot in C-46 made instrument takeoff and ordered copilot to retract gear. Copilot, not familiar with the procedure, fumbled around, causing pilot to glance down. While pilot watched copilot work on gear handle the airplane lost altitude, struck the ground and burned.

Comment: If the pilot had made certain his copilot understood landing gear procedure he would not have had to take his eyes from the instrument board and would have noticed the loss of altitude. In this particular case safety would have been added to the instrument takeoff if landing lights had been kept on until they were no longer of any use as takeoff direction was away from all ground lighting.

MARIANNA, FLA.—A-26 pilot dropped his gear at an excessive speed. Nose gear wasn't down and locked when plane landed and it skidded on its nose 1,300 feet before stopping.

Comment: Tests revealed that landing gear warning lights worked perfectly. Nosewheel green light was not on and red light was. By checking warning lights and observing travel of nosewheel through visual inspection plate this accident would have been avoided. Pilot Training Manual for the A-26 points out that nose gear should not be operated unless airspeed is 160 mph or less. At higher speeds it may not extend properly.

BURLINGTON, KAN.—After the engine of an A-24 quit during flight, the pilot made an unsuccessful attempt to restart it by switching to a full gasoline tank. In the emergency, he landed wheels down in a rough field. Although the landing gear was damaged slightly, he took off for his home station as soon as he got the engine going.

Comment: Violating the rules of common sense as well as AAF regulations, this pilot was lucky to reach his station alive. He invited disaster twice, first by ignoring fuel tank change procedure and again by taking off in a damaged plane without clearance or an engineering check.

PREPARED BY THE OFFICE OF FLYING SAFETY.

NEW BOOKS

AT WAR

CARRIER WAR. *Oliver Jensen.* A first-hand story of Task Force 58 and a year of war in the Pacific. N. Y., SIMON & SCHUSTER, 1945.

TWO HUNDRED THOUSAND FLYERS; THE STORY OF THE CIVILIAN-AAF PILOT TRAINING PROGRAM. *Willard Wiener.* The record of the AAF's Contract Pilot Schools in training Air Forces pilots. WASHINGTON, INFANTRY JOURNAL, 1945.

POSTWAR

CAREERS IN THE STEEL INDUSTRY. *B. W. Leyson.* The making of steel and the opportunities for a career in this industry. N. Y., DUTTON, 1945.

TECHNICAL

CARE AND USE OF HAND TOOLS. *R. R. Toliver.* Describes and illustrates the handling of common tools used in machine shops. N. Y., WILEY, 1944.

HANDBOOK OF AIRPLANE MAINTENANCE AND OPERATION. The assembly, service, maintenance, and overhaul of aircraft, engines and accessories. N. Y., NATIONAL AERONAUTICS COUNCIL, INC., 1944.

AN INTRODUCTION TO ELECTRONICS. *R. G. Hudson.* The new science of electronics with its present applications and future implications. N. Y., MACMILLAN, 1945.

MANUAL OF AIRCRAFT LAYOUT. *Rudolph Faltus* and *Charles Steinmetz.* Covers instruction in blueprint reading, template development and uses, and related topics. N. Y., WILEY, 1944.

METHODS IN CLIMATOLOGY. *Victor Conrad.* Presents methods of mathematical statistics applicable to climatological problems. CAMBRIDGE, MASS., HARVARD UNIVERSITY PRESS, 1944.

MILITARY AND COMMERCIAL AIRCRAFT HYDRAULICS. *R. N. Greif.* Covers one of the important functioning systems of the airplane. N. Y., PITMAN, 1944.

NEW WORLD OF MACHINES. *Harland Manchester.* A non-technical discussion of radar, high-octane gas, the turbo-supercharger, the helicopter, plastics and other new materials. N. Y., RANDOM HOUSE, 1945.

ROCKETS AND JETS. *H. S. Zim.* Latest facts about rockets and jet-propelled planes including battle rockets and post-war possibilities. N. Y., HARCOURT, BRACE, 1945.

YEARBOOKS AND HANDBOOKS

METALS AND ALLOYS DICTIONARY. *Menahem Merlub-Sobel.* Over 10,000 definitions of metallurgical terms, composition, properties and uses of the important commercial alloys. N. Y., CHEMICAL PUBLISHING CO., 1944.

These books are available to AAF personnel through the AAF Field Technical Library Service, which provides for technical libraries at all major installations. For personal copies contact the publishers or retail bookstores. List compiled by AAF Headquarters Library.

CROSS COUNTRY

"That was true. But a few days later I, too, was on my way—to Karachi, India, where I found they didn't know about Liaison pilots. In fact, the CO had never heard of such a thing. Finally they located a liaison squadron and we were sent to join it.

"My first operation flight was simple. A veteran pilot crawled into his plane, and told me to follow him. That was the briefing.

"I got on his tail and followed him over the hills and we went down on a little jungle strip. We picked up some wounded Chinese infantrymen and flew them to a hospital.

"That was pretty good, but it wasn't dropping bombs. I still had an idea you had to drop bombs from an airplane to make it worthwhile.

"From that day forward I seemed to be flying all the time. I hauled supplies to the front and brought out wounded Chinese, Ghurkas, Africans and Indians. I learned to do things with that little aircraft. I could feel my way along the bottom and fly when the ceiling was almost on the trees. I was flying day after day when bombers and fighters were sitting on the ground.

"I began to realize what I had when bomber pilots came around hoping to get a ride. Sometimes they would take a plane up and wring it out. One of them said, 'Sergeant, flying this thing is a pleasure. When you sit down at the controls of a B-24 you're in big business, with all the worries.' By that time I wasn't feeling too bad about being rejected for pilot training. I had come to think of my Cub as something personal—all mine.

"Then one day I was assigned to go into Northern Burma and bring out some wounded boys who were part of Merrill's Marauders. On the way back one infantryman with a serious leg wound called to me.

"The plane was so quiet that we seldom used the communication system. 'Hey, pilot!' he said. 'Back in the States I used to hate your guts. Especially when I'd see you Air Force guys sailing over me during maneuvers. Now I take it all back. How long before we get to a hospital?'

"'Two hours by air,' I said. 'By other means, three weeks.' And as I said it, I realized I was proud of my plane, my job, and my squadron."

Reception

When our invasion forces landed at Lingayen, Luzon, P.I., on January 9, they were enthusiastically greeted by two young AAF second lieutenants who were wearing their glistening gold bars and pilot's wings for the first time since May 1942.

Lt. Jose M. Rico (left) was stationed at Zablan Field, Manila, with the 10th Bomb Group (L) when the Japs struck at the Philippines. When he was captured on Bataan, he pinned his lieutenant's bars and pilot's wings to his underwear. As a result the Japs didn't know his military status, and he was released six months later. He established himself as a merchant at Lingayen, got in touch with the Filipino guerrillas in the hills and worked with them right under the Japs' noses.

Reporting for duty

Lt. Rafael N. Diaz (right), also a member of the 10th Bomb Group, was on Mindanao when the Japs invaded that southern Philippine island. He escaped and after fighting with the guerrillas for seven months, made his way back to Luzon, where he joined Lieutenant Rico in his Jap-sabotaging activities.

On the day after our troops landed on Luzon, both lieutenants reported for duty to the engineer in charge at Lingayen and went to work on the airstrip.

The mess hall sign over the doorway weathered the entire Jap occupation and dates back to before the war when the Lingayen strip was an AAF training field.

Shot from the Sky

More than seven million Americans have now seen the traveling exhibit of captured enemy aerial equipment presented throughout the United States by the Army Air Forces. How much the home folks have been impressed can be surmised from the record of 32,000 persons who have signed up for war jobs either at the exhibit or as a direct result of it.

10,000 pieces—10,000

The 23-acre exhibit of enemy planes and equipment, called "Shot From the Sky," has had an additional value in reducing absenteeism and labor-turnover and is credited with improving industrial morale in areas where it has been shown.

The 10,000 pieces of Axis equipment, making up the exhibit, is carried in Army trucks, vans and trailers which have been retired from combat service. There are 60 enlisted men working with the show, nearly all of whom are veterans of overseas service, representing every combat Air Force. Assisting the men are 43 Wacs who travel with the exhibit. Five officers are in charge of "Shot From The Sky."

Lifeline Pioneers

A letter from Col. Julius A. Kolb, Chief of Staff, Hq., 51st Troop Carrier Wing, fills us in on some interesting background material on the Northwestern ferrying route, described in "Lifeline to the USSR" (AIR FORCE, November 1944).

As group operations officer of the 62nd Group, Colonel Kolb in September 1941 was directed to make a flight to Fairbanks, Alaska, surveying prospective sites along the way for stops on a supply ferrying route from Dayton. With three other pilots, a crew chief and a radio operator, Colonel Kolb made the flight in a C-39, starting from Sacramento and going by way of Tacoma, Seattle, Spokane, Edmonton, Grande Prairie, Fort Nelson, Watson Lake and Whitehorse. They were en route six days.

They found landing fields of some sort at all these places, but radio ranges were only in process of installation. Canadian authorities and operators of commercial lines were interviewed, and a report made to Dayton and Washington outlining existing facilities and dates for the completion of additional fields and radio facilities. During February, March and April of 1942, the 62nd Group operated a C-53 from Edmonton to Fairbanks, linking up with a 10th Group C-53 which made the run from Dayton to Edmonton. It was during this period that the first B-26s and P-40s, winterized at Sacramento, were flown northwest to Fairbanks.

Thus Colonel Kolb and his men are entitled to an honored place among the pioneers of flying in this area (among whom are General of the Army H. H. Arnold, who led a mass flight from Washington to Fairbanks in 1934; Maj. Gen. Ralph Royce, who conducted pre-war surveys of the same territory; and the many commercial and bush-pilots who added their experience to the total). When war necessity dictated mass delivery of planes to Alaska in the summer of 1942, as described in "Lifeline to the USSR," a groundwork had already been laid by the 62nd Group.

Service Flags

The War Department recently issued a circular which designates the proper position of stars and service insignia in the official service flag authorized for display by individuals and organizations. Where a service flag bears both a blue star and gold star, the gold star will be above the blue star, when the flag is displayed in a vertical position, and at the left when displayed in horizontal position.

Where a design of the service lapel-button, issued to discharged veterans of World War II, is included in the service flag, this will be located below the blue star when the flag is vertical, and at the right when horizontal.

Doing A Job

Every now and then you hear those vicious little stories about how different branches of the Army do not get along, how they indulge in intra-service jealousies at the expense of combat efficiency. Almost traditionally these yarns concern the Infantry and the Air Force.

From Lt. Jack Fern, public relations officer of the 7th Air Force Fighter Command, comes a far better and more accurate story concerning the AAF and the Infantry. It happened in the Marianas. Three P-47s came back from dive bombing Pagan with ragged holes through wings and fuselages, put there by sharp-shooting Jap antiaircraft fire. A mechanic had just stepped back from examining one of the planes when a small infantry soldier asked, "Did they all get back OK?" The infantryman, unnoticed until then, said he had just come down from the fighting front in the hills of Saipan. He was dirty and tired, and his face was lined with the strain he had been through.

"Yes," the mechanic said, "They all got through." The infantryman nodded his head, "That's fine," he answered. "We can't spare those guys, they're really doing a job." With that he turned and walked on down the road—a little guy in dirty clothes and a battered tin hat, carrying a clean, well-oiled rifle.

As he walked away one of the fighter pilots who had overheard the conversation stared after him. "Did you hear that?" he asked. "Him worrying about us! I wouldn't changes places with that guy, go through what he's going through, for all the tea in China."

In the Spring

It may be just as well at this time to eliminate an erroneous impression now making the rounds—that every soldier wants nothing better in the postwar world than to gambol around the countryside in a jeep.

Airminded drivers of the 7th Air Force have used the jeep for everything in the line of transporting men and materials, but when anyone gets sentimental over the little car, they merely rub their nether ends and look woeful. Take the case of a driver in the Gilbert Islands. In a seven months' period he drove his jeep 10,000 miles on an atoll that measures only five miles from end to end. He was grounded for a rest recently when he was seen at dinner putting his fork in second gear while shifting from spam to

TRAINING AIDS

Newly Standardized for Field Use

FILMS

(Note: Refer to AAF Letter 20-83, "Distribution of Motion Picture Film Within Continental United States," 26 March 1945, for new film distribution policy.

TF 1-3433, 50-Hour Inspection of B-29, Part II—Wing, landing gear, hydraulic system and empennage. Running time: one hour.

TF 1-3434, 50-Hour Inspection of B-29, Part III—Electrical system. Running time: 30 minutes.

TF 1-3470, Fluid Flow in Hydraulic System—Basic laws of fluids for aircraft mechanic students. Running time: 10 minutes.

TF 1-3671, Aircraft Magneto, Part II, Theory and Operation of Eight-Pole—For basic aircraft mechanic students and electrical specialists. Running time: 10 minutes.

FS 1-2136, SCR-718, High Altitude Altimeter—Theory and operation.

FS 1-2141, B-29 Airplane Modifications: Fuel Flowmeter Type B-3A—First of series of important modifications presented in film strips.

FS 1-2154, A-17 Turret: Mechanical Principles of Operation.

AFFS 1250 through 1270, Line Maintenance and Servicing of V-1650-3-7 Engines.

DEVICES

Mockup Trainer, Type O-58 (Radial Engine)—For classroom instruction in basic principles and operation of a nine-cylinder Wright Whirlwind; consists of manually operated animated cross-section of engine.

PUBLICATIONS

Objective Briefing Folder (AF Manual No. 61)—To be used with projection-type Bombing Trainers, Types A-5, A-6 and A-7; gives complete picture of bombing problems, including pilotage, D/R, target identification and bombing run.

For Your Hide's Sake, Prevent Burns (AF Manual No. 48—Lessons on how many aircraft burns can be prevented by wearing proper flying clothing.

The Airplane Commander (AF Manual No. 65)—Sound, hard advice on how plane commander can weld combat crew into a team that has a better chance of returning home.

Syllabus of Basic Problems for the A-5 Bombing and D/R Trainer—Eight work-sheet problems containing data for teacher and pupil.

GRAPHICS

Cardboard Three-Dimensional Weather Maps—"Pop-up" graphics devices, three to a set, for basic weather training of aircrews. Consists of (1) Early Stages of Development, (2) Cold Type Occlusion and (3) Warm Front Type Occlusion, each of the three a stage in a typical cyclonic storm.

Ditching Posters (A-26, B-17 and B-24)—Thorough, standardized procedure for each plane, with specific directions for each crew member.

Calendar Chemical Warfare Posters—Latest four of the eye-catching series, covering March, April, May and June.

Caliber .50 Browning Machine Gun—Poster binder of 34 sheets illustrating, by cutaway and sectional diagram, the gun at work, the seven groups and cycle of operation. For classroom use in conjunction with G. I. F.

B-29 Fields of Fire and Fields of Search—Four posters, each of which reveals fields of fire and search for one of the four sighting stations. For classroom use in conjunction with "Gunnery in the B-29" (AF Manual No. 27.)

RECOGNITION

Recognition Instructors Information Letters, No. 13 and 14—Of general interest to AAF activities. Letter 13 consists of data sheets on all operationally important Allied and enemy aircraft; Letter 14, data sheets on Allied and enemy tanks. Limited number of extra copies available.

Merchant Vessel Models—Sixteen types, in either miniature or teacher-type sizes. Initial distribution already made on basis of requirements submitted by respective air force and command headquarters.

Information on the availability of training aids listed in this column, unless otherwise indicated, may be obtained from the chief, Training Aids Division, Army Air Forces, One Park Avenue, New York 16, N. Y., upon request through channels.

bread pudding. Have a jeep after the war. . . . Well, some soldiers will want them. But the majority have expressed a preference for something with springs. Many more, and much softer springs.

New Full Generals

Three veteran air officers were among the nine Army lieutenant generals recently advanced to the grade of full general. They are General Joseph T. McNarney, Deputy Supreme Allied Commander in the Mediterranean theater, and former Deputy Chief of Staff of the War Department General Staff; General Carl Spaatz, commanding the United States Strategic Air Forces in Europe; and General George C. Kenney, commanding the Far East Air Forces.

Into the Fire

When a pilot bails out, he can usually discount his plane as a hazard to landing once his parachute opens and everything is proceeding well. This was not true for a flight officer who had to jump at 500 feet when both engines failed near Chico Army Air Field. At 500 feet a pilot has no time for sober consideration, so this flyer did the correct thing and jumped. His chute opened at about 100 feet and he drifted down—into the wreckage of his burning airplane. Fortunately the mishap had been seen from the Chico tower and an ambulance, crash truck and radio jeep were dispatched to pull the pilot from the fire. He was rescued and was in the base hospital 17 minutes after he bailed out.

Battle Honors

Since the last list of Battle Honors published in April Air Force, announcement has been made of the award of the Distinguished Unit Citation to several additional AAF units. The units, dates of actions and a brief summary of the citation as printed in General Orders of the War Department include:

March 4, 6 and 8, 1944

100th Bombardment Group (H)

Carried out its assigned mission of attacking the enemy capital of Berlin on each of the dates mentioned above, despite adverse weather conditions and the concentrated defenses of a powerful foe. In the final attack, on March 8, a telling blow was delivered to factories producing one-half the ball-bearings required by the Luftwaffe.

355th Fighter Group April 5, 1944

Located an airdrome deep in Germany after an hour and a half instrument flight necessitated by a heavy undercast and attacked the planes deployed there. In an attack lasting more than forty minutes, the group made repeated passes to destroy 51 planes on the ground and in the air, and heavily damaged another 81.

456th Bombardment Group (H) May 10, 1944

Attacked an aircraft plant at Wiener Neustadt, Austria, despite severe weather conditions and heavy enemy opposition. Though the lead plane was hit by flak and compelled to feather two engines, the pilot

persisted in his bombing run and led an attack that virtually obliterated the target.

82nd Fighter Group June 10, 1944

Executed the longest fighter-bomber mission till then undertaken in the Mediterranean Theater of Operations, against the Romano Americano Oil Refinery at Ploesti. Substantial damage was inflicted on the boiler house and other vital installations despite intense flak and dense smoke screening the target. During the return flight, planes of the group destroyed 11 locomotives, strafed 12 trains, shot down 5 enemy planes and destroyed 7 on the ground.

367th Fighter Group Aug. 25, 1944

Accomplished two missions against enemy landing grounds in France on the above date. After completing the first series of attacks (at Clastres, Peronne and Rosieries) the group encountered a flight of enemy planes and destroyed 25 of them in a lengthy encounter. In the afternoon, the group made an 860 mile fighter sweep (against fields at Cognac, Bourges and Dijon), destroying 16 parked planes.

Aug. 28, 1944

Third Photographic Group, Reconnaissance

Contributed in great degree to the rapid advance of our ground forces against a determined enemy by overcoming extremely difficult conditions to photograph desired area. All personnel collaborated on a twenty-four hour basis to prepare planes for flight, obtain photographs, process and interpret them and convey the material thus gathered to headquarters.

406th Fighter Group September 7, 1944

Located an enemy column in the vicinity of Chateauroux, France as it was attempting to flee through the Belfort Gap and severely mauled its personnel, transport and armored vehicles, destroying 300 military carriers of all sorts. Having expended its ammunition and left the road blocked for 15 miles, the group returned to base, rearmed and refueled in a minimum of time and returned to destroy an additional 187 vehicles, including 25 ammunition carriers.

"Gosh, they don't forget a thing on these emergency landing rafts, do they?"

AAF Radio Show

The AAF has assigned combat radio reporter team to fighter and bomber squadrons operating over Germany and Japan to record first hand accounts of aerial warfare. From this material the Blue Network will broadcast a program each Saturday from 1:30 to 2 p. m., Eastern War Time, and the Armed Forces Radio Service will shortwave it to fighting men all over the world.

Material recorded on actual missions will be brought to New York by plane and delivered to Station WJZ for broadcasting. From time to time the progress of air battles in various theaters of operations will be reported by top rank generals of the AAF. General Arnold or a member of his staff, speaking from Washington, will bring a weekly report from the War Department. The program for the AAF is supervised by Maj. Frederick Brisson. Music will be provided by the AAF orchestra and soldier chorus. T/Sgt. Warren Lewis will write the script of the show.

Changes in Command

Maj. Gen. Ralph Royce, from commander of the First Tactical Air Force (Provisional) to commander of the Personnel Distribution Command.

Maj. Gen. Robert M. Webster, from deputy commander, 12th Air Force, to commander of the 1st Tactical Air Force (Provisional).

Brig. Gen. Paul B. Wurtsmith, from commander of the Fifth Fighter Command to commander of the 13th Air Force.

Brig. Gen. Eugene H. Beebe, to assistant to the Commanding General, Army Air Forces.

Brig. Gen. John F. McBlain, from commander of the 3rd Tactical Air Command

PARACHUTES LOST

38- 10381	42-151928I	42-202748A
42- 4180F	42-162099D	42-210115I
42- 47096I	42-196159B	42-227363G
42- 8097E	42-196160B	42-471750H
42- 9258B	42-196163B	42-649724I
42-104293C	42-196165B	42-649777I
42-106208C	42-196170B	42-649790I

Return to field indicated by letter after number as keyed below

A—Barksdale Field, La.
B—Lake Charles Army Air Field, Lake Charles, La.
C—Louisville Modification Center Control Office, Ferrying Division, ATC, Consolidated-Vultee, Louisville, Ky.
D—Yuma Army Air Field, Yuma, Ariz.
E—Gunter Field, Montgomery, Ala.
F—Moody Field, Valdosta, Ga.
G—Muskogee Army Air Field, Muskogee, Okla.
H—Ogden Air Technical Service Command, Hill Field, Ogden, Utah
I—Lockbourne Army Air Base, Columbus 17, Ohio

HOW SHARP ARE YOU?

QUESTIONS

In answering these questions, count the plane nearest you as number one.

1. Which plane is lagging behind the others?
2. How many wing tanks are visible on the first two planes?
3. What type fighter is the fourth plane?
4. Which plane has a name and what is it?
5. What letters appear on the fourth plane?
6. What parts of the first plane are checkered?
7. Which plane has a letter on its tail and what is it?
8. What letters appear on the side of the fuselage of the third plane?
9. How many AAF insignia are visible in the photo?
10. The first plane has a black band around its nose. True or false.

ANSWERS ON PAGE 57

to Chief of Staff of the Eastern Flying Training Command.

Brig. Gen. Hume Peabody, from director of post-hostilities planning, USSTAF, to commander of Eastern Flying Training Command.

Keep Gloves On

During combat at extremely high altitude an excited gunner may remove a glove in spite of the intense cold to work on a jammed gun. Frostbite is the inevitable consequence, and he may be hospitalized for months and crippled for life.

The cause and effect of such frostbite is vividly shown in a new full color poster produced by Training Aids Division in cooperation with the Air Surgeon, the Aero Medical Laboratory and the 8th Air Force.

The poster test states that practice in clearing a gun with gloved hands while on the ground will eliminate the need to take off gloves while in high altitude combat. ☆

AIR FORCE Now Available by Subscription

Because of the many requests for personal copies of AIR FORCE, the official service journal now is available by subscription. The present system of bulk distribution to all AAF units, which provides that each copy of AIR FORCE be shared with several readers, will be continued without change. In addition, you now can receive personal copies of AIR FORCE at your Army address or have them sent to your home. The personal copies may be obtained by writing direct to the Superintendent of Documents, Government Printing Office, Washington 25, D. C. The subscription rate for 12 monthly issues is $2.00; single copies, 20c. The same rates apply to APO or Fleet Post Office addresses. Remittances must accompany all orders.

AAF QUIZ

WHAT'S YOUR AIR FORCE I.Q.?

Here is your monthly brain-twister. Chalk up five points for each correct answer. A score of 90 or above is excellent; 75 to 85, good; 60 to 70, not too bad; below 60, tsk, tsk. Answers on Page 60.

1. The AAF guarantees that returnees will be given station assignments near their homes.
A. *True* B. *False*

2. Stalag Luft is German name for
A. *Basic training station for pilots*
B. *Supreme War Council*
E. *A senior pilot*
D. *Prisoner of war camp for airmen*

3. You would find a rhumb line on a
A. *Astrodome*
B. *Weather map*
C. *B-17 instrument panel*
D. *B-29 nose wheel*

4. Wideawake Field is located
A. *On Ascension Island*
B. *At Sleepy Hollow, N. Y.*
C. *Near Orlando, Fla.*
D. *In the Philippines*

5. The American 120 mm antiaircraft gun weighs approximately:
A. *Two tons* C. *31 tons*
B. *Three tons* D. *12 tons*

6. Whenever possible, you should make a parachute landing with your back to the wind.
A. *True* B. *False*

7. Approximately how many islands make up the Philippines?
A. *27* B. *7,000* C. *4,500* D. *225*

8. Japanese paratroops were dropped on 5th Air Force installations on Leyte last December by
A. *Dinahs* D. *Zekes*
B. *Nicks* C. *Topsys*

9. Distinguished Unit Citation is the name of an award made
A. *Only to Army units*
B. *To both Navy and Army units*
C. *Only to AAF units*
D. *Only to Navy units*

10. Name the only AAF three-place fighter plane in combat service.

11. The Aeronautical Board is
A. *The AAF committee which passes on aeronautical ratings.*
B. *The AAF's chief testing organization at Eglin Field*
C. *A joint board to effect cooperation between the Army and Navy in the development of aviation.*
D. *The civilian research committee of the Association of Aircraft Manufacturers.*

12. Normal gravity force on the human body is expressed as
A. *GF* B. *Plus 1G* C. *Plus 2G* D. *GI*

13. On what island is Tokyo located
A. *Shikoku* C. *Hokkaido*
B. *Kyushu* D. *Honshu*

14. The name popularly given to the P-80 is the
A. *Airacomet* C. *Shooting Star*
B. *Airflare* D. *Ascender*

15. Headquarters, 14th Air Force is located at
A. *Hengyang* C. *Chungking*
B. *Kunming* D. *Lashio*

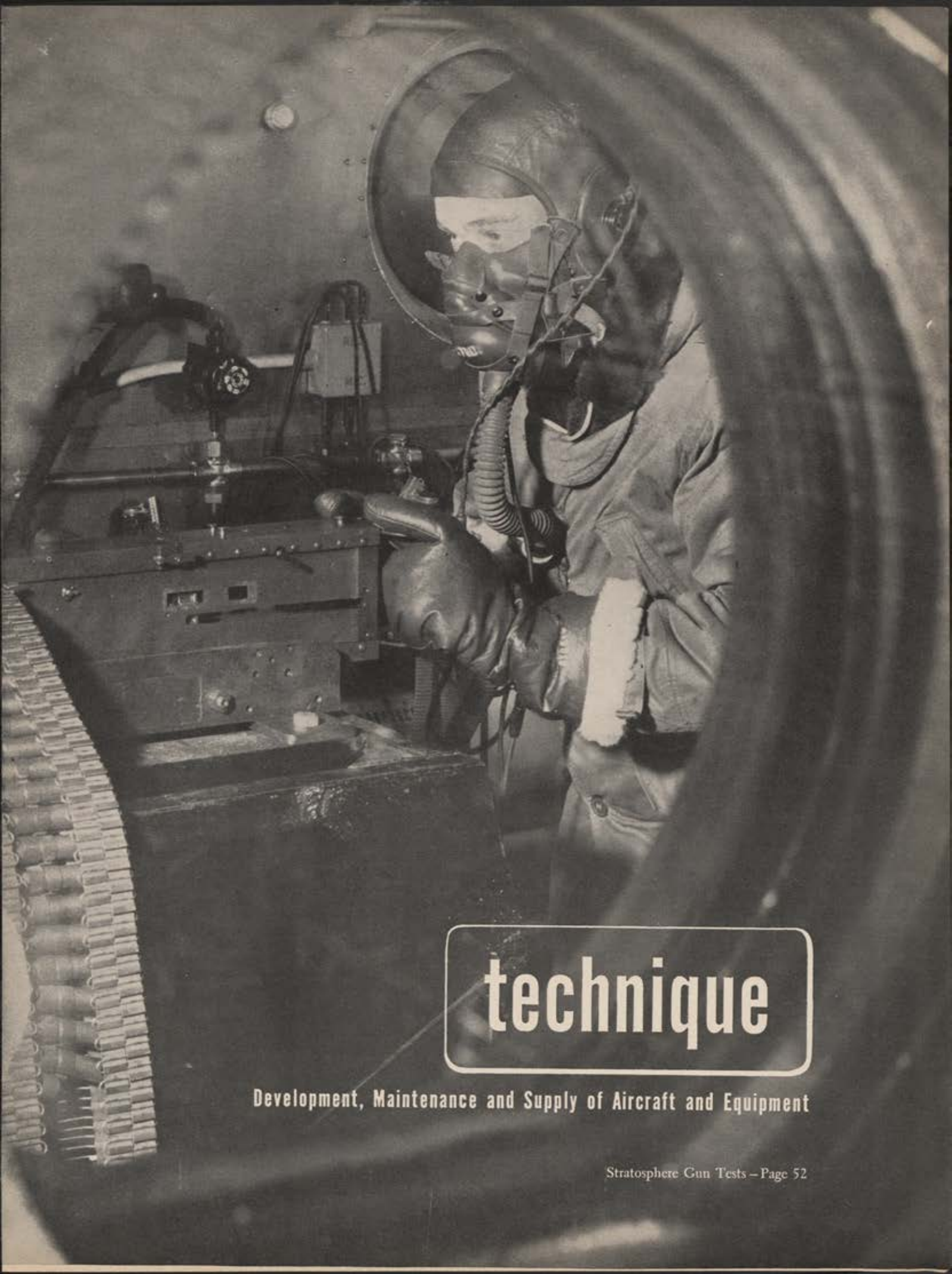
16. The Jap Nick is a
A. *Single-engine single-place fighter*
B. *Twin-engine single-place fighter*
C. *Twin-engine twin-place bomber*
D. *Twin-engine twin-place fighter*

17. "Synoptic climatology" refers to
A. *Medical research on improved methods of vision*
B. *A method of determining the altitude of mountains*
C. *Weather investigation and forecasting*
D. *The effects of rain upon the soil*

8. Initials AACS refer to what?

9. Approximately what is the higest altitude ever reached by man?
A. *72,000 feet* C. *61,000 feet*
B. *100,000 feet* D. *58,000 feet*

20. Which of the P-47s below is the newer model? ↓



technique

Development, Maintenance and Supply of Aircraft and Equipment

Stratosphere Gun Tests – Page 52

Training plane with fixed landing gear.

With skis mounted on its landing gear (shown retracted) a C47 can land in snow.

Wheels fold into fuselage on XO-52.

Landing Gear Developments

Because landing gear is dead weight when a plane is in flight, designers have concentrated on light and simple undercarriage installations. To eliminate drag they have devised various methods of covering them with "spats" and "pants" and retracting the gear into wings, nacelles and fuselages. Even the 96-inch diameter wheels of the XB-19, weighing 2,700 lbs. each, are retracted hydraulically into huge wing wells.

However, designers have tried to shy away from large wheels because of production difficulties. In the B-29 and C-54, dual-wheel installation are used. This permits use of two small wheels on each landing strut instead of one large wheel. On the Superfort, wheel diameter is the same as on the B-17. Other experimental installations include a large float-wheel gear for the C-47, seaplane floats for all light planes, ski installations on conventional gear and use of tractor treads on an A-20.

The next step may see the elimination on some planes of ordinary landing gear, and such aircraft may skid across sod fields on flattened bellies and special sled-nosed nacelles. Most early planes had fixed landing gear, and the fuselage was practically on stilts to keep the nose high enough for propeller clearance. But with the elimination of propellers on jet-propelled planes, such considerations will not necessarily apply.

An early attempt at wheel retraction was on a Dayton-Wright Racer in 1918. The pilot cranked the wheels up by hand and drag was greatly reduced. Wheel spats and pants which put wheels in streamlined cowlings to cut down resistance were the fad in the Lindbergh era, but mechanical systems of retraction were a progressive step forward. These methods grew in importance as airplanes were cleaned up aerodynamically and landing gear drag became more and more a detriment to speed and performance. When the gear of a B-29 is down, for example, it means a 50 mph differential at 30,000 feet. The C-46 at sea level loses 35 mph when its gear is lowered, and the P-38 sacrifices as much as 100 mph with gear extended. The most important problem in flight with gear retracted is the dead weight that must

This P-39F has tricycle landing wheels.

be carried, and the space that is sacrificed to house wheels and retracting mechanisms in the wing or fuselage.

Depending on the configuration of the airplane, retracting methods differ. Two systems are in predominant use—hydraulic and electro-mechanical. Comparative weights of these systems vary according to the airplane on which they are used. The B-17 electrical system weighs about 290 lbs. less than the hydraulic system of the B-24, but both raise and lower the gear in about the same length of time—40 seconds to lift the wheels and 30 seconds to lower them.

Just where the wheels go, how they pull up and tuck away, also depends on specific airplane designs. The B-17 and the B-29 have large inboard nacelles so wheels retract into them with a knee-action. On the B-24, the wheels fold flaplike into deep wells in the wing's thick center section. Because of thin airfoil sections on fighter planes, wheels must be folded flat into the wings.

Finding a place to "hide" a nose-wheel in single-engine airplanes held back development of the tricycle landing gear, which has definite advantages over conventional types. It puts the nose of the airplane closer to the ground, permitting better pilot vision, improves steerability and tends to stabilize the plane against ground-looping.

Both tricycle and earlier-type retractable gear use hydraulic braking systems which will stop our heaviest planes after a landing run of one-third mile. On planes larger than the B-29, shock absorbers will be called upon to withstand impact loads of 300,000 lbs.

Oxygen Under Water

One day last Fall, Capt. W. C. Kulesz of Wright Field's Aero-Medical Laboratory clamped on a standard A-14 oxygen mask, tucked the small walk-around bottle under his arm and completely submerged himself in the officers' swimming pool at Patterson Field. Because of water pressure, the mask sealed tightly to his face to prevent leakage and he was able to stay under at a depth of four feet for five minutes, breathing normally with no ill effects.

The point Captain Kulesz successfully demonstrated was that ordinary demand-type oxygen equipment could be used in exceptional emergencies to save airmen's lives when planes are submerged in ditch landings and do not sink too far below the surface. In a subsequent test, a mock-up wooden fuselage section of a B-24, complete with escape hatches, was dunked in a

tech topics . . . about aircraft and equipment

A jettisonable plastic cover that fits over B-29 sighting blisters keeps off mud and dirt during take-offs from wet fields. Gunners no longer need look through splotched sighting windows which hindered visibility. The guards also serve to prevent heat distortion when the plane is on the ground in extremely hot climates.

To aid in air evacuation, the CG-4A gliders may be fitted with removable litter installations. Similar litters also may be built in CG-15 gliders.

Recently, a pilot flying the P-59 during a heavy rain squall, reported he got "automatic water injection" in the jet engines. Now, experiments are under way to see if a simple sprinkler system can't be used to increase the power of the Airacomet.

Latest B-17s have enlarged life raft compartments which permit stowage of emergency accessories with the rubber boat instead of separately in the radio compartment. Formerly, the much-needed accessories, which were not ejected simultaneously with the raft, were lost when the fuselage sank. Now the emergency accessories pop out when the raft is released.

During 1944, ATSC's Engineering Division released to standard 480 items, ranging from complete airplanes to a pair of heated goggles. This year, the division is engaged in more than 2,000 different projects.

To make it more comfortable for airborne wounded returning to domestic care, a perfumed deodorant is being tested to rid evacuation planes of their "hospital smell."

Reports from the South Pacific show that long-range fighter pilots are suffering from high temperatures in cockpits due to solar radiation. As a result, plexiglas canopies are being rendered opaque to ultra-violet and infra-red rays. New light-weight clothing and helmets—some made of highly porous fabrics—are also being tested.

Design of a "replaceable nose" for one of our latest and fastest fighter planes permits the plane to be converted into a high-altitude reconnaissance plane in a matter of minutes. Simply by removing four bolts and several electrical fittings, the nose with the guns is replaced by the nose with the cameras.

AAF personnel in far-off places will get their ice cream rations, now that 600 portable-by-air ice cream making machines are on their way overseas. Knock-down soda fountains that can be carried by a C-47 are the next step.

The XR-6 helicopter is now being used as an aerial delivery aircraft. All-wood blades on this craft are now under test at Wright Field, which may eliminate dangers and serious effects caused by hailstones and heavy rain against present fabric-covered rotors.

A quick-packing 18-foot rayon cargo parachute has been designed for dropping supplies in the CBI area. It folds into a 10-inch square, one-piece pack and permits dropping cargo packages weighing up to 200 pounds.

Special bomb-racks in Superforts now permit carrying triple the load of 100-lb. bombs of any AAF bomber. Other armament improvements in heavy bombers include new dual-gun mounts which permit use of the latest K-13 sight, which gives a gunner more automatic aiming devices.

Latest type superchargers have increased the ceiling of P-47s and P-61s by more than 5,000 feet. These same "breathers" on the B-29 will increase its ceiling and cruising range proportionately.

A pulsating seat cushion that "massages" the derriére of seated pilots has been suggested as a comforting aid for flyers on long-range fighter missions. Mittens made of coarse mesh are under test for crewmen who must work in cold climates, since they permit easy grasp of cold objects.

The latest flak helmet has hinged ear-flaps which give protection to a greater area of the head. Helmet is made of .050-inch steel covered with leather padding.

To train aircrews in proper escape techniques under high G forces which occur during spinning, a wood fuselage section with escape hatches has been built on one end of the centrifuge at Wright Field. Whirling to get the simulated spin forces, the trainees are conditioned gradually to the effects of crawling through the hatches.

With standard oxygen mask, and walk-around bottle under arm, airman may breathe under water during emergency ditching.

nearby lake. The six-man crew—Captain Kulesz and five enlisted men—were seated in their proper positions for ditching, and only underwater escape was possible for the individuals in the waist section. With their masks on, they found breathing possible, and felt their way through the water-filled fuselage and climbed to the surface.

Sometime later, AAF flight engineers in experiments at the Navy Yard diving pool, Washington, found that with the A-14 demand mask, the A-13 oxygen regulator and the D-2 walk-around cylinder, a man could stay under water for six minutes in ten feet, for five minutes in 20-25 feet and for 3½ minutes at a depth of 50 feet.

As indicated, the duration of the oxygen supply is affected by water depth, decreasing proportionately as depth is increased. This means that although efficiency of the oxygen equipment under water may be relied on, it is no less important to escape from ditched aircraft in the greatest possible hurry, and aircrews must still be proficient in getting out within a very few seconds. In moving about, extreme care must be taken not to let the hose of the mask catch on trappings in the plane, and because the low-pressure oxygen bottle has enough buoyancy to keep a man afloat, structural members of the plane should be gripped to prevent heads from being cracked against the top of the fuselage.

A small sling that fits over the shoulder like a Sam Browne belt can be used to hold the oxygen bottle under the user's armpit so it is somewhat out of the way, while two waist straps from the sling secure the cylinder so it will not come loose. When held at a level lower than the face mask, the regulator provides a continuous flow of oxygen, and automatically feeds proper quantities in the same manner as when used at high altitudes.

A new walk-around assembly, installed in production aircraft as of April, 1945, consists of an A-15 diluter demand regulator and an A-6 cylinder, which may be utilized for underwater emergencies by holding the palm of the hand over the air diluter. Though some water may enter the regulator through this port, the quantity will not be sufficient to prevent the assembly's use during the first critical few minutes. Action, however, is being taken by the Aero Medical Laboratory to eliminate such leakage, as well as to provide a greater flow of oxygen, since at present the oxygen metering port in the regulator is controlled by an aneroid and is partially closed at ground level.

If walk-around cylinders are not available, standard type A-12 and AN 6004-1 diluter demand regulators installed in the airplane may be used. With the diluter control turned to the "off" (100 percent oxygen) position and the emergency valve open, the submerged man is supplied with enough oxygen to permit him to release other equipment and move to the nearest hatch. He then can effect an escape by holding his breath and disconnecting from the oxygen supply, a method that lends itself well for fighters.

Aerial Wire Layer

Flying low over the rugged Great Smoky mountain region in Tennessee last October, a C-47 laid a two-way, 16-mile long telephone line in less than seven minutes. A ground unit, using standard wire-laying equipment over the same difficult terrain, would have required three weeks.

Within two and one-half minutes after the C-47 began its wire-laying run, men in the plane were talking to ground personnel through ordinary field telephone sets. Four minutes later, when the last of the wire had been laid, a ground patrol began cutting in on the line and was in immediate communication with its headquarters 16 miles away.

Although tests are still being made, it is likely that the AAF will soon be laying telephone wires on top of jungle roofs or stringing them between mountains high above valley floors where the vital cables would be extremely difficult for enemy wire-cutting patrols to see or reach. In airborne operations, similar to the Wingate-Cochran occupation of northern Burma airstrips last year, airplanes may be able to link together, by telephone, all advanced units with their headquarters almost immediately after initial landings.

The installation used on the C-47 weighs about 3,500 pounds and is known as the Center-Guide Wire-Laying System. It consists of a series of box-like containers each of which holds more than 5,000 feet of coiled wire. A three-foot standard pilot chute drags the wire out of its containers and a 20-pound chain weight on the end of

Telephone line laid by air over rugged terrain speeds communication between advance units and headquarters in ground fighting. At right, man prepares to drop plummet chain which will start wire through cargo door guide tube at the rate of 220 feet per second.

the wire makes it plummet straight to the ground. A long tube, eight inches in diameter, guides the wire from the containers through the cargo door, preventing tangling and looping inside the fuselage. This apparatus, which unravels the cable like a ball of twine at an average rate of 220 feet per second, was developed by engineers of ATSC Equipment Laboratory and Bell Telephone Labs after extensive tests.

Another wire-laying system, developed jointly by the AAF and the Signal Corps, makes use of a series of lightweight high-speed coils in a container-dispenser mounted under each wing of an L-5, and permits two double-wire circuits up to five miles long each, to be laid simultaneously.

Bomb Fuzing in Philippines

The battle of the Philippine Islands has been fought largely with two bombs—the parafrag and parademo. In adapting these bombs to the low level style of bombing favored by tactical units of the 5th Air Force, it was necessary to lower the arming time of the fuze from 2½ seconds to 1½ seconds, permitting bombing from 60 feet.

Clock mechanism of M-120 nose fuze on parachute bomb, with a key lock device made in field.

Since factory modifications were not available, ordnance units of the 5th Air Force Service Command were assigned the task of modifying these fuzes in the field by hand. Production-line methods were put into effect and the work proceeded on an around - the - clock basis. In the two-day period prior to the mass air strikes which preceded the Lingayen landings, 10,000 fuzes were produced in the Leyte area alone. One unit modified nearly 50,000 fuzes in 21 days, using three 9-man shifts.

After the modification, timing mechanism is reinserted in the fuze case for bombing.

Chrome Plating for Cylinders

A new chrome plating process at AAF depots increases cylinder life more than 100 percent and eliminates supply and installation problems encountered when oversize pistons and cylinders must be used for overhauled engines. By this means, cylinders headed

maintenance tips . . .

from the crew chief's stand

While plenty potent in the air, the P-47N needs special care when it's down to earth. As mentioned in last month's Technique, tires are slightly larger than those on previous Thunderbolt models, being 34 x 9.9. If tires having nylon fabric are used, all wing tanks can be filled, but if rayon is employed wing tanks must not be filled because of the extra stretch under the greater weight. And watch the clearance between the down lock arm on the landing gear strut and the shim block against which it comes to rest—too little clearance can crack off the arm when the gear is extended. Also, with new type "E" struts, the down latch timing valve is eliminated, and the latch is withdrawn simultaneously with gear retraction. Too little clearance can jam the latch and keep the gear down.

Another sky scourge that requires a little more coddling on the ground, is the A-26. When leading it by the nose via tractor and tow bar, be sure to push the snubber locking pin all the way back to disengage it from the locking notch and allow full turning of the nose wheel. Then, too, make sure the nose strut isn't over-inflated, as this may result in undue wear on the cam and follower. Forgetting to do this will mean one sheared pin after another.

Although the wing skin is stronger on this plane than on the old A-20, the

smoothly finished laminar flow wing is far more sensitive to damage or change in contour—so go easy with your size elevens and with the gas hose.

Excessive ring cowl failure on B-25Js is to be remedied in production, but the condition will have to be corrected in current service models. The modification consists of a stainless steel ring in the cowl leading edge to pick up the foremost rivets of the cowl attaching brackets, which are also to be reinforced with stainless steel angles. A Tech Order will be issued soon to include drawings and procedure.

The engine-to-cowl link assembly has also been changed in production to incorporate a case-hardened bushing and a chrome-plated spacer. All brackets joining links to rocker boxes are to be held to a tolerance of plus 1/32" and minus .000" between inside faces of channel sections. Pending delivery of new assemblies, it is recommended that old spacers be replaced with flanged bushings of rod-oilite bronze, or Z4130 chrome molybdenum. Since no TO will be issued, see sketch in UR Digest 00-65-24, page 21AC.

The enemy won't suffer from lead poisoning if you slosh oil around machine guns while the G-9 solenoid is in place, thus causing congealing and failure to fire at high altitudes and low temperatures. One of the most widely used electrical items

in armament, the G-9 is thoroughly reliable if kept clean—yet there were 538 failures reported in a two-week period because units had been cleaning and oiling gun receivers in the shop without first removing solenoids. In some installations, as with the tilted gun in P-51 wings, the solenoid lies underneath the receiver, where special care must be taken to keep oil out of the interior. For proper cleaning procedure, see TO 00-65-2.

Malfunctioning of bomb doors on B-17s has nearly always been due to improper adjustment of door limit switches. When limits are not sufficient to allow for overtravel on the retracting screws at full open and closed positions, too great a strain is set up on the bomb door shaft, causing breakage. The shaft in question (Part No. 43-785-401) is being made stronger in production, but can be beefed up in the field by pressing on a steel sleeve, 1-inch long, 1/16-inch wall thickness, machined for a snug fit and heat-treated to withstand 150,000 lbs. per square inch.

Say "Ah," to a practical suggestion from M/Sgt. Louis Stephenson, 12th Air Force, who found that by using a doctor's applicator or swab stick he could cure small screws of recalcitrant tendencies when they are started in inaccessible places. Trim the end to fit tightly into the screw head slot, start the screw in and then pull the stick away. The same trick can be applied on removal, preserving fingers, screws and pleasant dispositions.

for salvage are electro-plated with porous chromium and are then honed to original specification tolerances. In this way they are able to last for three or four more overhaul periods.

Originally adopted for Lycoming R-680 cylinders, which have relatively soft steel cylinder walls, and Wright R-1820s, which have nitrided barrels that cannot be honed to oversize, the process proved so successful that its use has been extended to Wright R-2600s and P&W R-985s, R-1340s, and R-1830s. More than 4,000 engines of these types have been assembled with plated cylinders at domestic overhaul bases and cylinders now are being plated at a rate approximating 10,000 per month.

The method was developed jointly by engineers of the Maintenance Division and Power Plant Laboratory of ATSC, and was first used in November, 1943 to reclaim worn-out cylinders. At present, chrome-plating is standard procedure at San Antonio's overhaul depot and at many shops doing contract work for the AAF. As additional facilities are made available, and as chromium supplies are increased, the plating process probably will be adopted at all overhaul depots.

When engines with chrome-plated cylinders are sent to depots for subsequent overhauls, personnel should be cautioned not to hone the cylinders and not to use chromium rings, since stock rings are satisfactory.

B-19 has exceeded speeds of 250 mph and performed satisfactorily at altitudes up to 25,000 feet.

B-19 Cargo Carrier

Although the huge XB-19A has never dropped a bomb on enemy territory or fired a gun in combat, it has contributed much to the war effort by providing important engineering and flight data for big bombers, and at present is entering a new phase of its military career as the largest cargo carrying airplane in the world.

Characteristics include a wingspread of 212 feet and a fuselage 132 feet long. From the ground to the top of its tail it is 42 feet high, and the two main landing wheels are eight feet in diameter. Now powered with four liquid-cooled Allison V-3420 in-line engines, each developing 2,600 horsepower, the plane has been equipped with 18 feet, 2 inch props.

As a cargo carrier, the plane has tie-down racks, a new reinforced floor, a large cargo door and a loading ramp. Engineers estimate that 45,000 pounds payload can be readily accommodated, varying with length of flights.

An outstanding feature of the XB-19A is the ease with which it may be handled. Test pilots who have flown it for the last three years point to such advantages as its booster control system and supplementary "flying tabs." Automatic synchronization of the four propellers and the reverse pitch of inboard props, are also contributing factors to its success as a long-haul supply plane.

Front Seat for Navigators

A modified nose section, featuring a remote-controlled reflector gun sight, is providing a front seat and unlimited visibility for lead navigators and bombardiers at a B-24 heavy bombardment wing of the 15th Air Force in Italy. The modification increases visibility approximately 300 percent for these two

what's wrong with this picture?

"Good to the last drop" may describe a reliable parachute, but these four right guys doing seven wrong things to their best friends have obviously never studied up on the proper way to adjust, wear and handle 'chutes. Before jumping to Page 56, however, for a listing of their abuses, pull the rip-cord on your powers of observation and you might find a free fall or two. Participants are (left to right) S/Sgt. Joseph Smith, Sgt. Richard Wetmore, Sgt. Robert Folger and Pvt. Edward Graber, all of the 4000th AAFBU, Wright Field, Dayton, Ohio.

vital aircrew members and enables them to work in closer conjunction with one another.

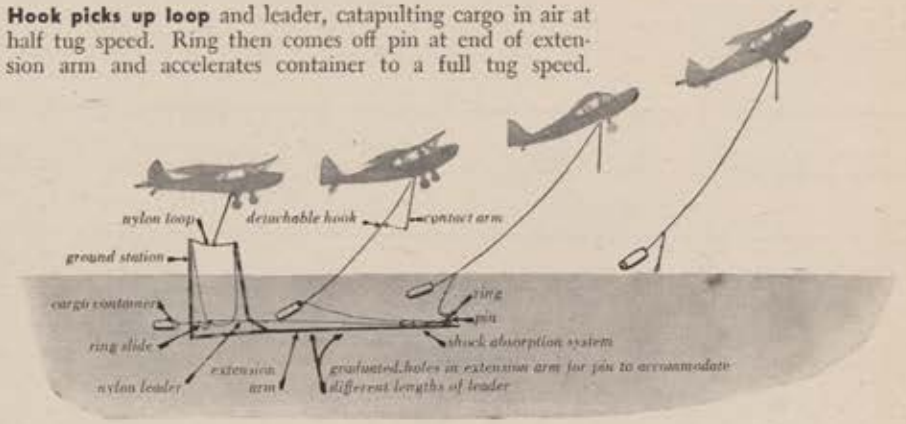
In modifying the Liberator, the nose turret was removed and a section was installed which was then double-decked and encased in plexiglas. The turret gun was taken out and replaced by a flexible .50 caliber machine gun to be handled by the navigator in addition to his regular duties. Other furnishings include a seat, a work table and a horseshoe-shaped footrest located so as not to obscure the navigator's downward vision.

The system of sighting the gun from the navigator's position is an innovation devised by personnel of the wing which initiated the modification. A cable-driven N-8 reflector sight is used with K-7 gun mounts, with reference for the sight being taken from the exact pivotal point of the gun. Gearing and spline shafts were taken from a K-13 shaft to provide mobility for the sight, which moves in elevation and azimuth corresponding to the movement of the gun. The ammunition feed employs a flexible chute, and a booster motor runs from a box mounted in the central position of the nose.

Instrumental in effecting the change —which at present is restricted to lead planes only—were Brig. Gen. Hugo P. Rush, in command of the wing, and Capt. Allen C. Hart and 1st Lt. William S. Matthews, Jr.

Modification to lead B-24s in Italy gives navigator front seat. Interior view (below) shows work table and space for instruments.

Hook picks up loop and leader, catapulting cargo in air at half tug speed. Ring then comes off pin at end of extension arm and accelerates container to a full tug speed.



Liaison Plane Pick-Up

A new, two-stage pick-up system that enables L-type "grasshopper" planes to snatch up 100-pound cargo packets from isolated ground units has been developed by ATSC's Equipment Laboratory to eliminate the bulky reel used by planes for glider pick-ups.

The equipment includes a hook on the end of a springy nylon rope attached directly to the airplane fuselage, a conventional double-pole ground assembly and an arrangement of valve springs and wooden buffer blocks.

As the liaison plane approaches, the pick-up line hooks onto the large nylon loop held between the two ground poles. The ground loop is jerked taut, catapulting the cargo container forward along a guideline at one-half its tug speed. Springs and buffers at the end of the line throw the cargo packet free of the ground, increasing its upward surge to full tug speed, thus resulting in two stages of acceleration. Once the cargo is lifted from the ground it can be pulled into the airplane by hand. Lightweight winches, however, are being devised for reeling in the heavy packets.

Although at present limited to L-type planes and loads up to 100 lbs., experiments are being conducted to apply the device to larger planes which can pick up heavier weights — depending on the strength of the nylon rope used.

Flying a Wing

In the CBI area, where limitations on land transport of spare parts and supplies has forced the AAF to carry everything to China by air, complete wings are frequently lashed to the underside of C-47s and flown over the hump. This expedient requires secure fastening devices and a means of jettisoning in an emergency—both of which have been designed by Mobile, Ala., and Louisville, Ky. Air Depots.

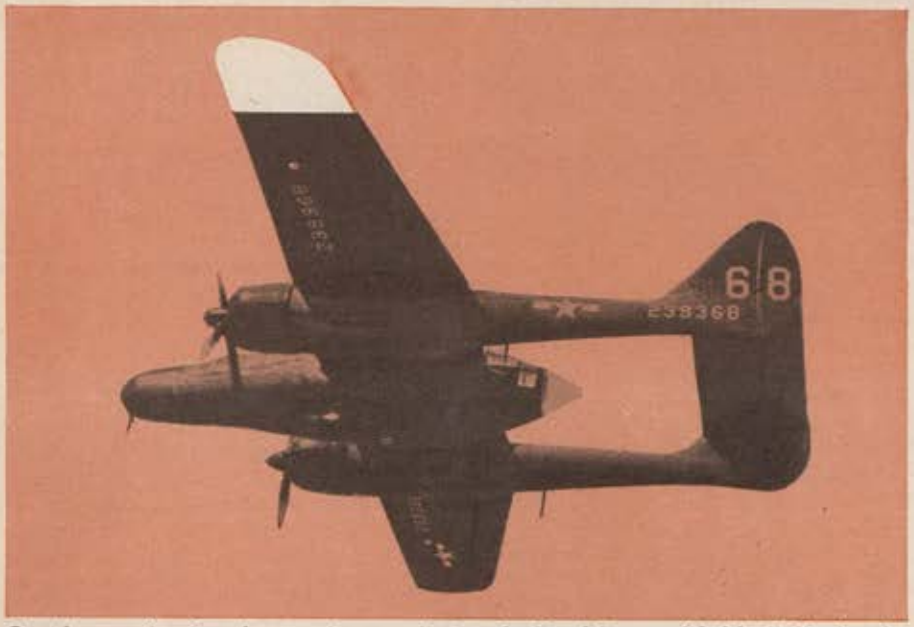
Use of glider tow cable release attachments permit the pilot to drop the wing panel if necessary, while another automatic release device compensates for failure of either fore or aft fastening by freeing the wing when a pull of more than 15 pounds by the partly released section trips the remaining cable.

A fairing over the wing root end reduces drag to about that of an empty towed glider.

Magnesium in Aircraft

In view of a possible shortage of aluminum within a few years at the present rate of bauxite consumption, the use of magnesium—sixth most abundant element in the earth's crust—is being continually increased in more and more airframe and engine parts. Because it is half again as light as most aluminum alloys while possessing equal strength, and because it is malleable, ductile and easily machined, this bluish-white metal has been found to be a particularly well-adapted substitute for critical Dural. New production methods, increased demand for application to jet engines, and tests which have

Slung under fuselage of C-47, this spare wing is flown over the hump to China where it will expedite repair of AAF planes. Panel may be dropped if necessary.



Growing application of magnesium as substitute for Dural is exemplified by P-61 wing tip.

disproved its reputation for inflammable characteristics have all combined to spur its utility.

Already it comprises about 10 percent of the weight of warplane engines, and almost every bomber carries at least half a ton of this relatively new alloy. It is used for crankcases, supercharger housings, blower sections and cylinder head covers on both radial and in-line engines. The B-29's large nose frame and instrument cases, the Black Widow's wing tip skin, the strong substructure I-beams that support flooring of large cargo planes, almost every airplane wheel disc—all of these are now made of magnesium. As applied to jet engines, magnesium is used for "container" parts which are not subjected to high temperatures. Each engine has five large magnesium castings, all weighing under 100 pounds each.

At first glance, the use of magnesium in military planes would seem to be a hazardous undertaking. But recent experiments have established that its igniting temperature is in the same general range as aluminum alloys being used. Magnesium armor plate has been fired at by various caliber shells, including high explosives and incendiaries, and on no occasion did the metal start burning because of the gunfire. In one test, .50 caliber bullets were shot into a magnesium tank containing gasoline and there was no evidence of combustion. In another demonstration, a gasoline tank of magnesium alloy sheet was burned through with a blow torch and the fuel went up in flames and consumed itself—without even melting the tank. In still another experiment, a rocket was set off and allowed to burn inside a magnesium tube, but the metal casing remained intact.

The principal sources of magnesium are sea water and the mineral dolomite. New processes can extract 1,000 pounds from every 100,000 gallons of brine, while dolomite is mined throughout the United States. American magnesium is superior to that produced in Germany and Japan for enemy aircraft, since the domestic product has a very low iron content which gives it greater resistance against corrosion. Production has increased from 3,350 tons in 1939 to 201,804 tons in 1943, although magnesium still costs five cents more per pound than aluminum.

Stratosphere Gun Tests

At Eglin Field, Fla., where the altitude is near sea-level and the temperature is always moderate, the AAF is testing machine guns and cannon at altitudes up to 65,000 feet in temperatures that are 70 degrees below zero. The tests are being run in the Proving Ground Command's new $150,000 high-altitude cold chamber and firing range, which is so strongly built that it will withstand concussion of any gun now used in combat—from a .50 caliber machine gun to a 75 mm cannon.

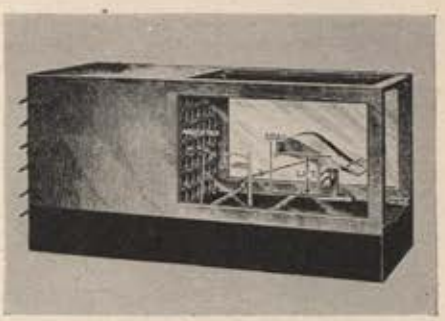
The unit is constructed of heavy steel and comprises four sections—gun chamber, concussion chamber, fan chamber and a shell stop composed of a sturdy concrete sand bin. Thick cork and asbestos line the chambers to provide insulation and fire-proofing, and by separating the firing chamber from the concussion chamber, personnel can fire continuously without exposure to fumes. (See Technique cover.)

Various instruments permit recording of the effects of extreme temperatures and altitudes on rate-of-firing, feeding and operation of all types of aircraft armament. Guns also can be test-fired by remote control from outside the chamber.

New Flight Demonstrator

Without the danger of a stall in an aircraft, students may now actually see in their classroom all of the drama of many fatal low-altitude maneuvers, as well as six other fundamentals of safe flying in three-dimensional form through the use of a model wind tunnel, officially designated as Demonstrator Trainer, Type Q-11.

Housed in a box-like cabinet 20 inches high and 50 inches long, the device consists of an airfoil mounted to move freely in all directions when actuated by an electric fan. Airflow rate and angle of attack are controlled by knobs, and the trailing edge of the airfoil may be moved to illustrate action of ailerons, elevators and flaps. A narrow blue ribbon is attached to the upper camber from the leading edge to the trailing edge to show variations of pressure center at angles of attack.



New training device is in the form of a miniature wind tunnel and illustrates the basic conditions which govern safe flight.

In operation, the apparatus recreates the following major fundamentals of safe flight conditions: stall, lift, proof that total life is produced by the upper camber at zero angle of attack, travel of the chord of the center of pressure in relation to angle of attack, visual illustration of drag and actual degree of drag, use and function of ailerons and purpose and use of brake flaps.

AC/AS, Training, Training Aids Division, has allocated this device only to primary flying schools.

Fighter Bomb Rack

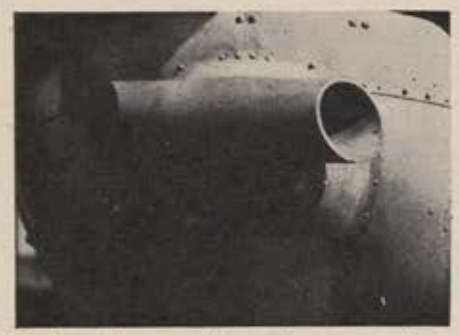
A new electrically operated bomb rack (Type S-1) has been specifically designed to withstand dive bombing pull-outs and has now been standardized for all bomb-carrying fighters.

The rack is made of stainless steel, weighs 6¾ lbs. and is capable of supporting a single 1,600-lb. bomb. Its ultimate load capacity, however, is rated at 19,200 lbs.—the maximum G-force expected of any fighter plane. A 24-volt source insures instant release of the bomb in contrast to previous racks which had a tendency to "hang-up" the missile for fractions of a second after actual release—the result of pull-out forces. When it is necessary to drop bombs without arming them, as emergencies arise, a novel safety device insures positive release of such duds. Similarly, a special arrangement makes positive that bombs are armed.

Minimum installation maintenance is achieved by having only two bolts which hold the rack in its cradle under the fighter's wing.

Skymarker Smoke Bombs

New colored smoke bombs for aerial signalling and visual indication of enemy targets, have been developed for use by the AAF in combat theaters the world over.



Bomb release point marker mounted on B-24 under tail turret and over formation lights. Bevels give corona effect to charge.

In tests at Eglin Field, Fla., the M87 skymarker bomb, perfected by the Technical Command of the Chemical Warfare Service, proved itself satisfactory for use with precision instruments in bombing enemy targets through clouds, smoke screens and other conditions preventing normal sighting. It is a thin-walled bomb containing eight colored smoke grenades set off by a special ignition fuze. While falling toward the enemy installation, the skymarker leaves a bright trail of red or yellow smoke which persists for at least one minute and which is clearly visible

on the line

with mechs around the world

The old heave-ho method of testing a safety belt, using a cumbersome weight and lever arrangement to establish its strength, has been scaled and found wanting by members of an ATC crew at Long Beach, Calif. Most belts are now able to withstand a 1,000-pound pull, but with the device developed by Capt. George Boling of the unit's Ferrying Division, you don't have to be an Army mule. Using salvage materials, he built a frame surmounted by a hydraulic cylinder and pump. With the belt fastened at the base of the frame, the hydraulic apparatus can set up any desired test strain on the belt, limited by a regulator which prevents overloading.

Moving to a new area in the Pacific, a service squadron of the 13th Air Force found itself without portable electric generators for producing power. Undismayed were Sgt. Herman Goldstein, Benton Harbor, Mich., Sgt. Edward Jorgenson, Santa Fe, N. M., and Cpl. Fred Kelly, College Park, Ga. Using the parts of some 16 condemned jeeps, they put together a field power plant, complete with a self starter and a panel for indicator gauges. All service needs were ably met and the work of the squadron was able to continue with only a temporary interruption.

Up in the air, when flak or gun fire severs a bomber's control cables, there is usually very little that can be done to repair them, and in most cases the plane has to be abandoned. To provide an effective remedy for such emergencies, Major Jesse White, Ontario, Calif., and his assistants, S/Sgt. Howard Yancey, Buffalo Junction, Va., Sgt. William Yuran, Billings, Montana and Cpl. John L. Speer, Apollo, Pa., ransacked the scrap piles of the tubing and cable shop of the engineering section at their Air Service Command depot in Italy, and finally came up with a device for repairing control cables while the plane is in flight.

The contrivance requires no tools and consists of two lengths of cable with a turnbuckle in the center. On one cable the male end of the turnbuckle is clamped, while the female end is fastened to the other.

In each of the three holes on the turnbuckle, a 6-penny nail is inserted with its point flattened to prohibit removal or loss. The outside ends of the cable are equipped with a U-bolt clamp with a machined handle. This U-bolt has an ordinary hex nut on one arm but the other nut is on a T-shaped extension to permit tightening by hand without interference.

As used in emergency control cable repair, the severed line is located and the new portion is clamped onto the broken ends with as tight a tension as possible. Then, holding the nails in one hand, the other nails in the turn-buckle are tightened until the correct tension is achieved. Such a procedure can be performed in a few minutes by any member of the crew, and enough cable is carried as standard equipment to enable the splice to be made around pulleys if this procedure should become necessary.

Pin-up planes of the month are "Shoo-Shoo Baby," a 15th Air Force B-24, shown at top with her pilot, Maj. William S. Shoemaker, Kenneth Square, Pa. She was crew chiefed by M/Sgt. Lester Halonen, Milwaukee, on the 510 combat hours she flew before an engine change. Above, "Ish-Tak-Ha-Ba," a 9th Air Force B-26, has rung up 111 missions. Plane's crew chief is T/Sgt. Paul Fast of Liberty, Kansas.

By removing the armament, taking off the rear armor-plate and altering the position of the radio set in war weary P-47s, mechanics at a 9th Air Force Service Command base in France were able to change several of these retired Thunderbolts into two-seater utility planes instead of turning them into scrap piles for spare parts use.

The revamped fighters are used for passenger transport and for combat observation flights, as well as for test purposes in which crew chiefs and mechs are taken up to observe for themselves the reactions and flight characteristics during actual operating conditions of instruments and mechanisms on which they work.

One of the first of these conversions was made by the mobile repair crew of T/Sgt. Thomas W. Haward, Bloomington, Ind. It was flown by test-pilot David W. Wagner of Boulder, Colo.

to planes flying five miles to the rear.

At a B-24 wing headquarters of the 15th Air Force in Italy, the need became apparent for an accurate and instantaneous visual signal for "bombs away" on the lead ship of a box when all bombardiers are toggling on the leader. At the recommendation of Brig. Gen. Hugo P. Rush, wing commander, an effective solution was executed by Major Edward Perry.

Unofficially designated as "Release Point Marker, M-1," the device holds and fires a pyrotechnic charge the moment the indices in the bombsight meet, or upon toggling the bombs from the racks. With the marker in use, the bombardiers are no longer faced with the inevitable time lag between actual release of bombs in the lead plane and their first view of them. If the lead ship fails to drop its bombs due to technical difficulties, the charge will still shoot out, enabling the other planes to let loose with their bombs and eliminating the danger of making a second run over the target.

WHAT'S WRONG with the picture on Page 52

1. Unless the soldier at the left hides the silk, he won't be hitting it. Part of your 'chute showing means that you're harnessed to unserviceable equipment. Check your parachute yourself and turn it back for repacking if it's not all right.

2. The same airman has uneven leg straps. When he fastens them on and then has to jump, he'll get a very one-sided reaction on the opening shock.

3. We know it feels good to sit down once in a while, but a back pack is not a chaise lounge. The man sitting at left is taking a chance on causing defects to fittings and releases by which his life may hang.

4. Contrary to his apparent opinion, 'chutes do *not* need lubrication. Another inch or so and his pack will be soaked with oil, possible ruining the 'chute itself.

5. An easy-going Joe is the man standing in the center. But when he reaches for the rip cord he'll find that the twisted chest strap has made it almost impossible to pull.

6. Nobody seems concerned about the unassigned parachute under the lower ball turret, but there is always danger of acids or oil dripping down and spoiling both pack and contents.

7. The reclining crewmember with the chest-type 'chute is in for a sad awakening, when he finds that the snaps on harness and pack cannot be mated. Be sure that your quick-attachable 'chute has proper snap and ring combination so they can be hooked together.

The Intercom

AIR FORCE presents these answers to its Question of the Month. Replies are those of personnel recently returned from combat duty.

QUESTION: What was the smartest trick you ever saw pulled in combat?

1st. Lt. Roy C. Schmidt, pilot, 8th Air Force: "We had a very long haul to a target deep in Germany. The Nazis threw up a smoke screen and our group was awaiting orders as to whether we should try to hit the original target or go on to the secondary. We got separated from the wing, and suddenly our group leader gave orders to lower the ball turrets. As the turrets went down, we were jumped by a lot of fighters. But they saw the turrets and left without attacking. Our leader must have smelled those fighters—that order was the smartest one I had ever received."

S/Sgt. Vincent Coppola, gunner, 15th Air Force: "I saw a B-24 come in with only one engine—and any pilot that can do that is plenty smart. A group had gone out to bomb oil refineries in southern Italy and we were lined up watching them come in. One Liberator was badly beaten up—it had no tail turret at all and Number 2 and Number 4 engines were out. The pilot had leveled off and was about 200 feet from the ground when he feathered Number 1. Yet he brought that ship in for a perfect landing. It didn't even roll over or leave the runway."

1st. Lt. Hans Rothe, engineering officer, 20th Air Force: "We were ordered to change the oil tanks on our B-29s. Ordinarily, it takes almost a month to make the change but our ground men revised the procedure. Instead of working from the bottom, they took off the nacelle plate from the top, cut through the sheet metal, and pulled the tank out with a hoist. By doing it that way, the whole job was finished in just four days—a typical example of American ingenuity. Now all changes are made that way."

S/Sgt. John Stoddard, gunner, 10th Air Force: "We were bombing some railroad sidings in Burma. We came in at about 190 feet and dropped our entire load. Just then, a land mine went off. Railroad ties, tracks, hunks of boxcars and practically everything else blew up in the pilot's face. At that altitude, I thought we were goners. But our pilot banked sharply and held the plane sure and steady—we didn't even lose 50 feet of altitude. That was the smartest flying I have ever seen and, believe me, it was quite a feat."

S/Sgt. Bertram Hersh, gunner, 12th Air Force: "We were at 12,000 feet over Toulon Harbor on D-day. There was a lot of flak and just when it started to get our range, we suddenly dropped to 7,000 feet. We had been briefed to do that and it certainly fooled the antiaircraft gunners. We had taken a couple of hits at the higher altitude, but at 7,000 feet we were completely free of the flak. We got back without anything happening. I think that was the first time anybody pulled a trick like that."

Sgt. Francis Nelly, radio operator, 10th Air Force: "A Jap plane attacked a C-47 carrying supplies from India into North Burma. But the transport pilot substituted flying ingenuity for his lack of armament. He dove into some clouds right above a mountain and the Jap followed him. Evidently, the C-47 pilot knew the exact altitude of the mountain and the Jap didn't because the transport pulled out just above the top peak and the Jap crashed into it. That was pretty smart flying, just about any way you look at it."

WHEN IN TROUBLE—SOUND OFF

The rescue boys will find you a lot quicker if they know where you go down

All along the line they keep telling you, "If there's a possibility that you're going to crash, give the guys on the ground a chance to find out where you are—transmit for a fix, give a position report, or if you don't feel like talking, just flip the toggle switch marked 'emergency' on your automatic transmitting equipment."

And yet every once in a while there just isn't time for any of this pre-crash etiquette—as crew members of No. 157 found out.

No. 157 was a B-24 with a nine-man crew, and it was practicing emergency procedure recently at 10,500 over a valley 25 miles southeast of Tonopah, Nev. While they were going through three-engine operation with the No. 3 engine feathered, the No. 4 engine sputtered and quit.

The plane swerved suddenly and violently to the right. The pilot instinctively gave her right rudder—apparently with considerable violence, because as he pushed forward with his foot, the seat broke under the strain and he fell backward in a tangle of parachute straps and safety belt.

Now the Lib was really out of hand. The tail began to flutter dangerously and the crew in the back bounced around like dice in a birdcage. The copilot grabbed the controls and chopped throttles on No. 1 and No. 2 engines.

He got the plane under control all right, but not until it was only a few feet above the ground—so low, in fact, that he had to make a wheels-up forced landing.

A little operation like this naturally kept the pilot somewhat busy, but that was no excuse for not ordering the radio operator to send an emergency signal. On the other hand the radio operator could not be expected to send an emergency signal except at the command of the pilot. He probably figured the plane would get out of its difficulties. Anyway, the plane was down in the desert at 1800 hours, and nobody on the ground had the vaguest idea where. Rescue men had no information except that the plane was missing and had been gone long enough to be 600 miles away.

Even so, ground controllers have a few tricks up their sleeves for such emergencies, tricks that have earned their reputation as crash detectives. Back in 4th Air Force's control room, they put the rescue machine into action.

When Tonopah notified the 4th Air Force controller in San Francisco at 1937 hours that they hadn't been able to contact No. 157 since 1720, when it was still over the field, the controller told them to keep trying to establish radio contact and tell the B-24 to turn on its emergency transmitting equipment. If the regular transmitter was out, the controller reasoned, the plane might still receive the message and then it could be located by electronic detectors if it were still in the air.

Next, the controller alerted the Air-Ground Control net. If the B-24 could still transmit, it could be D/F'ed by AGC. Then he called Fresno. At 2049 the emergency rescue officer at the Tonopah field sent out a search plane to check every auxiliary landing strip in the area.

All planes in the air were alerted to look for the lost plane, and even the fighter radio channels were checked. None of this did any good, however, because the plane was already down between two mountains with a broken antenna. So at 2200 No. 157 was declared lost, and the radio stations abandoned their efforts on contact. At this point the Forest Service, the State Highway Patrol and the CAA entered the hunt, but it was too dark to search thoroughly.

Tonopah resumed its own aerial search at 0500 the following morning and at 0745 one of its planes sighted the wreck and reported it by radio. It was only 15 miles southeast of Tonopah, but was almost hidden from view behind a range of mountains. Thirty-three minutes later, ambulances, a doctor and others of the rescue party arrived but only one of the crash victims was hurt and he merely had sustained minor cuts.

Many crews don't get off so easily in a crash, and cases are legion where men's lives hang on immediate rescue and medical aid. It's up to the pilot and radio operators in the plane to let the ground men know where they are. Tell your ground station as soon as the trouble begins—don't wait until it is too late. D/F stations can get a fix on you—in case it turns out a few minutes later that you really need help.

If your trouble disappears, you can always call your controller later and cancel the alert. But play safe.—remember, when in trouble, SOUND OFF! ☆

"... please sir—shall I send an SOS now?"

From "Mayday in Action"—4th Air Force

DROP ON CORREGIDOR

(Continued from Page 10)

underground installations battered to a pulp, the time had come for one of the most difficult operations in airborne military history.

At 0830 on the morning of February 16, a C-47 appeared over the hazy horizon, flying at 1,000 feet. Lt. Col. John Lackey, CO of the 317th Troop Carrier Group, was at the controls and behind him sat 24 hardened veterans of the 503rd Parachute Infantry Regiment. The smoke of the final combined naval and air bombardments still billowed over Corregidor as the C-47 neared "Topside"—a rocky plateau with its two tiny "jump" areas, the largest of which was 1,700 by 700 feet and perilously close to 500-foot sheer cliffs. Eight paratroopers tumbled from the transport.

Other C-47s followed close behind, flying in two strung-out trains. They came in nosed slightly downward on a gentle glide at about 110 miles an hour, a thousand feet above sea level but less than 600 feet above the bomb-shattered terrain. Jumpmasters counted four seconds at the "go-points" before loosing their eight-man "sticks." The areas were so small that to drop nine men at a time would have the last man falling into the bay.

The wind velocity increased and the jumpmasters' counts went up to 10 seconds as the two sky trains passed the dropping area and diverged north and south, swinging in two great counter-rotating circles for their second and third eight-man runs.

For one hour and 20 minutes, 50 C-47s sowed their human cargo on the plateau until the ground was literally blanketed with white parachutes.

All during the paratroop operation, A-20s had made strafing runs over the neck of the chop-shaped island, erecting an effective wall between the main portion of "The Rock," where our men had landed, and the tail of the chop where surviving Japs had formed into a strong pocket.

Paratroopers of the 503rd Regiment alone held Corregidor for 40 minutes, and at 1030 the first waves of landing craft hit the island's only beach. The men walked ashore with their rifles on their backs.

It took some hard, hand-to-hand fighting to dig the Japs out of the holes they had burrowed into, but on March 1, General MacArthur announced that the destruction of the enemy garrison on Corregidor had been completed for all practical purposes. Four thousand, two hundred and fifteen enemy bodies already had been counted while hundreds of others had been sealed in the tunnels and caves of "The Rock." Our losses: 136 killed, 531 wounded, 8 missing. ☆

Answers to "How Sharp Are You?"
on Page 2

1. Third
2. Two
3. P-51 (All four are P-51s)
4. Second
5. H L A
6. Wingtips, tail assembly
7. Third, "Q"
8. WD
9. Six
10. True

RHINELAND RENDEZVOUS

(Continued from Page 28)

mental command post.

Some of the glider pilots were passing through to the evacuation center; all were grimy and tattered; they had seen plenty of action. They were pilots up to the moment they landed. Then they became infantrymen, for it was a case of fight or die. Most of them stayed close to the paratroopers, manning machine guns and joining in the assault against enemy strongholds. One of the pilots was particularly proud. He had fired a bazooka for the first time and had stopped a tank with his opening shot.

At division headquarters we joined up with F/Lt. F. Begillis, a Canadian Spitfire pilot who had just been shot down. He had come over a road to strafe a truck when he noticed it had a Red Cross painted on its side.

"I pulled up and waggled my wings to let them know I wasn't going to shoot," he said. "But they opened up on me with a gun mounted alongside. After this I'm not going to be so kindhearted."

From American headquarters we found our way across the Rhine, and after two days we were back at the 313th Group. It was a grim story that they told us on arrival. The mission had exacted a costly toll. Twenty of the group's C-46s had gone down before the enemy's ground fire. Five others had made emergency landings at other fields. Of those returning, 33 limped back with battle damage.

There was little variance in the tales of returning crews.

"The sky was full of flak," reported 1st Lt. Ernest A. Hammesfahr. "We could smell cordite in the air and we knew that our plane was hit. It began to vibrate, and bits and pieces were breaking loose from the wing. We made an emergency landing just inside friendly territory."

1st Lt. Edward C. Koenig told how his right engine was blown out by a shell just after the last paratrooper had jumped. "Planes were burning and going down all around us," he continued. "We finally picked up enough airspeed to level off, but by then we were right on the deck and that's when we really got it. One shell burst through the plane and we were being peppered by small arms fire. Just as we were about to cross the river, a shell hit our left engine. Then we really became glider pilots. We picked out the nearest field and set her down. We all got out and started running, fearing the plane would explode. Some civilians were shouting at us but we didn't pay any attention. We didn't know we had landed in the middle of a mine field."

The 313th had suffered a punishing blow, but its losses reflected neither on the performance of its aircraft nor on the skill of the pilots and crews. It was simply the turn of chance that its aircraft had passed over the most heavily defended area in the invasion zone. Had the group been assigned a different course or had it reached the target an hour later, the casualties probably would have been negligible. As a whole, the airborne landings were outstandingly successful.

Including the losses of the 313th, the entire operation had cost less than 60 powered transports.

Nearly 98 percent of all parachutists were dropped successfully and the same percentage of all gliders was released at the assigned landing zones. Air cover was so effective that not a single plane or glider was shot down by enemy aircraft. Ground opposition was much more intense than in the Normandy and Holland operations because of the limited area involved in the landings, yet of the more than 2,000 tons of field pieces, supplies and ammunition dropped and landed in the area, very little fell into enemy hands. Well over 90 percent of the bundles dropped by the Liberators was recovered by our troops at troop carrier headquarters.

The operation was hailed as another forward step in airborne operations. It had achieved its objective at minimum price and those who shared in its planning were confident that it would serve as a model for airborne missions of the future. ☆

First victim of the airborne invasion over the Rees-Wesel area was this smashed B-17, shot down during photo mission. This photo was taken by Lt. Neely from IX Troop Carrier plane.

Rendezvous

(Continued from Page 3)

Sackcloth and Ashes

Dear Editor:

Yours is one of the finest magazines on matters pertaining to airplanes and stuff in the business, but after all, to err is only human. After eight long months of "Ready! Now!" instruction in aircraft identification, a mistake like the one in the shots accompanying the article "Isolating the Battlefield" could never escape the sharp-eyed cadets at SAACC. The plane on the top of Page 8 in the March issue is an FW-190 and not an ME-109 or we've been calling them wrong all these months. Maybe you had better call back that excaption writer.

You've still got a lusty vote of confidence from all the eager beavers here, so thanks for your splendid magazine.

Aviation Student Oscar Schmitt,
San Antonio, Texas

Dear Editor:

On Page 8 of your March, 1945 issue, please recheck the photo captioned "Phase 1." If that is an ME-109, I'll eat an aircraft identification book. Five obvious features make it a FW-190. How about that?

Sgt. Russell F. Swartz,
Wright Field, Ohio

Dear Editor:

Mr. Messerschmidt is gonna be awful mad at you for calling that pile of junk, at top of Page 8 in your March issue, one of his junk piles. It is a FW-190 if I ever saw one, (in recognition class).

F/O Robert H. Breen,
Punta Gorda, Fla.

Dear Editor:

Have the Germans begun to use the B.M.W. 801 or 802 series radial engines in the ME-109 as pictured on Page 8 of the March 1945 issue? In most other respects the plane looks like a FW-190.

Thanks for an excellent issue.

Pvt. Lee Whitney,
Pope Field, Ft. Bragg, N. C.

Dear Editor:

If that photograph you call a ME-109 is the real thing, I'll eat the whole magazine.

Bobby Scott, Edna, Texas

Dear Editor:

In your March 1945 issue one of the questions asked about "How Sharp Are You" is, "Where is the helmet of the man bending over the engine?" It is question number four, I think.

Please make the correction that he is not bending over the engine, but is examining or working on the guns. The engines are on either side of the cockpit nacelle.

We might add that AIR FORCE is undoubtedly the best publication in the armed forces or in fact the best of its kind we've ever had the pleasure of reading. Congratulations!

S/Sgt. Wilson J. Peck, Orlando, Fla.

Dear Editor:

If the man with the helmet on is bending over an engine—the "Joe" in front is cleaning out rocket tubes instead of machine guns.—(March issue of AIR FORCE.)

Lt. B. Colabella,
Ellington Field, Texas

Dear Editor:

Are you sure the ex-caption writer is not at large?

That ME-109 on Page 8 is a FW-190.

Sgt. John L. Parcels,
Moody Field, Ga.

Dear Editor:

Since when does a P-38 have three engines? This pertains to the "How Sharp Are You?" questions on Page 45.

T/Sgt. Eugene Knitter,
Chanute Field, Ill.

We were wrong. It was an FW-190. The man with the helmet is bending over the armament compartment of the nose of the pilot's nacelle. We really knew better, and the only gremlin we can blame is carelessness.—Ed.

Postwar Problem

Dear Editor:

Enclosed is a poem by a 10th Air Force sergeant. Although the mysticism of India may have influenced Sergeant Johnson to gaze into the future, his inspiration is strictly GI, his subject meaty.

Capt. Lawrence P. Bachmann
AIR FORCE Correspondent, CBI

An Ode to the Fighting QM

What did you do in the Great War, Pop?
Didja kill any Germans or Japs
Or sink a submarine perhaps?
Didja win any medals shiny with gold
Were you a Marauder, brave and bold?
Didja come home laden with spoils and booty
Gained thru initiative above line of duty?
Didja get any wounds, Pop, show me the scars.
I bet you looked swell with your Captain's bars.
Were you a pilot Pop, skimming the skies
Shooting down Zeros, like swatting flies?
Were you in Burma, with Ghurkas and Sikhs
Lost in the Jungle with no food for weeks?
Were you a hero, Pop, how did it feel
To be the attraction in a Fox News Reel

(Continued on Page 60)

PICTURE CREDITS

FRONT COVER: Eugene Furnish, ATSC. 8: Signal Corps. 18-19: T/Sgt. Carl Gifford, Wright Field. 32-33 and 38: T/Sgt. Roger Coster, AIR FORCE Staff. 37: Chinese News Service from Guillumette. 42: Maj. Herbert O. Johansen, AIR FORCE Staff.

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DODGING FLAK

(Continued from Page 7)

course before another turn would be required. So long as this procedure of flight is followed the chances of being hit are relatively small.

The lead plane must start the turn well before the allotted time for the shells to arrive, so that the entire formation will be out of the way by the time the bursts reach the formation's altitude. Flak gunnery is not 100 percent perfect and errors of 800 to 1,000 feet are common at high altitude. The dispersion volume will be large when fired by several batteries and most bursts will be toward the center.

Hence, the chances of being hit are greatly lessened when flying on the outer edge of the dispersion volume.

PREDICTED CONCENTRATIONS

Less accurate than continuously pointed fire, predicted concentrations appear as a cluster of bursts, all occurring within a few seconds of each other. They are usually concentrated about a point which is again predicted somewhere along the formation's course. Gunners resort to this method of fire when visibility is poor. Under these conditions, if suitable countermeasures are used, it is almost impossible for the enemy to track. Although the gunners cannot track continuously, sound locators, "shadowing" and spotter aircraft are often used to relay to the gun batteries the formation's altitude, speed and direction of flight.

The enemy gunners then fire one or more salvos at a predicted point in space. Each battery fires in advance of the ETA of the formation by the same number of seconds as will be required for the shells to reach the point. Therefore, in this type of fire, several batteries will produce bursts simultaneously.

The fundamental weakness of predicted concentration is that about 90 seconds of predictable flight are required for the first predicted concentration. Following concentrations can be produced about 60 seconds later.

By following the rule of never holding a course for more seconds than altitude in thousands of feet, flyers can make it almost impossible for the gunners to get the course, make their calculations, fire and have the projectiles reach the formation accurately.

BARRAGE FIRE

The most ineffectual type of fire is barrage fire. It is used only when conditions are such that the flak fire control system cannot track the target, or when the central system is damaged or missing. They then resort to other sighting instruments to determine the path of flight. Barrage fire takes the form of a large volume containing intermittent bursts. It stands still, with bursts occurring over a long period of time. Since the gunners cannot predict, they select a volume of sky where they think the formation will level out. They then continue to fire every available gun into the barrage so the formation will be required to fly through the "box" to reach its objective.

It is possible for a flight to go under the "box" and drop its bombs. However, large formations are generally not flexible enough to execute this maneuver.

Some of the more important rules are:

1. Take evasive action up until the start of the bombing run.

2. Make the bombing run as short as bombing accuracy permits.

3. Upon completion of the bombing run resume evasive action and continue it until out of range of enemy flak. (Evasive action at high altitude should be deliberate and irregular rather than quick or violent.)

4. If other bombardment planning considerations permit, keep the time interval between successive bombing units as short as possible.

5. Prediction accuracy begins to decrease rapidly when an airplane travels at high speed or changes altitude at a rapid rate.

6. Heavy flak is much more accurate below 10,000 feet than it is above altitudes of 15,000 or 20,000 feet.

7. On low-level attacks through automatic weapons fire, the best tactics are surprise and speed. Go straight in and straight out—fast and low. Do not climb or resort to evasive action other than for skidding turns. Speed is essential.

Listen to the advice of your flak officer and you'll have a considerably better chance of beating flak—and coming home alive. ☆

Mitchells of the 5th Air Force completely surprise a nest of Jap antiaircraft guns in a low-level attack against Boram Air Field, New Guinea. Several supply dumps were destroyed.

THEY MAP THE WORLD

(Continued from Page 24)

This amphib got its geodets to an otherwise inaccessible jungle area in South America.

Control station, Smith Bay, Alaska. Star fix will be taken with instrument at left.

Geodet party, en route to station, leads jeep and equipment on Chinese river barge.

Local guides are frequently employed by land parties to lead their mapping trips.

distances are great, four-engined aircraft do the job. The latter was the case in June, 1944, when a plane piloted by Lt. Lloyd Vincent made the first photographic reconnaissance of the Kurile Islands from the Aleutians. He got down as far south as the island of Shimushiru, some 500 miles from the home islands of Japan, in a 12-hour flight in a B-24. In these operations, photographs were made for use by the 11th Air Force in its tactical, pin-point bombing.

The photographic mappers fly specially-modified aircraft such as the F-7, F-9, F-10 and F-13. The photographic equipment consists principally of 3K-17 trimetrigon cameras. The trimetrigon system of photography was devised by Col. Minton W. Kaye, former commanding officer of the 1st Mapping Group, and Col. Gerard Fitz Gerald, formerly of the U. S. Geological Survey and a veteran of many Arctic operations.

The 311th is a small army in itself. All operations are temporary duty assignments out of headquarters, Buckley Field, Colo. The planes attached to the wing carry their own specially trained aircrews and ground crews.

Prior to the war, the German General Werner Von Fritsch said, "The military organization with the best aerial photo reconnaissance will win the next war." The topper to that statement is made by Colonel Polifka, who says, "I believe the general was absolutely right; anyone can see who's winning it." ☆

Answers to Quiz on Page 46

1. (B) False
2. (D) Prisoner of war camp for Allied airmen
3. (B) Weather map
4. (A) Ascension
5. (C) 31 tons
6. (A) True
7. (B) 7,000
8. (C) Topsys
9. (A) Only to Army units
10. P-61 Black Widow
11. (C) A joint board to effect cooperation between the Army and Navy in the development of aviation
12. (B) Plus 1G
13. (D) Honshu
14. (C) Shooting Star
15. (B) Kunming
16. (D) Twin-engine twin-place fighter
17. (C) Weather investigation and forecasting
18. Army Airways Communications System
19. (A) 72,000 feet
20. Model N at right

Rendezvous

(Continued from Page 59)

What did you do in the Great War, Pop?

He asked me these questions
Astride of my knee
His eyes bright as diamonds
Sparkling with glee
In anticipation
Of the tale to be told
Of when Pop was a soldier
Strong, brave, and bold,
Just like at the theater
awaiting the curtain
'My Pop is a hero'
Of that he was certain.

I lit up my pipe
Just stalling for time
What should I tell him
This son of mine.

Should I speak of Tarawa, Attu, and Rangoon
Of bloody campaigns in the roaring monsoon
How when wounded and weary I still carried on
And boast of the medals and honors I'd won
Or should I admit the truth like a man?
I issued the Spam in Old Assam.

Sgt. Robert L. Johnson
Staff Quartermaster Section
10th Air Force.

Breaking Records

Dear Editor:

In your November issue I read about a few records that were made with the B-17, B-26 and the B-25, also the Editor challenged anyone to beat them. I for one would like to tell of a few records made by our squadron.

During the Buna Campaign half of our planes flew 25 missions for one month, the rest had an average of 10 to 15 missions for the same month. During the push up the New Guinea coast this record was again made and broken several times.

When I left the Group in April, 1944 quite a few of our original planes that we had flown across the Pacific were still in the fight. One in fact had 200 missions and 900 hours combat time.

This Group also made a record in maintenance, combat flying, etc, for the year of 1943, which was the best record in the whole Southwest Pacific. Also a record was made during a double engine change for one of the squadrons. Starting from scratch and nothing to work with such as new parts, adequate tools and under adverse weather conditions, the double engine change was made in four hours for each engine and this was accomplished time after time.

The B-25C, "Dirty Dora," that the November issue referred to, was one of our Groups original planes that we brought over and to my knowledge "Dirty Dora" is still laying her eggs.

M/Sgt. M. C. Simmons,
San Francisco, California

Thanks for accepting our challenge, Sergeant.—Ed.

RESEARCH FROM THE RANKS

(Continued from Page 19)

for the design of a special relief valve for hydraulic systems that shows promise of doing its job better than present devices. Safety locks which insure that a 50,000 pound drop test rig won't fall at the wrong time and crush test engineers, are the contribution of a corporal.

Two other soldiers, whose participation in tests has been directly responsible for advancing such projects as the pressurized cabin and the Anti-G suit, are Pfc. Milton H. Joffe and T/Sgt. Matthew E. Keller.

Joffe is one of the few persons who can tell you what it feels like when a pressurized cabin blows out. He was the subject for early decompression tests in a fighter cockpit before we had pressurized cabins in any fighter plane. They put him in a P-38 cabin mock-up whose inside pressures were equal to 8,000 feet, then with the whole fuselage inside a large low-pressure chamber they simulated outside altitude pressures of 35,000 feet. When everything was going smoothly, someone smashed in an aperture in front, instantly equalizing inside and outside pressures.

More than a hundred times Joffe climbed into the test chamber and was "explosively decompressed." Air gushed from his mouth and nose, his cheeks puffed out but nothing harmful happened. Joffe had helped to verify what aero-medical experts long had preached—that within limitations pressure cabin "blow-outs" were harmless to the human body.

Keller did the same thing for the proponents of the Anti-G suit. Time and time again he has been whirled round-and-round at tornado speeds in the centrifuge, withstanding terrific G-forces. Sometimes wearing the Anti-G suit, sometimes without it, he accumulated data that have made possible improvements in the suit design—lightness and comfort.

Oddly enough, a big aeronautical research center is hardly the place you would look for a sculptor, but Sgt. Robert Charles Koepnick is one of the best. So modest that he reddens up like a beet, when you talk to him about his work, Bob is indirectly responsible for the shape of the A-13 pressurized oxygen mask. From rough drawings he fashioned the first mask in modeling clay. Working against exacting measurements—33 in all—he carved four different sized wooden heads which serve to measure helmet sizes, are used to check helmet designs.

Pvt. Mortimer M. Marks, former owner-treasurer of the Marks Polarized Products Corp., N. Y., is now engaged in experiments with new plastic lenses for pilot's glasses. He also has worked out a new blind-flying training goggle that may eliminate some of the difficulties in blind-flying training.

There are men like S/Sgt. Horace A. Knox, T/Sgt. Francis L. Wallace, T/Sgt. Raymond A. Gregory and Pvt. Bloyce D. Fitzgerald, whose work on special projects has made more than one of our enemies wish he could get out of this war.

Sergeants Knox and Wallace together worked out some intricate details on new bomb-dropping mechanisms. What's more, they left their drafting tables and machine shops, piled into a couple of B-17s in the early summer of 1944 and took the "works" over to the ETO, handing the Germans in France and in the Fatherland some surprise packages they won't forget for a long time.

Sergeant Gregory, 24, of Cleveland, Ohio, won his claim to fame one day in December, 1943 when he demonstrated a new shipboard landing technique to high-ranking Army and Navy officials.

Private Fitzgerald developed a quick and easy method for finding flaws in life rafts by charging the rubber boats with high-frequency current. If sparks flew out there was air leakage; if nothing happened the rafts were sound. The test could be accomplished in minutes where previously it had taken a full day. He helped develop a new cooling device for aircraft machine guns that injected water drops after each round and permitted faster firing.

In the same laboratory there are other men, who are doing equally important engineering jobs: S/Sgt. Russell L. Fine, instrument expert, who is perfecting a tail-pipe temperature indicator that warns pilots when the engines on a jet-propelled aircraft overheat; M/Sgt. Charles W. Woolsey, whose contribution toward development of training devices has, according to Maj. G. C. Melvin, officer in charge—"Simplified some highly technical trainers to a point where even a bobby-sox chaser can understand them."

Or, take Pfc. Reuben Raskin, whom his associates call the GIceman. Eight years of refrigeration engineering in civilian life helped him to develop a knock-down portable-by-air refrigerator now standardized. He is also responsible for helping perfect lightweight air-conditioners for B-29s that enable mechanics to work in pleasant temperatures inside the big bombers when it is necessary to do interior repair work on the ground.

Too, there is Pvt. Morris Nolly, a professional engineer from Delaware. If you saw the fantastic lighting effects that glamorized beautiful girls in Billy Rose's World's Fair Aquacade, you saw some of Private Nolly's talent at its best. He designed the whole lighting arrangement. Now he's using his talent as a research engineer for AAF runway and field lighting systems.

Some of these GI wizards not only think up new ideas, draw up the plans for their own creations and fabricate the inventions, but they go out and run the proof-tests to show that what they have done is beneficial to the AAF.

Take, for instance, big, rugged S/Sgt. George Browne.

In April, 1943, they put him adrift in the Gulf of Mexico alone in a new type of multiplace lift raft, complete with all the then latest sustenance kits, to see how well he could live. Of course, there were boats with other test engineers standing by most of the time, but at night and when the seas rolled up as high as a two-story building George was pretty much on his own. He sweated and baked in the sun all day, then shivered and froze in the cool breezes at night. He fished. Ate his catches raw. It was no picnic, but then neither is it fun when the real thing happens.

It practically wore him out when they ran tests on climbing into the raft. He'd swim up near it, grab hold and over it would go. Then he'd have a hard time getting it rightside up again. That experience gave birth to Browne's contribution.

He devised small rubber handles that are glued to the top and bottom of rafts so it's comparatively easy to grab hold and turn them over. And he developed a small one-rung ladder that makes it less trying to climb aboard when the sea is rough. Guys can thank George for that.

Air-sea rescue stories wouldn't be complete without mention of M/Sgt. Edward J. Pekel, one time inspector for a heavy bomb group of the 13th Air Task Force and now a technician in the Aircraft Radio Laboratory, at Wright Field. Pekel is a tough, seasoned combat veteran—Guadalcanal, Midway and other Pacific isles—who was ordered back to the States because of his exceptional ability in radio repair and experimentation. With Maj. Ray Seale, in a jungle workshop, Pekel put together from scrap pieces, a new radio aid for life rafts. For this work Pekel got the Legion of Merit, commendations from the CG of the 13th Bombcom and General Arnold.

Now he is perfecting the device—an electronic beacon — which guides search planes to a stranded raft. The lifesaving instrument soon will become part of every raft.

Another radioman, S/Sgt. Paul A. Millerwise, has invented a portable "radar car" which is used for testing radar apparatus and other similar equipment on the ground. Previously it was necessary to run actual test flights in order to try out new equipment. Now the apparatus, etc., can be put atop the car and tests run on the ground—saving many flying hours and permitting tests to be made in all kinds of weather.

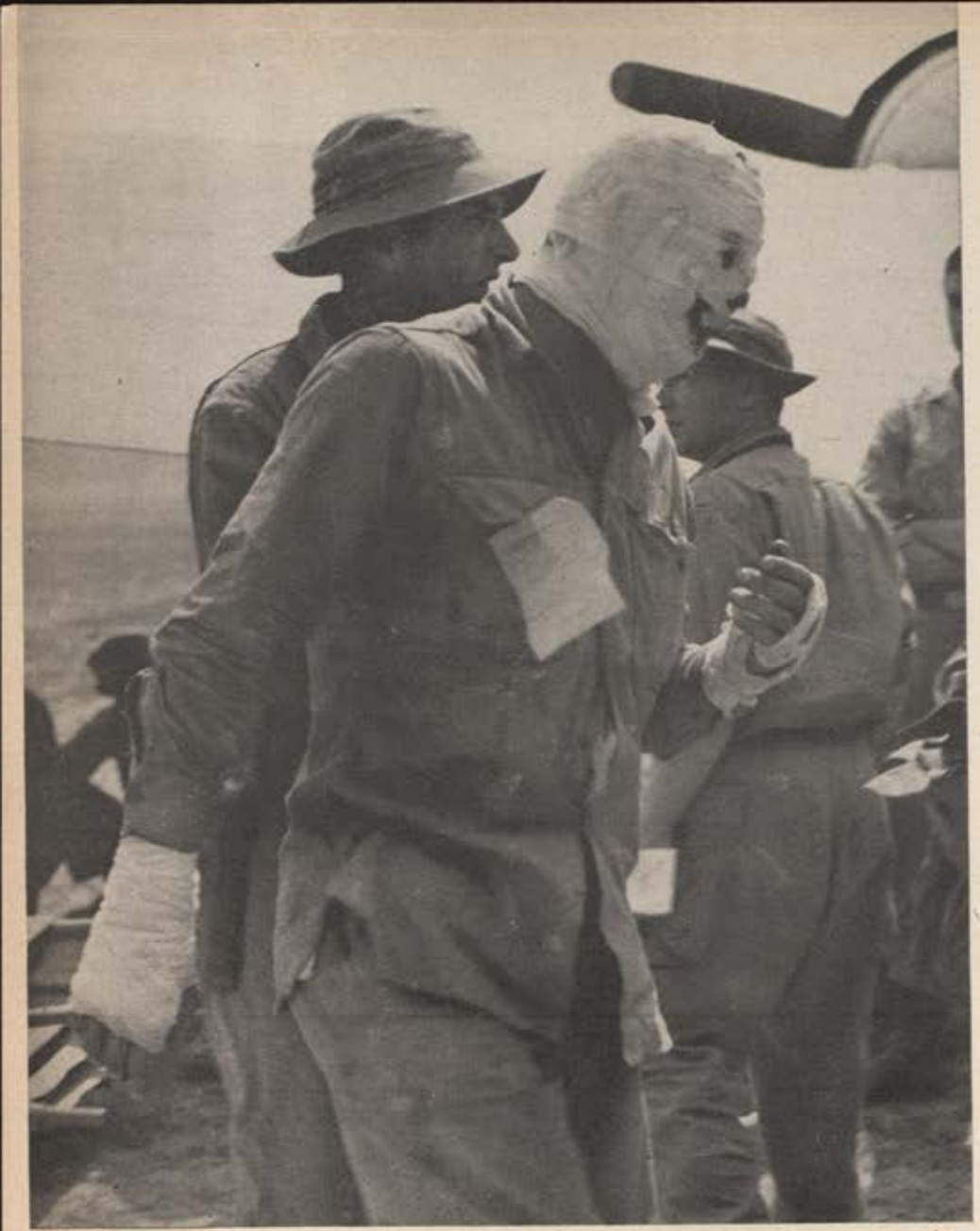
Another piece of equipment is the idea of Sgt. Nicholas T. Simopoulos, who has been given complete responsibility for its design, test, procurement and production. Officers over him say the device will be used on all Very Long Range aircraft and may save millions of dollars of equipment.

Dive-bombing also is getting a shot in the arm today because of work done by T/Sgt. Edward E. Tassi.

Tassi is one of the few EM who can boast of diving in a P-38 at speeds up to 500 mph. During 30 or more tests, Tassi sat hunched up and strapped "piggy-back" in a Lightning when it made dive attacks on ground targets.

Such is the story of the men in the ranks, who take their slide-rules, microscopes, and mathematical formulas, combine them with mechanical ingenuity to help build better fighting planes—the GI ENGINEERS.

As Brig. Gen. F. O. Carroll, chief of the AAF's engineering research program at Wright Field, says: "They've done as much as any of our officers or civilians to help win the war. We need a lot more of the same caliber to finish the job." ☆



Badly burned, one of Merrill's Marauders walks unassisted to an evacuation plane.

BURMA WOUNDED

Battle casualties in Burma no longer have to face long painful journeys back to hospital facilities. Air evacuation saves countless hours and countless lives

Ambulances, backing up to a C-47 on a sun-baked airdrome, deliver casualties who will be hospitalized in a matter of hours, not days.

Monsoon weather fails to halt India-Burma air traffic. Here a combat cargo plane takes off from Assam to supply front-line troops.

Chinese soldier is among those evacuated. Flight nurse stands by.

Glider pilot, wounded during Myitkyina battle, gets plasma infusion.

Jeeps with specially constructed litter frames carry wounded to plane.

SHOOTING THE BREEZE

Southwest Pacific. Almost every plane coming into a 13th Air Force base was reported sighting emergency ground signals coming from an isolated island. Patrol planes reported yellow marker sheets and life rafts pulled up on the beaches. Mirrors flashed at every passing plane and blinkers twinkled through the night. Listening posts heard SOS signals which failed to stay on the air long enough to be pinpointed. Flares shot across the night sky.

When this bewildering state of affairs was brought to the attention of Lt. James F. Mattox, pilot in the Crusaders, a B-25

outfit, he thought he had the solution. Shortly before he and his crew had been forced down in the vicinity of the island from which the mysterious signals were coming. They had been in such a hurry to reach their rescue plane that they had left their emergency signaling equipment behind.

A party was sent out to the island, and sure enough, the natives were having a holiday with flares, rockets, mirrors and the Gibson girl. They were also reluctant to give up the equipment.

"We need," their chief insisted. "We try make flyers come down here so we can trade carved wood and sea shells!"

Somewhere. At a certain airbase which shall be nameless an Army flyer getting ready to land was indulging in some spry radio repartee with the Wac in the control tower. Whenever she gave him instructions he sang out with a cheerful "Roger-Dodger," and some of his other remarks were on the unorthodox, if not breezy, side. The gruff old major who was the Wac's boss listened to the dialogue with growing irritation, and finally snatched the mike himself. "Listen, Army number so-and-so," he barked. "Confine yourself to proper language. Let's have no more of this Roger-Dodger talk. That's an order."

"And who," said the flyer in silken tones, "may you be?"

"I am Major Such-and-Such," rasped the Wac's boss, "and I am the control officer at this station."

"Indeed?" replied the flyer. "Well, Roger-Dodger, old codger; I'm a Major too!"

USA. Lt. S. A. White of Drew Field, Tampa, Fla., recently returned to the States after spending some time as a prisoner of war in Germany. As part of his repatriation process the lieutenant was given a thirty-day leave which he spent in his home town. The news of his return spread quickly. One afternoon the telephone rang and a neighbor told him how glad she was that he was back.

"But don't you dread going back to that German prison?" she asked. Before White could recoil, the solicitous lady added, "Does Germany give all prisoners of war a thirty-day vacation at home?"

Philippines. The staff sergeant tabbed her as just about the prettiest prospect in the village the moment he saw her waving shyly from the second floor balcony of her home. His outfit marched down the narrow street and on to their new quarters. But the sergeant remembered the address. He had come ashore two days earlier and from the way she had looked at him from under flickering eyelashes he felt that his own private beachhead was secured.

He came back next day and the girl went for him from the start. Her father considered him a fine, upright Joe, and all the girl's brothers and sisters scrambled over him to show their hospitality. Things went along from good to best, and one day two of the girl's younger sisters cornered the sergeant and asked him how bridesmaids dressed in the States. He obliged with his limited knowledge, then casually asked who was getting married. "You are," they gig-

gled happily. "Next Sunday!" The sergeant's transfer to another island was arranged in the nick of time.

England. A GI who had been assured by his commanding officer that he would be sent back to the States, and then receive that "piece of paper," was putting it on for the squadron. He said he was going back and give Main Street some real hero talk. While he was building a particularly beautiful air castle one day, a new man took him seriously. The breezy one warmed up.

"While I wouldn't want it generally known," he said confidentially, "I have scheduled an important conference in New York with the Big Three."

"The Big Three?" gasped the dope.

"Yeah," said the joker, flicking his cigar. "Hart, Schaffner and Marx."

Washington. Spring comes to everything, even the Pentagon Building. The other day a friend of ours, an attractive lady too, thank you, emerged and found the cherry trees in bloom and the sun quite hot. As she waited for a bus she stripped off the jacket of her suit and stood there in her shirtsleeves, or blouse-sleeves, or whatever they're called. Then she noticed that a rather small, inoffensive-looking colonel a few feet away was trying to catch her eye. Whenever she looked at him, he smiled ingratiatingly and sidled a few feet closer.

Our friend replied with a haughty stare, but the colonel was not discouraged. He was, in fact, closing in for a final frontal attack when the bus mercifully appeared and the lady jumped into it. She scurried down the aisle with the colonel's hot breath on her neck and sat in the most inaccessible corner where she hoped she'd be safe. No luck, the villain still pursued her. And finally, when he had her at his mercy, he leaned over and breathed in her ear.

"Excuse me, Miss; I just wanted to tell you—your shirt-tail is out!" ☆

THE ALBUM

1910. Here is the first twin pontoon hydroplane shown, fittingly, at Bath, N. Y. These five gentlemen are probably waiting for the tide to come in.

1912. Nervously eyeing the drink, two Army men pilot their Renault Burgess. The hydroplane boys were always ready for a quick dunk among the fish.

1914. Lt. H. A. Dargue sits in the cockpit of an Army hydroplane at Corregidor. Get a load of the costumes on the junior life-savers at the right.

1916. With his water wings lashed securely behind him, Lawrence Lewis got this ferry boat off the surf in less than 5 seconds from a standing start.

N.Y. Tribune
Oct. 18-1912

DUCKS HUNTED BY AVIATORS IN 'PLANE

Beachey and Lieutenant Brereton, U. S. A., Kill Four Over the Potomac.

KEPT PACE WITH FLOCK

Novel Sport Rouses Others in Army Aviation School to Hope for Similar Chase.

Washington, Oct. 17.—A new sport was started, man's superiority over birds in their own element proved and the efficiency of aeroplanes demonstrated in an amazing way this afternoon, when Lincoln Beachey, aviator, and Lieutenant L. H. Brereton, of the Army Aviation School, swooping over the Potomac River in a Curtiss hydro-aeroplane, dashed into a flock of wild ducks, shot four of them with revolvers and then dipped to the water and picked the birds up. The enlisted men at the aviation school ate the ducks for dinner to-night.

So enthusiastic were the aviators who performed the feat, and so enthusiastic were all the other aviators at the school, that duck shooting from aeroplanes is likely to become popular wherever aeroplanes fly.

When they started out this afternoon Beachey and the lieutenant had no intention of shooting ducks, although they had their revolvers with them. Just as they crossed into Maryland, however, the flock of wild ducks, flapping noisily, streamed up around the hydro-aeroplane. Frightened at the strange winged thing that stayed with them, the ducks made haste to escape, assisted by a thirty-mile wind.

Suddenly realizing the possibilities, Lieutenant Brereton pulled his revolver and began shooting. Beachey held the steering gear with one hand and with the other pulled his own revolver and began to shoot, too.

Lieutenant Brereton was the first to bag a duck, but the hydro-aeroplane was going as fast as were the birds and the aviators had little difficulty keeping within pistol shot of them. It was like a chase. The ducks seemed utterly confused. Never had they been so pursued. They dodged this way and that, but always the great, man-controlled bird was near them.

After shooting four of the ducks Beachey brought the machine to the water and started to collect the game. The shooting excursion occupied only twenty minutes. The aviators do not know whether they violated any game laws of Maryland, Virginia and the District of Columbia, whose boundaries meet in the Potomac about the point where the shooting occurred, but they do know that they have discovered a new sport, and that it is the most exciting every known. Incidentally, they say it shows that it is possible to shoot with great accuracy from an aeroplane.

"I suppose," said Beachey, "that this is the first time in the history of the world that ducks have ever been hunted by man flying in the air. Now that the thing has been tried out, I believe it will become very popular. Chasing birds in their own element is certainly the greatest sport of which I have ever heard or that I have ever experienced."

...RS. BELMONT'S FLAG GONE

AMERICAN DEFENSE

ASIATIC-PACIFIC THEATER

AMERICAN THEATER

EUROPEAN-AFRICAN-MIDDLE EASTERN THEATER

PHILIPPINE DEFENSE

PHILIPPINE LIBERATION

OVERSEAS BARS

SERVICE STRIPES

BRONZE BATTLE STAR

SILVER BATTLE STAR

BRONZE ARROWHEAD

for information on your authority to wear these service awards,

SEE PAGE 25