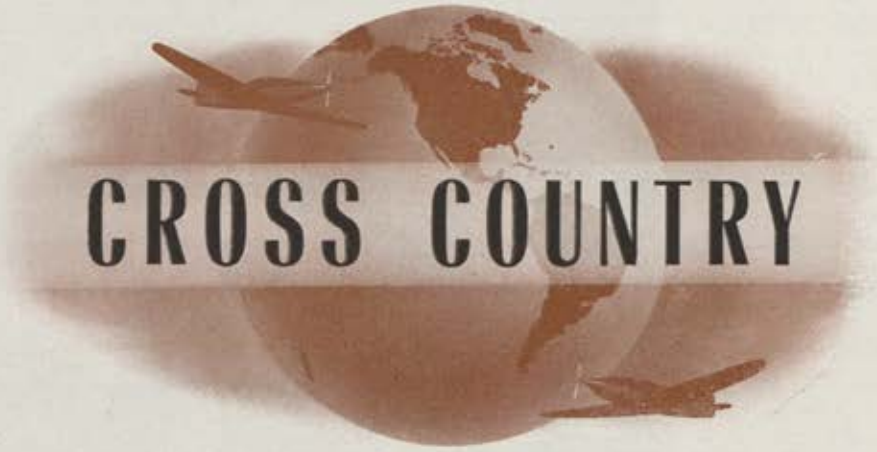
AIR FORCE

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

APRIL 1944

Backbone of our striking power against Hitler's Europe are the thousands of ground men who work around the clock to keep our bombers and escorting fighters in the air—men like this crew chief and mechanic who are shown clearing the cylinders of a P-47 at an airfield in Britain. For a profile of a ground crew "boss" in England, see "24-Hour Job" in this issue.



CROSS COUNTRY

BECAUSE the troop basis for 1944 requires a sharp reduction of activities in the zone of interior, the Army Air Forces must, in the words of General Arnold, "increase the output per man on all jobs on each post and station."

In a February 7 letter to the commanders of all continental air forces, commands and stations, the Commanding General declared: "Personnel will be transferred to units destined for assignment overseas. The training and servicing job in domestic commands must be accomplished with fewer personnel and the flow of men and equipment overseas must not be diminished."

He called for a continuation of current efforts to reduce overhead and housekeeping activities in order to meet the "critical obligation" facing the AAF in 1944, adding: "There is no excuse for 'luxury personnel' at any AAF installation. There must be no idle personnel on a station waiting for work."

The Commanding General specifically ordered reduction of personnel engaged in overhead and training functions, and the replacement of general service men with those who are limited physically.

"Success of this program requires initiative and superior performance on the part of every officer and man in the Army Air Forces," he wrote. "I expect no less from all."

Today the AAF must look to increased efficiency through better deployment of tactical or technical skills. As Brig. Gen. J. M. Bevans, Assistant Chief of Air Staff, Personnel, put it, "Where we now have three men to do a job, there will be only two. Sometimes there will be only one."

The AAF strength overseas will be built up greatly this year. Men must be supplied largely from continental activities since the AAF intake now is limited to replacements for actual losses. It follows then that for every man added to our theatre forces, a man must be taken away from a station at home.

The problem is pointed up just now by the demands of the program for very heavy bombardment, which will require large numbers of men this year. There will be no increase in AAF manpower for this undertaking; thousands must be squeezed out of existing activities.

All steps are being taken to eliminate functions which can be spared. Many men are being taken out of training and made available for use immediately. Some schools are being discontinued and, wherever it is feasible, on-the-job training is being undertaken. To achieve maximum utilization of manpower, commanders are asked to assign additional duties to all personnel whose time is not now fully utilized.

"The most effective duty assignments combine full use of available man hours and the substantial utilization of military occupational specialties in which personnel are qualified," says General Bevans. "For instance, a special purpose vehicle operator can be assigned appropriate additional duties when he is not operating a crash truck or wrecker. A draftsman can be assigned additional clerical duties when he is not at his drawing board. A machinist can be assigned mechanic's work to fill out his time. In effect, there is no longer any 'fat' in our personnel picture that will allow specialists to be idle while they wait for work in their specialty."

WEATHER VANE

Unless it be a window full of cuckoo clocks, there is nothing busier than the nervous gadgets at a weather observer's station. There are whirling psychrometers, theodolites, self-synchronizing wind vanes, three-cup anemometers and thermographs and, for that reason alone, we have always shown the greatest deference and respect for weather-men.

Naturally we were surprised and a little let down to learn that an AAF weather-

FRONT COVER

Airmen of two races—members of the Chinese-American Composite Wing of the 14th Air Force—gather around a briefing table in this month's front cover photo. See Page 19 for details on the Wing's work.

man at one critical period had relied on a rheumatic donkey for his forecasts. Lieut. Col. F. A. Kluever, a front line weather officer, has revealed that at one time in Africa there was such a scarcity of weather equipment he came to depend implicitly on this crippled donkey which would bray well in advance of approaching rain. The colonel has described the method as "unscientific—but in that case accurate."

No Right Sleeve Patches

Personnel authorized to wear the shoulder sleeve insignia of a separate air force or command are prohibited from wearing the AAF shoulder patch on the right shoulder of the uniform under terms of AAF Regulation No. 35-11, dated 25 February 1944. The AAF shoulder sleeve insignia should be worn on the left sleeve, one-half inch below the top of the shoulder seam, by all AAF personnel except those authorized to wear the insignia of a separate air force.

Deadly Headwork

There are more ways to kill a cat than to drown him in butter, and 10th Air Force pilots in India do not stand on ceremony when they polish off a Jap. Recently two American airmen have been credited with disposing of enemy planes in rather novel ways.

When Capt. Sydney Newcomb, commanding officer of a fighter squadron, got a Zero on his tail he hit the deck and began pruning the shrubs and foliage, but the Jap hung on close with guns blazing. Suddenly a Burmese pagoda loomed up in front and Newcomb held the nose down until the last split second, then yanked back on the stick and zoomed over it. The Zero, not so quick at the stick, tried to clear the pagoda and failed. The result was a rather loose mixture of Jap and pagoda.

Another instance is that of Lieut. William T. Larkin, B-24 pilot who tried to get back into formation with a badly shot up plane while a Jap I-45 made a pass from just below 12 o'clock. Other planes were holding the fire of his gunners so Larkin dipped the nose of the Liberator and fired his fixed .50s. The Jap winged over and trailed a feather of smoke and flame until it crashed. Larkin was credited with a confirmed kill.

Stud Duck

It was in the early days of occupation of a bitterly contested island in the Solomons that two AACS officers made their hot and weary way from the installations they were setting up alongside the bombed and rebombed mat to the headquarters of the Island Command. There was too much confusion to waste time with correct procedures when things had to be done on a scene that was little more than a beachhead. The two officers, principal actors in this drama, were clad in nothing more than trousers and shoes. One wore a long hunting knife in his belt like a bad mutineer. They were in a rush to complete their job since the station had to be on the air the next day to start bringing in tactical planes. Consequently, they were in a heated discussion of these plans when they approached the only screened quonset hut on the entire island. The two AACS men approached the hut without paying much attention to its other occupants.

"This must be the shack, let's get going," said the one with the knife, and they entered without knocking. His companion led the way and was somewhat struck by the appearance of one individual who had something on his collar that certainly was no accident of the laundry. The thing was broken out all over with silver stars. Before the leading visitor could make warning outcry, however, the other had unsheathed his weapon and, with a fine display of marksmanship, whizzed the knife across the room and made it stick quivering in the middle of the center board.

"Who's the stud duck around here?" the knife-tosser demanded.

It took all the persuasive power and

A six-minute blitz by Fortresses of the 15th Air Force blasted harbors and factories at Pola, Italy, 226 miles northeast of Rome, an important German submarine base and shipping port. This raid early in January did heavy damage to submarine pens and other installations in the dock area. Some of the bombs are shown heading for the harbor, while others are bursting on the target.

diplomacy of one of the senior officers in the hut to calm down all the high rank. However, he did bring them under control when he told them of the excellent work done by the men of the AACS.

On the following day when the two AACS officers walked by the quonset hut they saw a modest little sign on the door which proclaimed the person inside to be the "Stud Duck" of the island. Since that day a well-known admiral has had that sign on his headquarters wherever he happened to be.

Bronze Star

The Bronze Star, newest decoration for action against the enemy, takes precedence over the Air Medal and the Purple Heart. It can be awarded to anyone in the Army, Navy, Coast Guard or Marine Corps who distinguishes himself "by heroic or meritorious achievement or service, not involving participation in aerial flight," according to an explanation given by Robert P. Patterson, Acting Secretary of War. It is expected that Ground Force troops may lead the eligibility lists, although it is entirely possible for flyers to win the Bronze Star—but not in the air.

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Always With Us

Our unshakable confidence in the innate kindness of sergeants has been bolstered again. This time it takes the earthly form of Sgt. John Love of Base Squadron Supply, Walker Field, Kan. Sergeant Love recently went home on furlough, expecting to spend two weeks in a restful little garden just outside of Nashville—two weeks away from web straps, high shoes, tin troughs, stencils and everything that is the Army.

The sergeant arrived home in good order, birds sang and skies were not cloudy all day. The first night, however, was filled with hurrying feet and raucous voices. Love investigated and found that the Army was having maneuvers all around him, and no small part of that force had been assigned to toss a theoretical enemy out of his own backyard. Love tried not to notice, but it was too much. The night got blustery, cold rain fell and the sergeant's heart was touched with compassion. He put on the big pot and served coffee and cakes to the soldiers who were just outside his window. The Army remained until the day before Sergeant Love returned to duty.

The Long View

We have heard the highly adaptive story of a flyer who had been stationed on an island for many months and had taken a lively part in the social life of the place. During his stay he had become much enamored of a half-native girl who, from all accounts, was very beautiful. One day he was growing warmly poetic in his enthusiasm for the young lady, while his buddy was thumbing through a movie magazine. The disinterested party had heard about enough of this raving when he suddenly turned to a fine example of Hollywood beauty in a brief bathing suit.

"How's this?" the buddy asked, holding the magazine before him. The love-stricken pilot took a brief look and snorted:

"White trash!"

The Last Mile

This department would be derelict in its duty if it failed to give some mention to War Department Circular No. 60, dated 10 February 1944. The War Department has titled it: "PER DIEM—REIMBURSEMENT TO OFFICERS FOR SUBSISTENCE EXPENSES INCURRED IN CONNECTION WITH TRAVEL PERFORMED WITHIN CONTINENTAL LIMITS OF UNITED STATES IN COMPLIANCE WITH ORDERS ISSUED ON AND AFTER 1 MARCH 1944." This ponderous thought, however, can be digested into: "No More Mileage."

Circular 60, in a few brief paragraphs, lays away a custom of the service that is almost as old as travel by rail. Puttees, high-collared blouses and campaign hats came and went, but mileage carried on forever—until March 1, 1944.

Briefly, the circular provides that orders directing travel and temporary duty of commissioned officers (including officer personnel of female components) flight officers and warrant officers of the Army, within the continental limits of the United States, will not specify the method or rate of disbursement.

It further provides that a payment of a flat per diem is the only authorized method of reimbursement for subsistence expenses incurred in temporary duty travel with the exception of travel performed in connection with permanent change of station, when, in most instances, mileage will be allowed.

Consolidation

Transfer of the AAF Eastern Technical Training Command headquarters from Greensboro, N. C., to St. Louis, Mo., and disbanding of the AAF Central Technical Training Command was effected March 1 to bring about an economy in administration. Under this new alignment the seven major installations of the central area will become part of the eastern command, and two stations, formerly under the eastern, are transferred to the Western Technical Training Command at Denver.

For th' Birds

Ground crews at Greenville Army Air Base in South Carolina sound like Macs you'd enjoy knowing. Here is a note the night maintenance crew left for the day crew of the 471st Squadron recently:

"Awake sparrow in the right rudder of ship number 9873 before pre-flighting."

A Blend

At times we have given way to pleasant contemplation of that wondrous place in fable, the big rock candy mountain. There is something utilitarian about beef steaks that grow on bushes and a place where Vat 69 trickles cool and abundant from the rocks. However, we have dozed into nothing quite so fanciful as a story which has just reached us from loyal friends of Capt. Robert Howard, mess officer at one of the AAF installations in the CBI Theatre.

This strange thing occurred last New Year's Eve when Captain Howard decided that the day should not go unnoticed. Feeling that there must be a lad or two

A GI conception of the B-29.

—SGT. G. ADAMS AND CPL. S. CHARLES, AFTAD

Bombs from B-24s drop on Frankfort on the Main during one of several heavy poundings to shake this important German industrial and transportation center early in February. In this attack, 800 heavy bombers, accompanied by hundreds of fighters, dumped 1,800 tons of bombs on the target, an AAF record to that date. We lost 31 bombers and 13 of our fighters were missing; 103 enemy planes were shot down during the attack.

in the outfit who would like a drop before his supper, the mess officer got together a big supply of native whiskey which he blended with fruit juices and syrup. From time to time the concoction was sampled by some of the wiser among the kitchen help and at last it was pronounced fit for a general.

Since there were several squadrons involved and it appeared likely that a majority of the lads might like a touch, the problem of serving the liquor came up to puzzle Captain Howard. Looking about the kitchen it was decided to use the giant vat from which soup was ladled, a decision which seemed to solve everything. Naturally the medics were consulted and they proceeded to toss a half-hitch around the whole happy affair. Native whiskey, acid fruit juice and an aluminum tub might create such a chemical disturbance that the insides of all celebrants would resemble neglected storage batteries, the doctors decided. Anyway, no chances were to be taken.

At that point the hero appeared. The whiskey, syrup and juice were poured into a Lister bag, and from its four spigots the lines fanned out like spokes of a great wheel.

Never before, and for all we know never since, has a Lister bag so well filled in for a wassail bowl.

There were no casualties.

Plasma on the Fly

Because a flight surgeon insisted that his men know how to give blood plasma in flight, an airman's life has been saved by this means in the Central Pacific theatre, dispatches advise. Lieut. Andrew A. Doyle of Brooklyn, a bombardier-navigator, was in danger of dying from loss of blood and shock when he was given plasma as his plane raced back from bombing a Jap base in the Marshalls.

Capt. Lowell Ladd Early, squadron flight surgeon, had insisted that plasma could be used to advantage during flight and his instructions were followed by Lieut. August Mizaroff of Plainfield, N. J., co-pilot, and Sgt. R. V. Smith, Jr., of Charlotte, Va., engineer-gunner. By the time the B-25 reached the nearest American base Doyle, injured in the legs, was feeling much stronger and responded readily to further treatment at the field hospital.

Training Record

The AAF Training Command has revealed facts and figures on the training program which heretofore were treated as confidential matters. The report shows that 100,799 pilots, 20,086 bombardiers, 18,805 navigators, 107,218 aerial flexible gunners and 555,891 ground and air combat crewmen were graduated from the command's nationwide network of schools from 1 January 1939 to 30 November 1943.

In 1939 there were 696 pilots graduated from two flying schools, while in the first eleven months of 1943 the command graduated 61,730 pilots of all types from 135 schools. The increase in the production of technicians is no less spectacular when it is considered that only 14,803 were trained in the twenty years preceding 1941.

A tribute to the maintenance crews, most of them graduates of the technical schools, is the fact that during the eleven months ending 30 November 1943 Training Command students flew an average of 25,600 hours between each fatal accident.

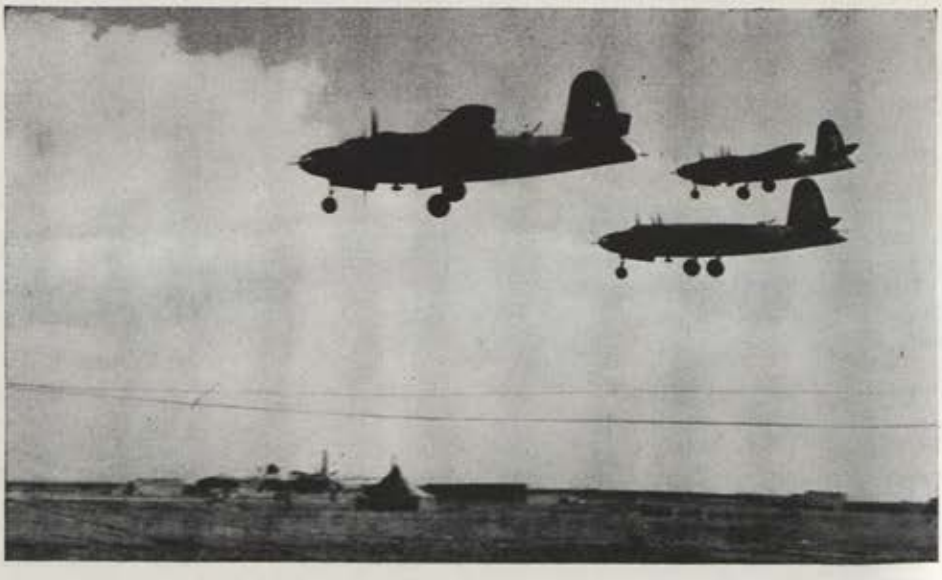
Unsung

In countless air battles the records can never reveal the great gallantry of the guys who go down in action. A case in point is the story of an unidentified soldier, now missing in action, who is reported to have shot down at least ten Nazi planes before his own B-17 was destroyed by enemy fighters during the attack on Munster, Germany, last October.

The missing soldier apparently was the ball turret gunner of a plane, also unknown, although his shooting has been reported by Staff Sgt. Everett W. Lewis of Yellow Springs, Ohio, left waist gunner on the B-17 Situation Normal.

"I'm not sure what Fort it was since several went down together and others took their places to keep the formation tight. But I saw at least ten German planes explode nearby, and all apparently were destroyed by that fighting Fortress on the left. All the other Forts were to the right of this one so I'm sure it shot up all the Huns I saw explode—and I repeat there were at least ten. They came in from the left and up from below, toward that ball turret. Each one blew up just before reaching it."

Three-at-a-time take-offs and landings are a specialty with Lieut. Col. Joseph R. Holzapple's 15th Air Force B-26 group, oldest medium outfit in the theatre. Working without mishaps for more than twenty missions, this tricky flying is not for show. Three abreast take-offs give an estimated range extension of fifty miles, and save the equivalent amount of precious gasoline.



SNAFU BUT FUNNY

A young radio operator on a transport flying the Hump to China was given orders to radio ahead that the ship was bringing in a complement of two lieutenants and twelve enlisted men to be stationed with the 14th Air Force for rations and quarters. This message was sent in code and our radioman screwed it up rather thoroughly.

After it had been deciphered at the China airbase the intelligence officer had a message which led him to believe that the ship was bringing in twelve members of the State Department and two visiting ambassadors. In consequence of this information the plane was met by General Chennault and a coterie of important Chinese officials. Instead of protocol and diplomatic gestures, however, the first thing the reception committee saw was a dozen GIs tumbling their barracks bags out of the plane. When the intelligence officer, barely escaping this shower of equipment, asked about the state officials on board he was given a rather suspecting glance by the pilot and told to stop the humor because the GIs and the lieutenants were hungry and wanted to eat.

When the truth of the fumbled message came out the intelligence officer was thrown into such a fury that he commanded the quivering little radio operator to explain the whole sorry affair to General Chennault.

With every ex- *(Continued on Page 64)*

PARACHUTES: LOST AND FOUND

Lost:

Nos. 42-140129, 42-229808 seat-type; return to Base Operations Officer, Fairmont Army Air Field, Geneva, Neb.

No. 42-662988, return to Sub-Depot Supply Officer, 398th Sub-Depot, Laurel Army Air Field, Laurel, Miss.

Nos. 39-30, 41-7952, 41-19775, 41-24837, 42-128591, 42-466077; return to Parachute Officer, Luke Field, Phoenix, Ariz.

Nos. 42-222909, 42-45422, 42-45436, 42-222910, 42-22959, 42-22935, 42-22937, all type S-1; return to Office of the Engineering Officer, 51st Air Base Squadron, Eglin Field, Fla.

No. 42-288686, return to Operations Officer, AAF Pilot School (Basic), Majors Field, Greenville, Texas.

No. A.C. 42-2426, return to Operations Officer, Orange County Air Field, Santa Ana, California, and notify R. F. Loughmiller, Lieut, Col., M. C., Surgeon, Hobbs Army Air Field, Hobbs, N. M.

Nos. 42-291994, 42-291995, 42-292031, 42-291964, 38-2281; return to Base Operations Officer, FAAF, Florence, S. C.

No. 42-9835, return to Curtiss-Wright Modification Center, Cayuga Road, Buffalo 5, N. Y.

Found:

No. 42-303510, seat type, left at 6th Sub Depot, Bainbridge Army Air Field, Bainbridge, Ga. Drop Test Card shows this chute was packed at 348th Sub-Depot, Casper Army Air Field, Casper, Wyo., March 30, 1943.

No. 42-648262 is held by Curtiss-Wright Modification Center, Cayuga Road, Buffalo 5, N. Y.

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BRIEF

DEPARTMENTS

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AIR PINCERS OVER EUROPE

By Maj. Arthur Gordon
Air Force Overseas Staff

History may well disclose that the last stand of the German Air Force began in February, 1944. An air arm which cannot supply itself with replacements is doomed. In February, Nazi fighter production received such a hammering from the air that, for the first time, it failed to keep pace with the attrition of the Luftwaffe.

Those who like precise dates may choose either February 20 or 22 as a critical moment. On February 20 the greatest daylight aerial assault in history was launched from Britain. Nearly 2,000 planes of the 8th and 9th Air Forces struck the German aircraft industry in eight widely separated areas. The next day another great force continued the attack. On the third day, bombers of the 15th Air Force roared up from the Mediterranean to add their bomb tonnage to the weight being dropped simultaneously by the British-based heavies.

This closing of aerial pincers was the final outcome of long planning and careful preparation on the part of the U. S. Strategic Air Forces in Europe. To any thoughtful German, it must have looked like the handwriting on the wall. In these three days, with more than 4,000 American aircraft attacking, with American heavies dropping over 5,000 tons of bombs and with the RAF adding some 3,000 more at night, the air war over Europe moved into its most violent phase.

One hundred and seventeen American aircraft—94 bombers and 23 fighters—were lost; 310 enemy fighters were reported destroyed in the air, plus a considerable number on the ground. Weary from combatting the RAF's shattering night attacks on Leipzig and Stuttgart during the same period, the Luftwaffe fought back with its usual skill and courage but showed definite signs of grogginess. At USSTAF headquarters, staff officers, who remembered a similar climax in July, 1943, prayed for a few days of clear skies. "Give us the weather," they said, "and our combat crews will finish the job."

It was back in February, 1942, that the first AAF officers arrived in Britain. A year later, in February, 1943, the American air effort in Europe was still pathetically small. The 8th Air Force consisted of about a half-dozen groups of heavy bombers, and when they managed to put 100 planes over a target in Germany, it was without any fighter escort.

Now the picture has been altered so radically that it is not easy to focus it clearly. The expansion has been so great that the result at first glance seems to be a bewildering jumble of British and American air power, of strategic and tactical and expeditionary air forces whose names are likely to change overnight and whose operational and administrative affiliations defy analysis.

Such is not actually the case. The organization wherein the 8th, 9th and 15th Air Forces are cooperating with one another and with the RAF in the pre-invasion softening of Germany is practical and very much to the point. It is still, however, in a state of crystalization and further changes are to be expected.

The backbone of American air power in Europe is the 8th Air Force, whose

fighter and heavy bomber commands now match the RAF in size and striking power. Under command of Maj. Gen. James H. Doolittle, the 8th Air Force now forms one wing—the British-based wing—of Lieut. Gen. Carl Spaatz' Strategic Air Force. The other wing of the USSTAF is the 15th Air Force, based in Italy, under the command of Maj. Gen. Nathan Twining. General Spaatz exercises operational control of the 15th Air Force through the Mediterranean Allied Air Force, under Lieut. Gen. Ira C. Eaker, but the distance from Britain makes administrative control difficult and much of this remains in the Mediterranean.

The combined operations of these two air forces against German aircraft factories on February 22 were initiated at General Spaatz' headquarters in Britain, and they provided the first example of how these two spearheads will function as one weapon, bringing the pressure of strategic bombing to bear on the enemy from opposite directions. Our tactical air power in Britain is wrapped up in the plans of the invasion forces, all under command of General Dwight D. Eisenhower, Supreme-Commander of the Allied Expeditionary Forces. The Supreme Headquarters of the latter is referred to as SHAEF.

Directly under SHAEF is the Allied

How our air organization in the ETO is drawing the noose around the Luftwaffe.

Expeditionary Air Forces. AEAF is the joint British-American force under command of Air Marshal Sir Trafford Leigh-Mallory, with Maj. Gen. William O. Butler as deputy. Its mission will be to furnish air cover and support for the forthcoming invasion of Fortress Europe.

Currently, the AEAF is composed of two tactical air forces, the British 2nd and the American 9th. The official announcement on February 18 that the 9th was in Britain surprised practically no one, inasmuch as shoulder patches of personnel had been visible for weeks all over England. Well known as the air force whose tactical aircraft harassed Rommel across the sands of Africa and whose heavies struck the Ploesti oil fields last summer, the 9th retains some of its old personnel. Its commander is still Maj. Gen. Lewis H. Brereton; its bombers are mediums taken over from what used to be the 8th Air Force Air Support Command. In addition, it is rapidly building up a powerful striking force of attack bombers, fighter-bombers and fighters. It includes a Troop Carrier Command with paratroops and gliders carrying Airborne Infantry, all in a state of pre-invasion training.

Not that the 9th has been content with waiting for D-day. During the intervening months its B-26s have struck across the Channel as often as weather would permit, blasting Nazi airdromes and marshalling yards and concentrating particularly on military installations which Prime Minister Churchill finally identified as emplacements for rockets or glider bombs. Marauder losses have been very low—eighteen bombers in approximately 7,500 sorties—thanks to close support from RAF Spitfires and the fact that the bulk of German fighters have been forced back to defend Germany proper. In addition, the 9th has been sending out long-range, hard-hitting P-51s and P-47s to escort the 8th Air Force heavy bombers and furnish target support on deep penetration missions. One Mustang group in 28 combat missions has destroyed 115 enemy fighters with a loss of only 19 Mustangs, outmaneuvering and outfighting every type of German fighter at altitudes ranging from practically zero to more than 25,000 feet.

Despite the valuable contributions made by the Marauders and long-range fighter escorts provided by the 9th, the salient feature of the winter air offensive has

Air trails lead these days to all parts of Europe, from fortified coasts of Holland and France to factories deep in Bavaria. These B-17s are on their way to Brunswick, a key in Germany's inland water-way system and scene of aircraft industrial plants. On the opposite page, B-24s are shown flying over the Pas de Calais area, which has been pounded heavily since the first of the year.

been the Allied effort to smash the German Air Force by crippling its production centers on the ground. In the early days of the 8th Air Force's activities, much was made of the spectacular claims of fighters destroyed by bombers in aerial combat. This attrition of the Luftwaffe was undeniably valuable but the emphasis was misplaced. As long as the Germans could make good their losses—and total German twin-engined and single-engined fighter strength was steadily rising—they could afford their casualties. What they could not afford was serious damage to their fighter factories, sheltered for the most part deep within the Reich.

On January 11 the grand assault began with daylight attacks on Oschersleben, Brunswick, Halberstadt and other key production centers. The cost was heavy that day—59 bombers—but the Allied Command was willing to pay an even higher price if necessary, to break the Luftwaffe's back. In the next six weeks the bombing blows seriously crippled more than fifty percent of the German factories that were producing Nazi fighters on January 11. This was the most significant aspect of the air war, perhaps of the war itself. This was the goal toward which the AAF and RAF had been pointing for more than two years. This was the realization of detailed plans made months before—plans that had been awaiting the necessary planes and weather before they could be carried out.

Losses during these six weeks were not as heavy as expected. Through February 22, 8th Air Force heavy bomber losses were 2.2 percent of aircraft dispatched. This compared favorably with the overall loss of 3.1 percent of all aircraft dispatched since the first operational mission of August 17, 1942. It compared brilliantly with the worst month, when losses ranged over 6 percent. For the same period, February 1 through 22, our fighter losses were 0.8 percent as against an overall figure of 0.7 percent. Considering the fact that in the first 22 days of February more sorties had been flown by the 8th than in any previous full month —nearly all of them deep penetration missions—losses were astonishingly light.

There were three main reasons for this.

Lieut. Gen. Carl Spaatz

Maj. Gen. William O. Butler

One was the immense and cumulative strain on the Luftwaffe. An exchange of letters between Air Marshal Harris and General Spaatz corroborated this growing weakness. The RAF lost 79 aircraft in a terrific battle over Leipzig on the night of February 19-20. On the following day, with our main attack centering in the same area, American losses were only twenty-one. That night the RAF attacked Stuttgart in great strength, losing only ten. Obviously German defenses were stretched to the breaking point.

The other two reasons were the increasing skill and experience of bomber crews and the inestimable value of long-range fighter escort, with hundreds of P-47s, P-38s and P-51s shepherding the bombers, usually providing complete cover to and from the most heavily defended targets and target support as well. German fighter attacks on bomber boxes could not develop to any effective degree. More and more, German defensive tactics seemed to call for the use of twin-engined rocket-carrying fighter-bombers—ME-110s, ME-210s, ME-410s, JU-88s and JU-188s. These aircraft, standing out of range of the bombers' machine guns, attempted to cripple Fortresses or Liberators by lobbing rocket projectiles into formations; then ME-109s and FW-190s would jump stragglers.

Rocket carriers proved no match for our fighters. One reason for the amazing score registered by Mustangs, Thunderbolts and Lightnings — better than four-to-one in some groups — was the fact that unless rocket carriers were provided with top cover of their own they were shot down in droves. The air war was resolving itself into a devil's merry-go-round where rocket carriers attacked our bombers, our fighters attacked the rocket carriers, and German fighters awaited a chance to pounce on crippled airplanes whenever the opportunity presented itself.

The only conclusion possible to a close observer during the last part of February was that the Allied air chiefs were going all out for the kill. Not even the urgent requirements of the Anzio beach head were being permitted to interfere with the planned destruction of the Luftwaffe in the air and in the nest.

Once the curve of German fighter production started downward—and it has started—it was imperative to maintain the pressure; to give the Germans no breathing space, such as they were granted last summer, in which to rest tired men and rebuild shattered factories.

Every lesson of modern warfare points to one inescapable conclusion: mastery of the skies is a prerequisite to the invasion of Europe. As these words are written, somewhere in England, that mastery is being achieved. ☆

Lieut. Gen. Ira C. Eaker

Maj. Gen. Lewis H. Brereton

Maj. Gen. James H. Doolittle

Maj. Gen. Nathan Twining

HAMMERING THE JAP MIDRIFF

This scene of destruction at the Taroa island airdrome in the Maloelap Atoll is typical of recent 7th Air Force operations against key Japanese bases in the Marshall Islands. Overcoming heavy fighter opposition, B-24s laid an accurate bomb pattern on the service apron, repair area, hangars and shops of this important interceptor base.

The Taroa attack was part of a plan to neutralize enemy resistance from all other Marshall bases while amphibious forces, protected from the air and sea, landed successfully on Kwajalein and later on Eniwetok.

Beginning in December, when our newly-acquired bases in the Gilberts were consolidated, five enemy installations in the Marshalls—Jaluit, Mille, Maloelap, Wotje and Kwajalein—were subjected to almost daily attack by airplanes of the 7th Air Force. In the missions against Mille and Jaluit, B-24s and B-25s were joined by A-24s, P-39s and P-40s. It was the first time that our Central Pacific attacking forces included medium bombers, dive bombers and fighters, previous major operations in this area having been outside the range of any except heavy bombers.

Immediately before the January 31 landing on Kwajalein, B-24s flew a number of successful night bombing missions, guided by fires started during the day by bombing and shell fire. When the landings were made, the 7th Air Force flew in almost continuous support.

By-passing other islands, where Japanese power had been reduced by 7th Air Force and carrier-based planes and bombardment by naval surface vessels, amphibious forces landed on Kwajalein and Eniwetok with small losses. With United States forces thus established in the Marshalls and in the nearby Gilberts, it became increasingly difficult for the Japs to supply the Marshall bases they still held.

Kwajalein and Eniwetok are great prizes. As the Gilbert conquest placed us within easy bombing range of the Marshalls, so the Marshall success has placed us within easy bombing range of the eastern Carolines, including Truk. ☆

THIS IS YOUR ENEMY

Nazi Reprisal Raids ☆ ***Jap Torpedo Bombings*** ☆ ***Tojo's Favorite Drama***

DESPITE recent Luftwaffe activity over Britain, which has been stepped up greatly, observers assert that Allied air power, increasing daily, has forced the German Air Force to concentrate on defensive tactics at the cost of its own power to attack.

Beginning the night of January 21-22, the GAF undertook a series of reprisal raids against London and other British population centers. The nature of these attacks and the German propaganda that accompanied them made it clear that they were intended primarily to bolster the sagging morale of Berlin and other hard-hit German cities.

In some cases, the GAF striking force was so small that no more than nuisance value could be expected of the attacks. Usually, when larger forces were used—and these forces were small by comparison with those of the Allies attacking German targets—relatively few got through the British defenses.

Many types of German aircraft—fighter-bombers as well as bombers—were observed in these renewed GAF efforts. There was little apparent effort at concentrating bombs on specific targets; bombs were dropped wherever it became necessary or convenient to drop them.

For propaganda purposes, each of these attacks against Britain was intended to avenge one of Germany's blasted cities, and the raids were appropriately named. For example, one would be hailed by the Germans as the "Hamburg raid," another as the "Schweinfurt raid," another as the "Bremen raid."

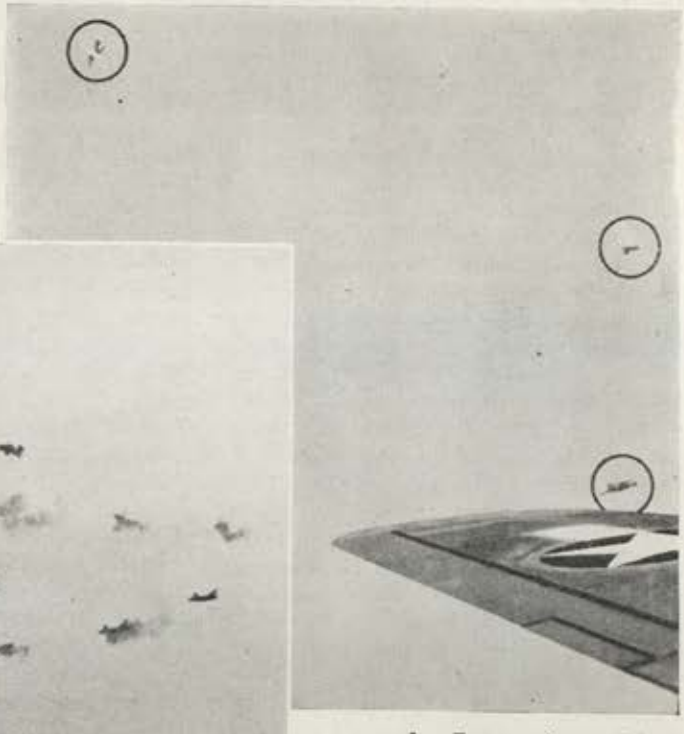
Until this series of attacks, there had been but little German effort since March, 1943, to retaliate for the terrific blastings given Berlin and other cities.

To review GAF offensive activity for 1943:

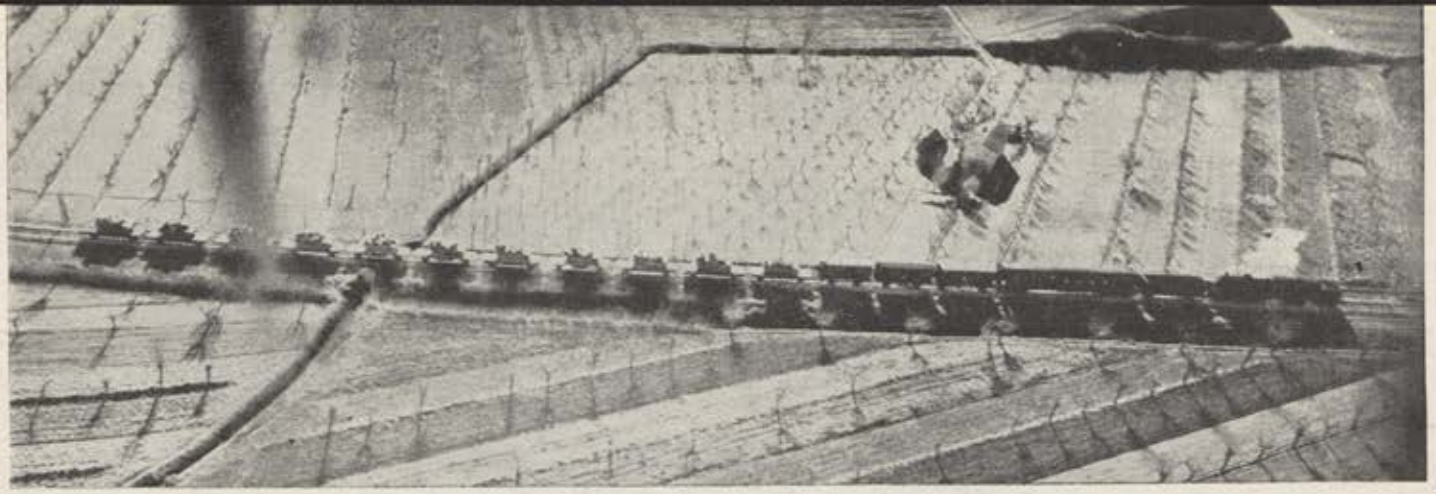
From January to March last year, there were several low-level, hit-and-run raids on British coastal towns, and an increase in mine-laying activity. Many reconnaissance flights were made over England, too. After a heavy raid of four-engine British bombers over Berlin in the middle of January, the GAF, stung to activity, attacked London with about 75 aircraft, of which about 30 reached the target. Eight German planes were destroyed. This was followed a couple of days later by a mid-day raid of about 60 fighter-bombers, of which only 12 reached East London. Fifteen raiders were destroyed and the Germans gave up that style of attack for the rest of the year. There was an increase in night activity in March, and a reprisal raid on London after Berlin had been hit by 300 heavy bombers. Little damage was done.

In April, the Nazis started a new tactic, sending the FW-190 as a fighter-bomber at great height on nights the moon was shining. The first time they tried it, of the twelve FWs, four tried to land peacably at a British field. Two got down all right, a third crashed, as did the fourth which cracked up when people at the field, in a quite successful prank, turned off the landing lights just as the wheels were about to touch the ground. Two other attempts to reach London were made by pairs of FW-190s, and minor nuisance raids of this sort were carried on in moonlight periods for the rest of the year.

LONG range tanks were put on the Focke-Wulfs in May and they attempted to penetrate deep in England. This stunt eventually caused the end of the hit-and-run tactic because the ratio of casualties increased rapidly. Between May 1 and June 6, when the hit-and-run activity ceased, 43 of 274 aircraft which took part in 16 raids were destroyed. On the last four large raids, 21 out of 77 were knocked down.



Near Rudesheim on the path to Frankfort on the Main, ground defenses have opened up with accurate anti-aircraft fire against this B-24 formation. A photographer in one of the bombers attacking the German transportation and industrial city caught this vivid picture of what was happening to the Liberators. At right, a B-17 is blasted by flak in another raid. The tail surface is shown in flames at top left; in the center circle is a wing section, and below it, the fuselage and other wing.



Taking advantage of Italy's rail lines from the north, German forces send supplies quickly to their armies opposing the Allies on several fronts. An AAF photo reconnaissance pilot made this picture of a train-load of Mark III tanks being hauled to points near the Adriatic Sea.

In June and July there was only casual activity, and in August there was a slight increase in night attacks. Intruder operations were stepped up in September, and by October there was quite a lot of night raiding. November ran along about the same as October, and German activity fell off considerably in December.

Silent Joes

Japanese naval aviators have strict rules on radio silence. Use of the radio in a combat area is even forbidden for reporting movements of enemy units unless "friendly units are in imminent danger." Flight and formation leaders in Japanese combat groups rely almost entirely on visual signalling. They use pieces of cloth tied to an upraised arm, or else rock their wings. There have been cases of Japanese flyers in trouble who still did not attempt to make radio contact with their bases.

Double Talk

Some fellow on radio Tokyo reached a fine conclusion recently. He said: "The standard language of East Asia should possess three attributes: First, it must carry the cultural and spiritual tradition of all East Asia; second, it should be the language of a nation which can lead all the world; third, it should be a language of superior quality. On this basis the Japanese language may be described as most suitable."

Decks Awash

A "double-ended" fuel barge, which can be loaded so its top deck is awash or slightly under water is being used these days by the Japs. The advantage of having the barge a little under water is that it is far less vulnerable to strafing attacks. The barges are towed by tugs or small ships.

Japs at Night

After losing quite a few medium bombers in daylight attacks on our shipping, the Japs have turned to making torpedo attacks at night, dusk or dawn. They have developed good coordination between float light and flare dropping planes and the attacking force. Several of their night attacks have been exceptionally skillful.

The usual pattern is for them to send out a snooper plane which finds and then tags along behind one of our task forces. Once the trailing plane has established the course of the ships the Japs intend to attack, flares are dropped parallel and perpendicular to the course and the attack group then closes. Colored flares are used to tell the different kind of warships.

The number of planes used in attacks has varied greatly, from five to as many as thirty.

Tail Gun

Mortars have been placed in the tails of several Japanese medium bombers. Dinahs and Sallys in the Southwest Pacific and in China have been using the weapon. Fighter pilots report seeing mortar-type explosive missiles fired back from the Jap planes, and it looks like the same sort of shell used in the Japanese 70 mm ground type barrage mortar. The initial burst of each projectile is followed by secondary bursts.

Sucker Tricks

It can't be said too often that the Jap is a clever, tricky fighter. For example, here are a couple of successful baiting jobs he pulled in the CBI theatre:

Jap bombers came over a certain field one day, and all our personnel scrambled for their slit trenches. The Japs, however, dropped only pamphlets, and went on. Our men, suddenly of a literary bent, climbed out of their trenches and began reaching for the paper which was fluttering down. The raiders then wheeled around and really plastered the field on the second run, catching and killing a lot of our personnel out of their protective trenches.

Men at another field had been plagued for weeks by a Photo Joe who came over at high altitudes nearly every day. He got on their nerves. At this particular time, P-40s couldn't get up high enough to go after him, so they stripped one fighter down to give it more altitude. The next time the reconnaissance plane came over, the stripped P-40 took after him and shot him down. A few days later, another Photo Joe came over and all the fighter pilots at the field, pleased about what happened to the first Jap, climbed in their P-40s and went after him. The reconnaissance plane started running. While our P-40s were chasing him merrily, a big flight of Jap bombers came in and let go on the unprotected field. Smart planning by the Japs—and a very small show of brain work on our part.

Whistle While You Work

The Nazis are using a new kind of whistle to indicate withdrawal from positions held during battle, a tactic they have been employing quite extensively of late. Aptly, the whistle makes a sound like a low moan.

Hollywood is Where You Find It

This is the plot of a Japanese play, produced recently and reviewed in a broadcast from a far eastern station. Feeling a little weary now, we present it without comment:

"The play dealt with frantic efforts of the U. S. administration to keep from the American world the truth contained in Imperial Headquarters communique on the last battle off Bougainville. Scene One was a telephone conversation in which Halsey reports to boss Knox the disastrous results, which Knox at first mistakes for U. S. victories. When he realizes his mistake, the decision is taken to spend some more millions of dollars to keep the story secret. Scene Two shows a South American newspaper correspondent, who has picked up the communique, haggling with Harry Hopkins over the price at which he will refrain from sending the story to his paper. Hopkins has to give in to all the terms demanded, and has to pay the $65,000 in gold as demanded. The last scenes are set in Mexico, whither some American has smuggled a copy of the communique, sacrificing his life in the gallant effort to tell the people the truth . . ." ☆

Notes from the Air Surgeon's Office:

A Battle Plan TO FIGHT MALARIA

MALARIA is a most important military problem, requiring consideration right along with questions concerning operational tactics, enemy facilities and supply. Every man in the AAF has a personal responsibility to understand the importance of the disease and to keep it from putting him out of action.

In many of the air forces, especially those operating in the tropics, malaria at times has reduced the number of effective men twenty to fifty percent. In a few places nearly all of the men in a squadron have become casualties because of malaria. This loss of manpower delays offensives, upsets timetables, drags out the war. In avoiding malaria, our men may be able to shorten the war considerably by the simple expedient of having more healthy fighting men in the field than the Nazis and Japs.

Malaria occurs in almost every theatre in which the AAF operates. North Africa, Italy, the Balkan States, the Middle East, India, China, Burma, Malaya and the South and Southwest Pacific theatres are scourged with malaria today as they have been for centuries. Even in those air forces in which the disease is not normally found, it is not to be regarded lightly since planes and men from malarious areas may be flown in.

Malaria is important to each man in the AAF because the chances of his getting sick with malaria may be five to ten times greater than his being wounded by enemy strafing, bombing, bullets or flak.

Malaria is no respecter of rank, and it can strike the strong and hearty just as hard as the weakest.

In every military operation it is of great importance for the soldier to know the characteristics of the enemy. Nobody would consider attacking a Zero or a Messerschmitt without knowing all he could about its fighting abilities. In the same way, you must know your enemy when you fight malaria. That enemy is a mosquito—the Anopheles. The only way you can get malaria is by its bite.

These are characteristics of the malaria mosquito. It is a night fighter-bomber. It attacks almost exclusively at night, but especially at dusk and again about dawn. It may sometimes bite even in daytime, in dark places in the jungle or in dark tents and buildings. This mosquito is loaded with the "germs" of malaria which it sucks from the blood of some person (usually a native) sick with the disease. These "germs" are the ammunition carried by the mosquito. Its ordnance supply is almost unlimited because, unlike ordinary bombs or machine gun ammunition, the "germs" multiply in the mosquito so that it can carry ammunition enough to attack a great many objectives without reloading. There is also an almost unlimited supply of natives who have malaria and from whom the mosquito can load up again.

The mosquito hides during the daytime, usually near human beings whom it will attack the following night. It hides in dark places under eaves, in corners, under desks, tables and beds. It hides in brush and tall grass.

The malaria mosquito's reserves are almost unlimited. The mosquito breeds in water—in almost any kind of water such as ponds, irrigation ditches, flowing streams, brackish marshes, collections of water in tire ruts, footprints, coconut shells, tin cans, tires, shell cases and all sorts of small containers. The female mosquito lays hundreds of eggs every few days. Unless a thorough attack can be made on the mosquito enemy, its reinforcements are practically inexhaustible.

A successful offensive against the malaria-enemy must have these objectives:

(1) Air superiority—to drive the mosquito out of the skies.

(2) Destruction of reinforcements—by wiping out the mosquito's breeding places.

(3) Lengthening enemy lines of communication—by locating camps and fields out of mosquito flight range.

(4) Setting up a perfect system of interception—to prevent the mosquito from biting.

Every man, from the Commanding General down, shares in the responsibility for attaining these objectives. Commanding officers of every grade have the greatest responsibility in controlling malaria, not only because the regulations say so, but because the fighting effectiveness of their command may be directly affected by the presence of malaria among the men. It is the responsibility of every officer in the command to make certain that each man understands and applies the control measures necessary for protection against malaria. Medical officers are responsible in the largest measure for advising the commanding officer and for supervising the measures of control.

THE program for conquering malaria is divided into two parts: (1) unit operations—large scale control measures by specially-trained anti-malaria units, and (2) individual measures—personal control by each man (and woman) regardless of rank.

The responsibility for *unit control* lies with the commanding officer. In many places, special squads are available for carrying out some of the engineering control measures. In other areas where these special units are not available, it is the duty of the squadron commander and the surgeon to carry out whatever measures are possible.

To gain "air superiority" efforts must be made to kill the mosquito before it has a chance to bite healthy men. This is done by strafing the enemy on its home ground before it can take off. In regions where malaria is common, native houses in the neighborhood of camps should be sprayed often. In these places the mosquitoes load up their ammunition of malaria "germs" by biting natives sick with malaria. Buildings and tents on the post should be sprayed every evening and every morning to kill all mosquitoes hiding there.

Spraying with insecticide all planes coming in from other theatres is another unit responsibility that rests right on the CO's shoulders. Mosquitoes hitch rides in planes, and malaria may be brought to a field—and to a country—if these hitch-riding mosquitoes are not killed. Yellow fever, dengue or filariasis as well as malaria mosquitoes may be imported in planes. Brazil has spent millions of dollars over many years to rid the country of a breed of malaria-carrying mosquito brought in by boat from Africa.

The second objective, to destroy enemy reinforcements by preventing mosquito breeding, is accomplished by:

(1) Filling ponds and collections of stagnant water; draining swamps; cutting vegetation from the margins and banks of streams.

(2) Organizing and supervising details to police the field for collections of water in all forms of refuse; controlling traffic to avoid unnecessary tire ruts.

(3) Organizing and supervising units to spray collections of water which cannot be drained or filled. The spraying may be done with a mixture of Paris Green and road dust, and blown by a hand or mechanical sprayer from the windward side on to the water. Other materials besides Paris Green may be available.

(4) Oiling water which cannot be drained or sprayed adequately.

In order to lengthen enemy communication lines, camps and flying fields should be located at least one mile away from swamps and, especially, from native villages which are the chief sources of malaria infection. Whenever possible, camps sites should be located on high, dry ground. One of the primary steps in setting up an effective interception system is to see that adequate screens are placed in windows and doors of barracks and other buildings. In areas where malaria is very common, screen doors should be double and set about six feet apart so that a trap will be formed between them. Doors must open outward. All cracks in buildings should be sealed because mosquitoes come through even a very small hole.

It is obvious that all unit control measures cannot be applied all of the time. In smaller units at advanced fields it may be impossible to apply any of the measures, especially in the first few days of occupation.

UNIT control measures go a long way toward beating malaria, but the responsibility of the commanding officer does not end at that point. In the last analysis, the effectiveness of an anti-malaria campaign depends on the protective measures applied personally by each individual against the mosquito. If a man avoids its bite he is safe from malaria.

The most important individual measure for protection against malaria is proper use of the bed mosquito net every night. It is just as important to take care of the net as it is to prepare a slit trench properly. Bombers may come over irregularly and they may do great damage, but the malaria mosquito comes over every single night on its "blood run." The mosquito is intercepted chiefly by proper use of the net.

The protective net should be set up every night about half an hour before dusk. The inside should be examined for the presence of mosquitoes before going to bed. If mosquitoes are inside, the net should be sprayed with insecticide spray. After getting in bed, the individual should tuck the bottom of the net under the blankets or mattress. Any hole in the net should be sewed up or mended with adhesive tape before the man goes to sleep. In the morning the net should be neatly folded over the support at the head of the bed, or else taken down altogether and folded carefully, in order to prevent tears in the net.

Long-sleeved shirts and long trousers should be worn at night, from about half an hour before sunset, even if it is excessively hot. The mosquitoes are unlikely to bite through sleeves and trousers.

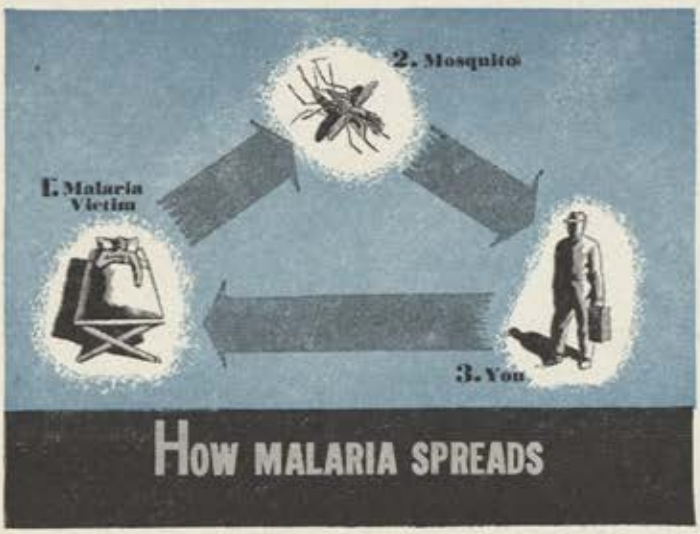
GI repellent should be used by all personnel who are exposed at night, such as guards, movie audiences, men working on the line and pilots and crew on night missions. Repellent should be applied to hands and faces and to the parts of clothes which are tight on the skin especially around the shoulders and seat. The repellent lasts for several hours. It should be applied carefully and no part of the exposed skin missed except immediately around the eyes.

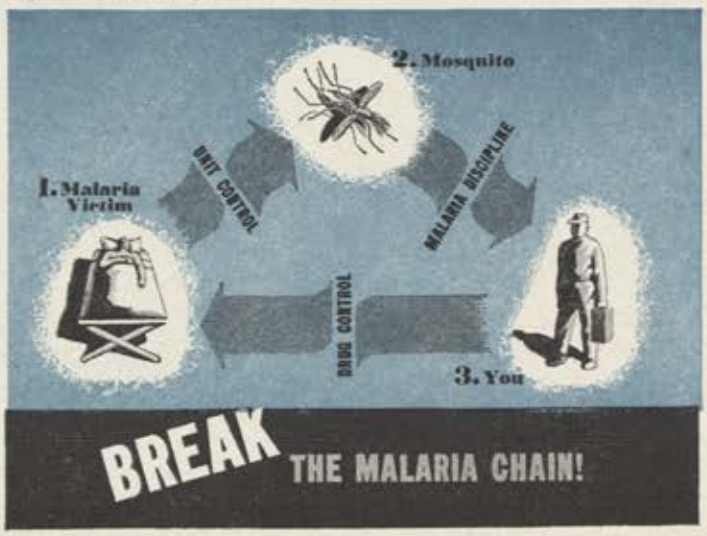
In some areas where malaria is especially common, men whose duties require them to be out at night may be ordered to wear headnets, gloves and mosquito boots. These may be uncomfortable and it may be hard to see through the net, but the protection is well worth the trouble. The use of a head net will not be ordered unless absolutely necessary.

Atabrine is given personnel stationed in areas where the chances of getting malaria are very great. This drug will not prevent an attack of malaria but will postpone it so that a man can keep going. There are no serious ill effects from taking atabrine, and it has no effect on a man's ability to fly. Because atabrine is a dye, yellow coloring may appear in the skin. This is not a dangerous condition but on the contrary, it may be an indication a man is receiving full protection from the drug. The discoloration disappears when the drug is stopped.

The only good thing about malaria is that the Japs and Nazis get it in the same theatres we do. We can lick them, and we can do it more quickly if we keep malaria under control. ☆

To aid in the fight against malaria, a series of posters is being prepared by AFTAD, in collaboration with the Air Surgeon and the Arctic, Desert and Tropic Information Center, for distribution to field units. Two of the posters are reproduced below.





Plaster casts do not keep hospitalized patients from taking the carefully supervised scientific exercises that are an important part of the AAF's Convalescent Training Program. Wherever possible, classes such as this one at Miami Beach, are held outdoors.

LEARN WHILE YOU HEAL

By Charlotte Knight AIR FORCE Staff

Exercise, too, even for those who must stay in bed. Muscles not used waste away and joints grow stiff. So some form of mild muscle reconditioning begins the day a patient stops running a fever. Exercises are graduated according to patient's recovery stage.

The AAF's Convalescent Training Program means faster recoveries and a broader military knowledge for hospital patients.

As old as the Army is the GI gripe over going to an Army hospital. Soldiers have claimed you never get out unless you know a couple of Congressmen.

They have had a point. The average stay in an Army hospital is about twice as long as it is in a civilian hospital for the same illness. But this is not without reason. When you leave a civilian hospital after — say, an appendectomy — you go home and spend a few days or weeks lying around the house taking it easy before you go back to work.

Not so in an Army hospital. Until recently there was no place in the Army for that in-between stage of slow recuperation. Result: you stayed in the hospital itself until you got your discharge papers—which meant you were ready for *active* duty.

Very often this also happened: After a certain length of hospitalization you were given your two-week convalescent furlough before returning for your final discharge. You started home and perhaps you had to stand, in a weakened condition, on a crowded train or bus for hours. Once home, what you did in that two weeks may not be what the medical officer had in mind. Parties, lack of sleep, strenuous activities may retard your physical progress and not infrequently you returned to the hospital in worse shape than when you left. So in you stayed for another stretch.

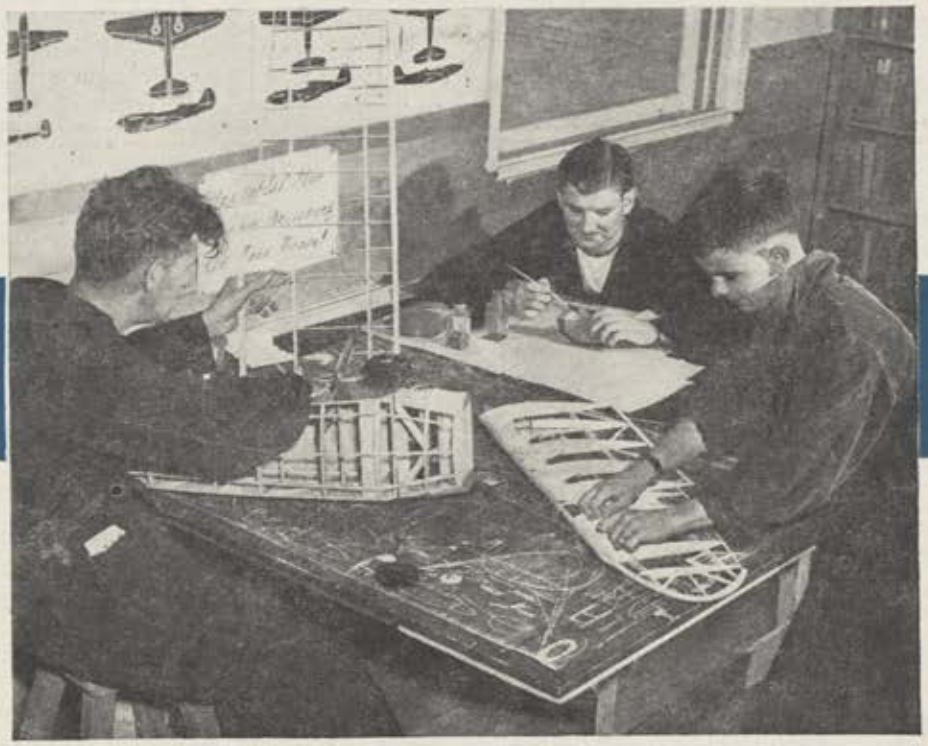
The boredom of an Army hospital didn't speed your recovery either. You were restless, impatient, thoroughly disgusted, and you wished for something to do besides lie in bed and count nails in the ceiling.

At least that's the way it *was*. But thousands of men in the AAF, who have been hospitalized within the last year for anything from an infected foot to double pneumonia, have an entirely different story to tell. Hospital times have changed.

To tell why and how, the story must go back to December, 1942.

The Air Surgeon's office, aware of all the thorns in the traditional system, decided it was imperative that the AAF's hospital program be geared to the progressive ideas in operation elsewhere in the Air Forces. Two facts had become too apparent to be dismissed: first, there was an appalling wholesale wastage of time and valuable man hours in all our hospitals at a period when we could ill afford to lose that time; secondly, a patient's psychological condition had a profound effect on his physical recovery—a man kept interested, alert and active will certainly get well faster than one who is bored.

This challenge was tossed out to a group of AAF medical officers by Maj. Gen. David N. W. Grant on a visit to the station hospital at Jefferson Barracks, Mo. Lieut. Col. Howard A. Rusk, chief of medical services at Jefferson Barracks at that time, went to work on the problem. With an unqualified go-ahead from the hospital's commanding officer, Col. James R. McDowell, Colonel Rusk assembled a small staff and began work on a training and reconditioning plan for the AAF's hospitalized men that grew in less than a year to a vast Convalescent Training Program which at the present time saves more than two and a half million man hours per month in the AAF.



Available time in AAF hospitals is put to constructive use. These GI patients at Lowry Field, Colo., banish dread hospital boredom and learn useful skills at the same time. Keeping patients interested helps to speed recovery.

The launching of the program was as unorthodox as the plan itself. Colonel Rusk sent "stooges" to spread the word around in the wards at Jefferson Barracks. They purposely used a negative approach.

"What these brass hats won't dream up next to make life miserable! Listen, fellas, I just heard they're going to make us *work* all the time we're in this dump. And I heard something about having to go to lectures and watch training films and a lot of that stuff. As if that weren't bad enough, they're going to cancel our convalescent furloughs."

This was dark news indeed to those GIs who make hospitals a favorite place for gold-bricking and equally disconcerting to those patients who resented the intrusion of a training program into their prescribed routine of reading comic books and sleeping the days away. But Colonel Rusk got the reactions he wanted. No matter how the plan was presented, most of the men were in favor of it. Their attitude was that no matter *how* bad it was it would be better than the mental fatigue they had been suffering.

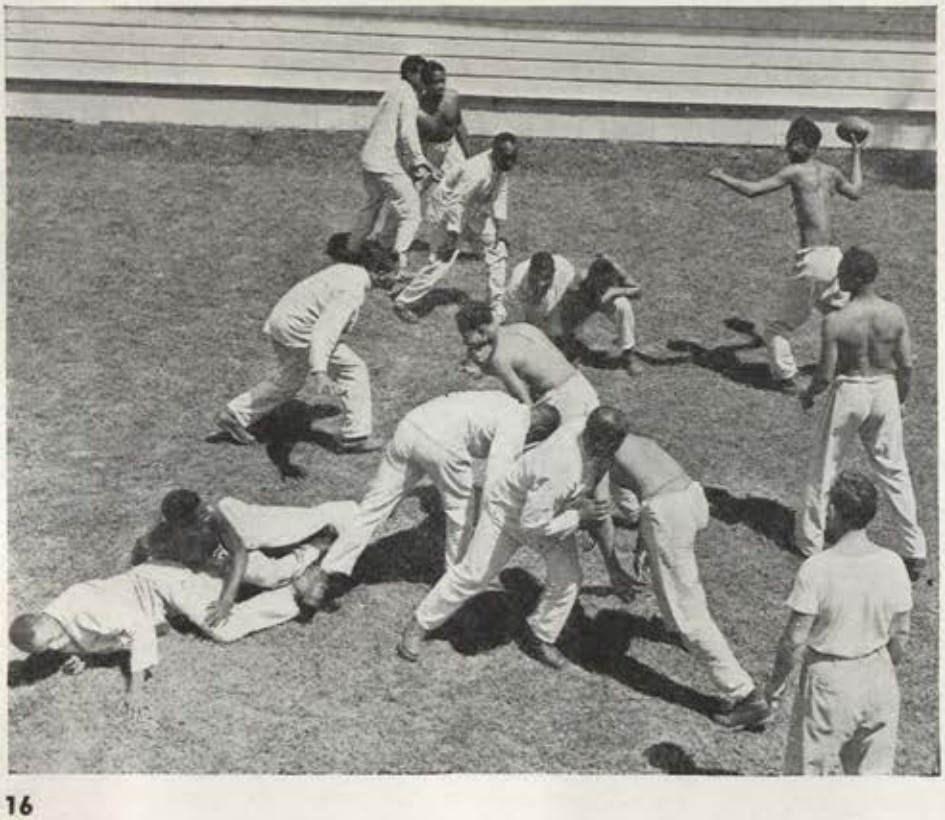
The original CTP staff in 1942 consisted of Colonel Rusk, Lieut. Raymond C. Lewis, a former adult education specialist, Sgt. Lorin C. Hawkes and Sgt. Donald MacInnis. Doubling in brass at first as directors, physical education leaders, lecturers and teachers, they tried out their ideas in the wards of the hospital. The ideas paid off. A report went back to Washington and two weeks later a directive from General H. H. Arnold ordered the establishment of the CTP in all AAF hospitals. Before the end of 1942 it was in actual operation.

Two objectives are paramount in the CTP: To recondition sick soldiers physically by a carefully planned and executed physical rehabilitation program and to utilize heretofore wasted convalescent time with educational instruction in subjects of importance to all soldiers regardless of the branch of the AAF they may be serving.

Already the result of these ideas, unique in military medicine, has been to:

If the soldier-patient can't go to the CTP classes, the classes are brought to him. Some form of military training is going on in wards of AAF hospitals almost continuously these days. Code, aircraft recognition, mathematics and a host of GI subjects are included in a flexible curriculum. Time goes faster for this patient engrossed in making a camouflage net at Jefferson Barracks hospital where the Convalescent Training Program originated. More than 20,000,000 man-hours have already been saved for the AAF since the program started in all Air Force hospitals.

Soldiers leaving hospitals must be returned to duty in fighting shape. To keep them up to par, CTP gives convalescents as much action—both calisthenics and games—as their condition permits.



(1) Reduce hospital re-admissions, by as much as 25 percent in some bases, by sending men back to duty in better physical condition.

(2) Shorten the period of convalescence in certain acute and infectious and contagious diseases by as much as 30 to 40 percent. The average internment for scarlet fever, for example, has dropped from 33 days to 23, that of virus pneumonia from 45 to 31.

(3) Eliminate in the majority of cases the necessity for convalescent furloughs.

(4) Increase vastly the soldier's military knowledge and his general knowledge of geography, geopolitics, foreign languages, tropical diseases and the like. In addition it has enabled medical officers to practice preventive neuro-psychiatry by establishing a series of "patient-doctor" talks of great assistance in the soldier's orientation to new conditions.

Walk into the typical ward of the average AAF station hospital and you will notice cards of red, orange and green at the foot of the patients' beds. These are the "signal lights" indicating varying degrees of illness. A patient with a red card is not allowed to get out of bed. Nevertheless, if his temperature has been normal for one day, he can still take mild finger, hand, arm, head and neck exercises although he's flat on his back. Men bearing orange cards can get out of bed for ten minutes of mild muscle reconditioning. Green cards indicate the patient can have the works — full, vigorous calisthenics three times a day.

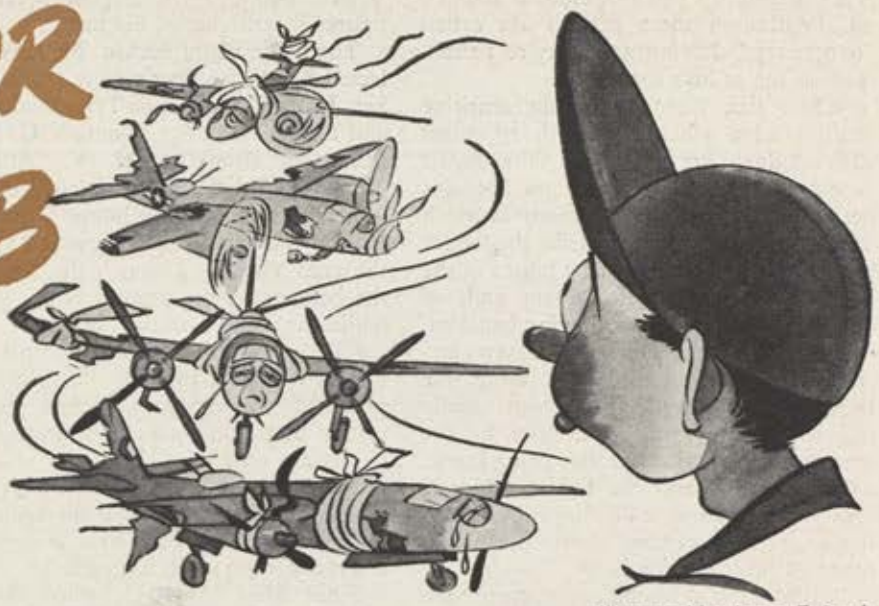
Incidentally, the ward nurse also finds practical value in this simple color system. She can tell at a glance who is able to help with routine ward jobs, such as cleaning windows, scrubbing floors and no back talk, either. Green cards mean an hour and a half of ward fatigue daily.

Special classes for orthopedic rehabilitation, under the direction of the orthopedic surgeon in charge and the physiotherapist, are also in continual operation in the hospitals.

Some hospitals have camps to which ambulatory patients requiring long and slow convalescence are sent. Training at these centers is modified to meet the physical limitations of the convalescents and new recruits who are sent there to be brought up to par. These camps serve much the same purpose as a baseball team's spring training camp. They have reclaimed for further military duty many men who otherwise would have been lost to the service.

In addition to these local camps, eight convalescent centers for returned casualties have been established at Santa Ana, Calif., Buckley Field, Colo., Coral Gables, Fla., Jefferson Barracks, Mo., Maxwell Field, Ala., Pawling, N. Y., San Antonio, Texas, and Ft. George Wright, Wash. Each center has a carefully selected staff, includ- (Continued on Page 60)

24-Hour Job



By Maj. Bernard W. Crandell
8TH AIR FORCE

Illustrated by James T. Rawls

HE'S always cussing the B-26 and praising the B-17, which is explainable only because a man is sometimes critical of a thing he loves most dearly.

He swears he isn't interested in the four Marauders that he and eleven other mechanics must maintain. Not the least bit attached to any of them, he insists, as he carefully watches eighteen specks in the sky approaching the airdrome. Crew chiefs may take a personal interest in their 26s, but a flight chief treats them like a big, cold hunk of machinery, he repeats as the Marauder formation swings around on the approach leg.

"Watch this one," he suddenly gasps. "Watch it now. It's Pistol Packin' Mama! She's coming in right there. You got to take a look at that ship. Damnedest picture on it you ever saw. Old 'Nap' is paintin' it on and it's an old gal leaning against a rail with a big gun in her hand. He hasn't painted her head on yet—hasn't had time since the last Amsterdam raid. Been patching the damn thing up . . . turret dome busted, hydraulic system shot out, conduit in engine hit, oil dilution line hit by same piece of flak, hits on two leading edges, holes in two pieces of cowling, hole underneath pilot but it didn't come through, holes in the fuselage. . . .

"Pistol Packin' Mama! What a ship! Damnedest picture you ever saw! Come and take a look at it!"

Master Sgt. Jack Loving, the Marauder flight chief who looks at his ships in that coldly impersonal manner, also has the reputation at his base in England for being the "bitchingest" man on the line.

"Which is an indication," observes the group air executive, "that he's doing some thinking and feels fairly happy over the state of repair and maintenance on his ships."

Loving is an ordinary man from Beauregard, Miss., with an important job. The job consists of keeping four B-26s, each capable of dumping 4,000 pounds of bombs twice daily on Hitler's western fortress, in shape for such destruction of the enemy. It's up to Loving and eleven other air mechs to insure 32,000 pounds of bombs daily for Nazi Europe.

Grooming $1,000,000 worth of bombing machinery is a responsible business for a 21-year-old from Beauregard. Responsible enough to make it understandable that he might have a worry or two and a fairly vivid way of expressing himself when his four Marauders, looking more like sieves than flying machines, droop pathetically on the hard stands only twelve hours before their next mission.

THOSE next twelve hours, and the preceding twelve just spent sweating them through the last mission, are called the "24-hour jobs." This means it takes 24 hours of work, most of it under the feeble rays of worn flashlights, all of it through the penetrating cold of the English winter, to patch holes, to mend hydraulic lines, to replace electrical conduits, to hope and fret over four battle-damaged airplanes. Loving is never sure that they'll be ready for the next mission, and his eternal pessimism often disgusts his squadron engineering officer who tries to figure how many bombers can go down the runway the next morning.

The "24-hour job" is a misnomer for a night of wrestling with 34,000 pounds of intricate machinery. Because even after the mechanics have won their 24-hour match with the machines, they still have another eight or ten hours to sweat them out from the mission, and perhaps a repeat performance of the night before.

"We spent thirty-hour stretches on the line during the first days of October when they were going out every day," Loving recalls sourly.

The only Marauder on the field that was properly named, Loving thinks, is Flak Happy, of his flight. They've had some lively times with Flak Happy on the ground as well as in the air.

"One night after Flak Happy came home with the leading edge shot up in three places, and an elevator and rudder smacked by flak, we had an air raid," he relates. "We had to get the ship back in condition so we stayed out there with our flashlights, helped considerably by the light of the flares the raiders were dropping. Flak Happy got off the next morning all right.

"On the last Amsterdam raid it came back full of holes. One piece of flak went in above the bombardier's head, cut the cables to the bomb racks and the line from the air speed indicator. There was only a small strand left of the right aileron control cable and one large hole where the top of the left wing tip should have been. That time the ship had to go to the hangar for four days while the service squadron did the sheet metal work on the wing tip. At the end of four days everything else was fixed, too, and Flak Happy with its left wing nothing but patches went back for more action."

Patching is a fairly simple job, according to Loving. If the flak doesn't damage a structural member, a piece of aluminum is riveted over the hole. And if the hole

Sergeant Loving is an ordinary man from Mississippi with an important job in England. His mechanics work around the clock to patch holes, mend hydraulic lines, replace conduits and get those battle-damaged bombers back in the air.

is a small one, a patch of cloth is slapped on. Although these patches are called "temporary," Loving says they're permanent so far as he's concerned.

When flak hits the highly sensitive leading edge where hundreds of wires and conduits are imbedded, the repair becomes a major job. Birds are Loving's pet peeve because they do nearly as much damage as flak when they strike the tender leading edge. Similar touchy points in the B-26 are the hydraulic system and, of course, the power plants, Loving explains.

Loving says he and his eleven mechanics are seldom told what target the B-26s are attacking, but they can usually tell where the ships have been by the amount of battle damage they bring home.

"Amsterdam and the Calais-Boulogne area are the toughest on the ships," Loving adds. "Amsterdam always means another 24-hour job for us.

"Pistol Packin' Mama got it worse than Flak Happy on the last Amsterdam mission. As for the other two ships, 739 had only a few holes in it and 906 didn't get off the ground because the oil dilution solenoid stuck open and let fuel run into the engine—another damn 24-hour job. After we'd drained the engine and changed plugs and started her up, a cylinder head blew out and that was about the limit. We changed it, though, and had it ready by next morning."

Loving figures that, on the average, the crew chiefs and other mechanics in his flight spend between fifteen and twenty man-hours daily on each B-26.

"But after a hot raid, much more than that," he quickly adds. "If we have the necessary parts we stick with the repairs until we're finished. Those 24-hour jobs wouldn't be so bad if it wasn't so damn dark and cold."

The speed of repair and maintenance of the B-26s in England recently drew a commendation from the Air Force on the general condition of the bombers, a recognition that Loving and his flight were glad to get after having both Bomber Command and Air Force inspectors snooping around for three weeks.

Loving says the combat crews were as happy over the commendation as the ground crews, which was proof enough that the boys who fly take an interest in what the mechanics are doing. On that point, Loving is emphatic.

"The pilot on 739 and his crew take an unusual interest in what we do," he explains. "He is Lieut. Frank S. Barrett of Dallas, Texas, and the crew chief is Tech. Sgt. William L. Whitton of Austin, Texas. You might know what happens when you get two Texans together. Every time one of the combat men goes to London he always asks the ground boys if there's anything he can get them.

"We've put an awful lot of patches on old 739. It's been out on 29 missions and always gets back somehow. Lieutenant Barrett won't give it a name because he figures it will change his luck."

The name Pistol Packin' Mama was selected by the bomber's crew chief, Tech. Sgt. James T. Ratliff, of Tylertown, Miss., and his assistant, Sgt. Dominic G. Napolitano, of Brooklyn, N. Y. Although Marauders usually are christened by their pilots, occasionally the honor is taken by the crew chief because, Loving explains, the crew chief is as much the "boss" of the bomber on the ground as the pilot is while the plane is in the air.

"The crew chief can red line his Form 2-A at any time to keep the ship on the ground," Loving says. "And that's a matter that would take a command pilot to declare otherwise. The crew chief can red line his ship, but I'm always there when he's ready to take it off again. I'd never turn a ship back to a pilot until I am ready to go up in it myself."

Since May 14, 1943, when the Marauders made their first attack against Western Europe, Loving has seen a com-

plete turnover of the bombers in his flight. He lost two ships on the disastrous May 17 raid, and one since then. The latter was 817, the B-26 that carried him across the Atlantic to England. The loss of 817 along with its crew and one of the most popular pilots in the group, hurt the crew chief, Tech. Sgt. Antonio L. Vendrame, of Santa Barbara, Calif., considerably, Loving says.

"Tony hardly believed it when I told him 817 had been shot down. He now has 906, the 'command' ship that the squadron operations officer or the CO fly. Everyone likes Tony on that job."

Some of the other B-26s formerly in Loving's flight have gone to training or replacement centers. One of them was the Silver Streak, a B-26 without paint that had extra speed but at a distance either was invisible or reflected a blinding flash from the sun. Silver Streak, an old type Marauder with the 65-foot wing, made only one mission at medium altitude and had to be rolled into a hangar every night to conceal its brilliance, but it was held in high regard because it had gone for 350 hours without an engine change.

"That might not seem so much as when compared to some other airplanes," Loving says, "but a year ago we would have thought it was wonderful for a B-26."

In addition to repair and maintenance, the ground flight must make engine inspections every 25 hours' flying time and modify the new replacement aircraft. Modifications always bring another 24-hour job, for the bomber may be scheduled for its first mission the following day.

As flight chief, Loving finds his overall job only begins with his store of technical knowledge. Coordinating the work of four crew chiefs and the other mechanics into a well-balanced team requires more than technical knowledge, especially from a youngster who gives instructions to men eight and ten years older than himself. But Loving proved he had the respect of the men all along the line, according to the group air executive.

"I first heard of Loving when the boys said he was the hottest aerial photographer in the business," the air exec recalls. "A few weeks later they began talking of Loving as being the best aerial gunner they'd seen. The next thing was how good this Loving was at navigation, and then I heard he was an expert on radio. Finally they told me he was a top-ranking air mechanic. I decided to go out and get acquainted with him."

Loving's brief but rare background runs from his enlistment May 20, 1941, as a photographer—"because I was interested in chemical solutions"—to April, 1942, when his squadron was given its first Marauders and he decided to be an air mechanic. He learned it all on the line and takes some pride in the fact that he never went to air mechanics' school.

A flight chief can live a decent life—less than fifteen hours a day on the line—only when there are few missions during a month, Loving admits. The day a mission is run, however, is fairly easy. On the morning the bombers are to go out, for example, Loving and his ground flight will leave their Nissen huts as late at 0500, eat breakfast—"we've learned not to wait"—then go to the hard stands.

"We pre-flight the bombers, checking everything and giving the engines a run-up, and then top off the gas tanks," he says. "If the wings have frost we scrape it off with de-froster fluid. Then we might talk with the combat crew until they climb in. Someone starts the energizer, and that's about the last we do."

The last thing, of course, is the cool, indifferent stare of the flight chief as his four B-26s trundle off the hard stands and swing around the track to the runway. Then he might sneak over to a shed where old Nap is mixing paint to finish the picture on Pistol Packin' Mama, when she returns. ☆

CHINESE-AMERICAN COMPOSITE WING

By Capt. Robert V. Guelich
AIR FORCE Overseas Staff

BASED somewhere among the sugar-loaf hills of China is the Chinese-American Composite Wing of the 14th Air Force. There U. S.-built planes bear the twelve-pointed star insignia of China, carry bombs and gasoline from America and are flown by airmen named Wang, Tsao, Lo, Chin, Jones and Smith. This composite wing is a dream come true for Maj. Gen. Claire L. Chennault who sponsored the program to train Chinese air cadets in the United States where they learn our methods of aerial warfare.

Not only has China's new air force been successful in harassing the Jap communication lines to Burma and the Malay peninsula, but it also has met and bested the enemy in aerial battles. It has given effective aid to China's own ground troops by turning back the Japanese thrust westward in the Tungting Lake area last December. With B-25s and P-40s the Chinese-American squadrons bombed and strafed the area so heavily that 35,000 Jap troops were reported killed and Chinese ground troops were able to rally and retake thousands of square miles of territory, effectively turning back one of the most serious Jap threats to central China.

In this series of bombings, one co-pilot was dropping explosives on his home village where all his relatives lived, yet he had insisted on flying the mission. "If these bombs I drop kill my own family, but also kill some Japanese, my family and the rest of us will be better off," he had explained to the briefing officer. The Chinese have suffered much in their seven and a half years of war with the Japs and they realize that many more sacrifices must yet be made.

Before flying combat missions from China, the newly-trained cadets spent several weeks at the largest OTU in the Southeast Asia Comand where they were joined by veteran Chinese Air Force officers and by ground crews who had completed the excellent mechanics school course of the CAF in the Chunking area.

Although the squadrons originally were activated as provisional units of the AAF, a parallel command was established with Chinese officers. In this manner, the higher ranking Chinese Air Force personnel, who had not received flight training in the United States, were able to combine their operations with AAF tactics of seeking out and destroying the enemy. The duplicate staff organization was cumbersome at first, but it justified itself as each new unit gained experience and became independent of American supervision.

At OTU Chinese pilots from the States join American pilots and fly simulated tactical missions with mixed crews. Enlisted men of the Chinese Air Force take over gunners' posts while others learn to maintain and repair the new planes alongside American ground crews. Fighter pilots and bomber crews practice formation and cross-country flying, tow-target gunnery, strafing and skip-bombing. After several weeks of intensive training with experienced American personnel, the Chinese crews go out alone, thereby gaining the experience and confidence in their own flying and in their new equipment that is the prerequisite to successful tactical flying.

When able to operate independently, the crews fly their planes to China as new units or as replacements for the composite wing. The AAF personnel move up to the front and begin actual operations jointly with the Chinese combat crews and staff personnel. Such continuous cooperation is essential to coordinate the tactics of Chinese units with those of the AAF units flying missions with General Chennault.

On November 4, 1943, units of the new Chinese Air Force flew their first mission against the Japanese. With planes of another AAF unit, the Chinese-manned Mitchells flew a sweep far out over the China Sea. Three weeks later, six B-25 crews joined the AAF in the devastating raid against the important Shinchiku airdrome on Formosa Island. Thus, after years of defensive warfare, China was able to join the offensive action of the United

Chinese pilots have learned their lessons well and now are carrying the war to the Japs in coordinated offensive strikes with the men of the AAF. In B-25s and P-40s they are bombing and strafing ground troops, supply installations and shipping in the China Sea.

American commanding officer of the composite wing is Col. I. L. Branch who shares duties with Maj. H. Y. Lee. Major Lee, a graduate of the third class of the Chinese Air Force, 1932, holds a distinguished record of combat service.

States against the common enemy. November 4 truly marks an important milestone in the history of Chinese air power.

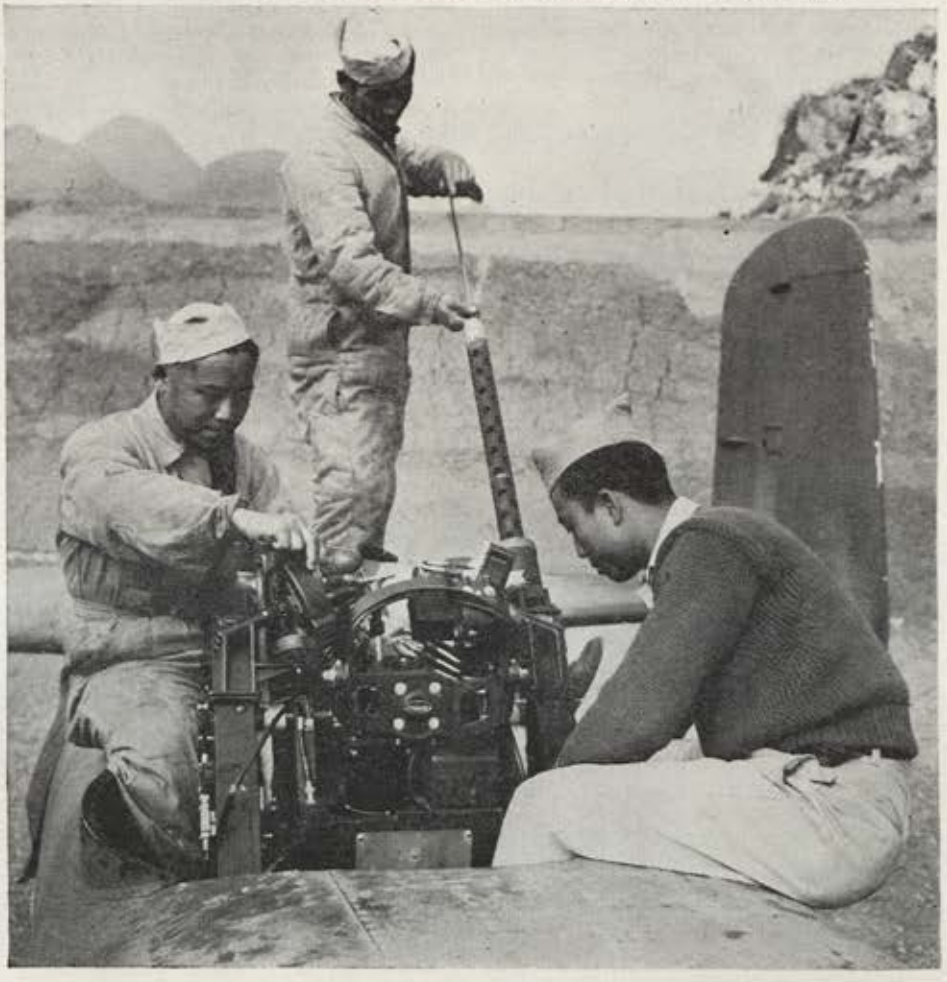
First blood was drawn on December 6 when a Chinese gunner on a B-25 shot down a Tojo during an air battle near Tungting Lake. On the day before Christmas, Chinese pilots won a fierce aerial battle over Canton, three of the flyers shooting down a Jap apiece. In the first two months of combat operations the bombers flew sixty missions. The fighters flew 200 sorties against the enemy in the first thirty days. Yet some of the Chinese pleaded for more flying and were disconsolate when they were not included on the roster of crews assigned for the next day's mission. The Chinese are eager to fight the Japs, sometimes too eager, and it has been a major problem for the American commanders to cope with them. Chinese have proved time and again that they can fly near-perfect formations, but they sometimes like to go out on their own. This inclination, to be sure, is common to all new pilots, and it is up to the more experienced American crews to restrain the eagerness of the new men.

During the comparatively short history of the Chinese-American Composite Wing's operations, probably the most important non-combat accomplishment in gaining prestige with the Chinese people came from a forced bail-out of a squadron commanding officer, and his crew.

The two Americans and three Chinese landed fifty miles from the Jap lines, and when they made their way back to a village, they were received with feasting and fireworks. Word spread rapidly that a crew of Chinese and American airmen had been flying together and wanted to return to their base hundreds of miles away. When the chairman of the province heard of this desire he left his local duties to provide a personal escort, and at every village on the long trip back to base there were celebrations, parades, public speeches and feasts. Gifts were showered on the men and they were questioned incessantly by pleased Chinese who wanted to know why they were flying together. The natives, of course, had often heard of American assistance, but the sight of these airmen walking together from a plane crash was indisputable evidence that Americans were actually flying with the Chinese.

This bail-out gave the three Chinese airmen an opportunity to tell the story of Chinese-American cooperation to hundreds of thousands of natives—how the men had been trained in the United States, how they had met and flown together in India and how they had been flying over these same villages almost every day in their bombing missions against the Japs. The new hope generated from this mishap did almost as much for the Chinese people as a military victory over the Japanese. ☆

When the job involves gun repair, calibration or adjustments American mechanics can frequently take lessons from the Chinese. Metal work is second nature to these men who seem able to feel tensile strength with their sensitive hands.



By assigning aircraft to Chinese crew chiefs, with American mechanics as supervisor-instructors, the wing's units have been able to keep their planes in commission at the time they conduct their programs of on-the-job training. These 500-pounders are marked for the Jap.

Off-duty hours presented another theoretical problem in original plans for a Chinese-American tactical unit. This problem, however, remained theoretical. Chinese officers live in barracks with American officers, enjoy the same recreational program and are bound by the same disciplinary regulations. As the men overcome the language hurdle they begin to know each other as personal friends and comrades in arms.

B-25s of the Chinese-American Composite Wing have piled up an impressive record against enemy shipping in the China seas. In protective revetments, beneath the colorful sugar-loaf hills, these bombers wait between missions.

BATTLE CONDITIONING IN THE U.K.

By Maj. Charles D. Frazer
AIR FORCE Overseas Staff

WHEN heavy bomber men arrive at a Combat Crew Replacement Center of the 8th Air Force they go through several days of training which is unique, vigorous and, perhaps, the most specialized in the AAF. It is a schooling for battle, a final prep for a tough assignment —air war in the European theatre.

This course has two purposes: to eliminate any operational flaws of individual crew members and to indoctrinate every man in the procedures and problems of the theatre.

While much of this training is classified, a description of subjects covered will indicate its breadth and value.

Three schools are operated by the 1st CCRC Group—one for B-17 crews, another for B-24 men and a third solely for gunners. They are large bases, complete with airfields, classrooms, American and British synthetic-trainer buildings and other facilities.

New crews assigned to a school spend their first two days together. Assembled in a lecture hall, they devote eight hours or more each day learning general information about the theatre which will fit them for active combat.

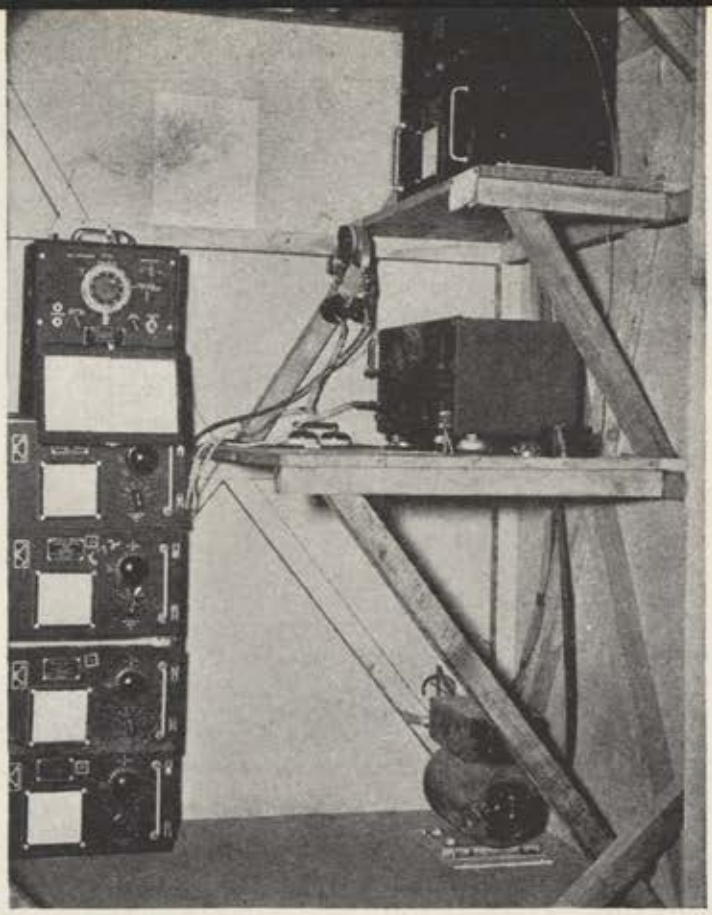
Take, for example, instructions in oxygen equipment and high altitude flying. Like all other lectures, these instructions are extremely factual and to the point. Every crew member is taught in detail the use of the A-14 mask. He learns how important it is to shave the night before a mission, because a heavy beard can cause a five percent leakage. He finds that he must guard carefully against a frostbitten chin, which can result from the collection of spit or sweat. He is advised always to carry two masks and is shown how to prevent cracks in the rubber and how to use a high pressure bottle—a vital matter.

Supplementing this data is a meticulous drill in the use of the British chest parachute, with which crews in this theatre are equipped, and high-altitude bailout procedure. The latter instruction emphasizes methods of making delayed jumps, the many reasons why they are advisable and the means by which they can be accomplished safely and surely.

Ditching and dinghy drill gets much attention. All the fine points of ditching are thoroughly covered, such as—in a B-17—the need for the top turret gunner to swing his turret forward so the pilot and co-pilot can reach up, grab the guns

Bombardment crew members arrive at a CCRC in England for their course in battle indoctrination. They spend two eight-hour days together in the classroom for instruction in a variety of subjects, ranging from the importance of shaving before going on a mission to naval craft identification. Specialized training comes later.

Following their indoctrination, gunners attend a special CCRC gunnery school to learn live firing, turret gunnery, the "zone system" and malfunctions of equipment. Every member of a bomber crew must learn to load and shoot—and shoot well.



AAF operators learn British radio procedures in the Harwell Box. Later in the course, radioman and navigator work as a team in a Grope trainer. The radio operator must learn to distinguish between faked and genuine communications.

and thus pull themselves out. There is, of course, description of the British Air-Sea Rescue System, with full details on "what to do till the doctor arrives."

An intelligence lecture of prime interest is that devoted to prisoner-of-war information and escape procedure. It is no accident that many American airmen have come home from parachute jumps or forced landings in Europe. They are taught how to do it before they take off.

The 'big league of air warfare' demands intense tune-up training of every member of a bomber crew.

ORIENTATION of a bomber crew naturally stresses intelligence topics. All flying personnel are familiarized with intelligence bulletins, strike photographs, the principles of photo-interpretation, enemy defenses, maps and the like. They learn that a large part of their job will be to gather information—"hot news," as it is called—as well as to drop bombs on German targets.

Recognition is strongly featured. Bomber men are taught to recognize friendly and enemy aircraft by a variety of methods—by movies, photos, charts, epidiascope and by blindfold procedure, in which the student must identify a small model purely by feeling its surface. Only those aircraft likely to be encountered in the theatre are taught, but each man must pass exacting tests.

Identification of naval craft is also important. Crews learn what mine fields look like and the distinguishing characteristics of friendly and enemy convoys, as well as warships. The activities of German E and R boats are thoroughly analyzed.

While it may seem unusual that in a school of this sort geography should have to be taught, it is an indispensable subject. Many men who think they know the map of Europe find that actually, they do not know it at all, particularly relative distances between countries. Nor do they realize how Europe appears when it is figuratively lying on its side—that is, when approached from England in the direction taken by AAF bombers.

To the new bomber crew, lectures on the German order of battle and the current war situation are obviously invaluable. Hence, the CCRC schools provide many instructional hours on the history and evolution of the German Air Force, its current strength and disposition, its newest planes and equipment, its abilities and weaknesses, its strategy and tactics.

Complementing all this information are summaries of targets recently hit by the 8th Air Force and the RAF and a general description of important industrial areas and targets which may be on the blackboard tomorrow. Day-to-day progress of the war in the European theatre and elsewhere, obtained by flash and TWX reports, is regularly imparted to the crews.

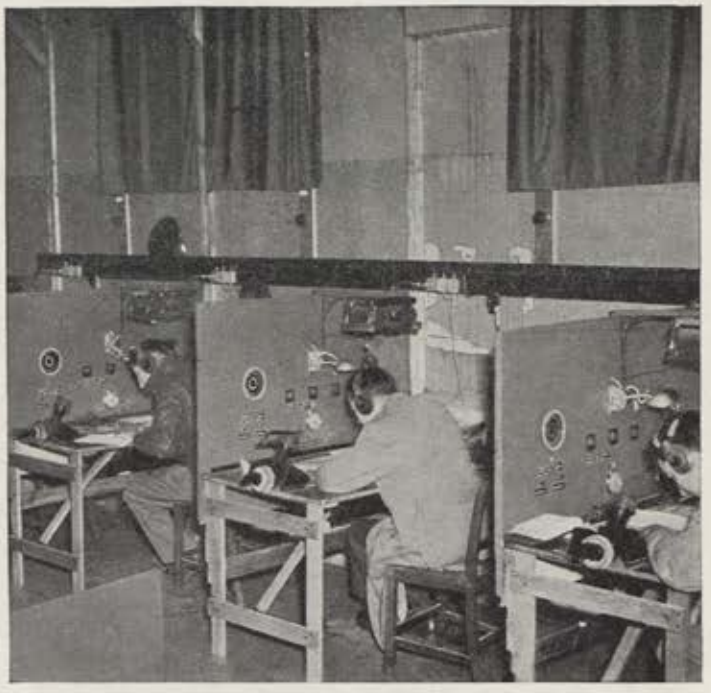
General theatre indoctrination cannot be accomplished in two days, of course. New bomber crews will continue to receive instruction in these and other subjects even after they leave the school and report to their operational groups. However, it is at the CCRC station that they are given an intense tune-up in fundamentals by AAF and RAF instructors.

Once the initial two days are over a crew splits up. All gunners go to the special CCRC gunnery school for many days' practice in all varieties of live firing, instruction in malfunctions, and a thorough knowledge of the "zone system" of firing now used in the European theatre.

Other crew members — pilots, navigators, bombardiers, engineers and radio operators — stay at the original CCRC school for specialized training. This is tough and rigorous. It is designed not only to acquaint each man with 8th Air Force and British procedures but also to correct any flaws which may exist in his ability to do his job. Even though he may have once been taught a subject a man can become rusty. The CCRC course brings him to his peak.

Each of these specialized courses is a

The bombardier soon learns the difference between a bombardier and a combat bombardier. While making his "runs" in this bomb trainer, an electrically operated device which provides air speed and drift problems, the bombardier is subjected to aircraft sounds, gunfire and simulated flak puffs.



Navigators get an operational test on their first day of specialized work and the results usually shock them into intense study and practice. In this DR trainer room, the navigator solves problems in dead reckoning. Practice in the use of the radio compass and airplot is also part of the curriculum.

blend of lectures, demonstrations and practice, with emphasis on the fine points of wartime flying.

Navigators and radio operators get a particularly rude awakening. A navigation student at CCRC receives an operational test on his first day of specialized work after which his attendance and attention at lecture are very earnest indeed. Dead reckoning is taught and practiced day after day in the class room and in the dead reckoning trainer until the navigator is perfect in its application. He learns completely the use of a radio compass—regarded as the most important aid in this theatre—and the airplot, which RAF observers use faithfully. In a device known as the Grope trainer, he rehearses radio navigation, map reading, use of certain British equipment, the making of a flight plan and keeping of a log.

When he and the radio operator are regarded as proficient, they take simulated flights together in this Grope trainer. To all intents and purposes, they must get an airplane to a given target and back again without difficulties. Later on, they will do this on high-altitude practice missions before going over Festung Europe.

The radio man, meanwhile, if he cannot take at least twenty words a minute, must practice until he can. He must learn British radio procedures via Harwell box which govern in this theatre. He must study in the Navigation and Security Trainer, which contains a large map of England mounted on a copper plate with all existing radio aids shown by small electric lights. He learns all about classified radio position-finding equipment.

When he and the navigator take their simulated flights together he gets all kinds of messages, faked and real, so that he will learn the difference and not be tricked in combat.

THE bombardier is not neglected. He sweats away in a trainer that soon teaches him there is a difference between a bombardier and a combat bombardier. While he may be adept at operating a sight, he may have forgotten some of his teachings on target location, bombing run procedure and computation for present data. If so, he learns them again. He gets navigational instruction. He practices his job for hours in the bomb trainer, an electrically operated device which provides problems of air speed and drift. Under the sight of this trainer is a turntable which is synchronized with the movement of the sight and which contains a map of the Ruhr Valley. The bombardier must select his targets on that map and bomb them. Moreover, he must do it with the ringing in his ears of aircraft sounds and gunfire, and a remarkable simulation of flak puffs. A bombardier also is rehearsed in the quick closing of bomb-bay doors after emergency release, the correction of a spring loading failure, the use of intervalometers and computers, and several methods of bomb salvo.

Pilots and co-pilots, while usually up-to-the-minute in operational efficiency, still must have a thorough grounding in instrument flying, in formations employed in the theatre, in high-altitude formation flying, British flying procedures and general airmanship and tactics.

Briefly, every bomber crew man is brought up to the mark demanded by the toughest air theatre in the world. All are given much gunnery, for it's been found that bombardiers and navigators, for example, are not proficient enough with the .50 caliber for successful combat.

The gunners themselves receive what amounts to a complete course—with practice and instruction in sighting, nomenclature, malfunctions, turret gunnery and maintenance. But all crew members at least learn to load, correct stoppages, shoot and shoot well.

These CCRC installations—which are under the command of Col. Harold D. Smith, with Lieut. Col. John P. Dwyer as director of training—are really "finishing schools for combat."

While, as broadly described here, many of the subjects covered make the CCRC program sound like a refresher course, this is not the case. There is a combination of basic and new information, plus a war atmosphere in the schools themselves which exacts from every man the utmost in ability and learning capacity and which leaves him, after only two weeks or so, far better equipped for combat than he could possibly be when he arrives.

Directors and instructors of the schools are all battle-trained themselves. Furthermore, they understand the art of education as well as their own particular subject; they constantly alter the syllabus of instruction to keep completely abreast of every new combat development. They know from experience the urgent need for a man to be absolutely "on the ball" before he crosses the Channel. ☆

AAF REDISTRIBUTION STATION

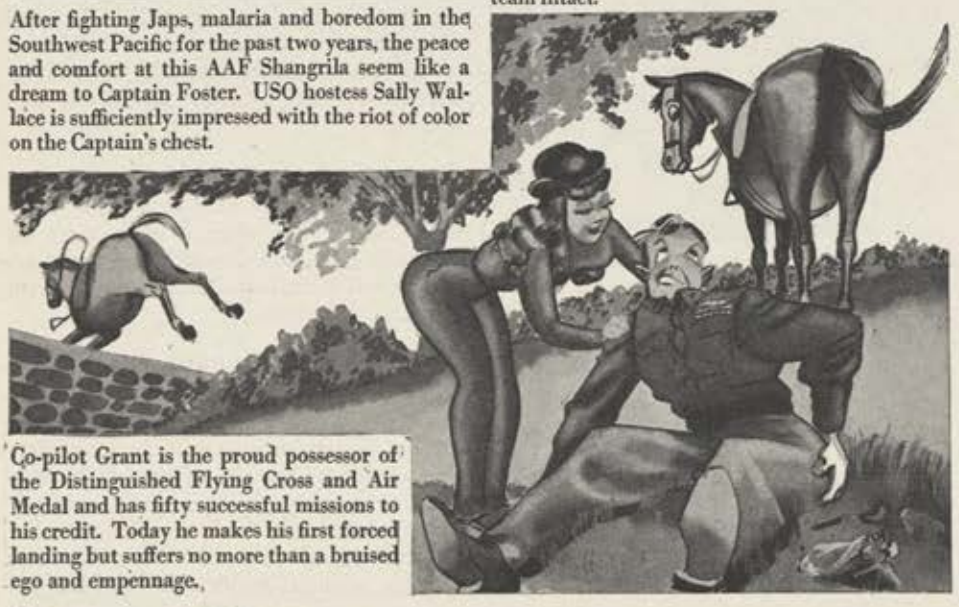
By Lieut. Wm. T. Lent

Each returnee's service record and all his GI memorabilia are given a rigid inspection at the Redistribution Station. As a result, in this instance, Master Sergeant O'Rourke has been enriched by six months' back pay on flying time. Overflowing with appreciation, he pops for the lads in the record section who helped to make it possible.

While soaking up the sun and southern sights, a couple of bomber pilots indulge in their favorite pastime—arguing the relative merits and superiority of the B-17 and B-24. Today's battle is temporarily interrupted by a fast-looking job, complete with war paint and trimmed fuselage.

After fighting Japs, malaria and boredom in the Southwest Pacific for the past two years, the peace and comfort at this AAF Shangrila seem like a dream to Captain Foster. USO hostess Sally Wallace is sufficiently impressed with the riot of color on the Captain's chest.

Old home week at the station. Liberator Pilot Winchester, who has been assigned to a new bomber group in the process of being formed, finds his former navigator detailed to the same outfit. The classification officer and the flight surgeon share their delight in keeping an efficient combat team intact.



Co-pilot Grant is the proud possessor of the Distinguished Flying Cross and Air Medal and has fifty successful missions to his credit. Today he makes his first forced landing but suffers no more than a bruised ego and empennage.

Solicitude at the station knows no bounds. While Mrs. Peters of the local "Sewing Moms" repairs the sergeant's sleeve, Miss Randolph of the Red Cross tempts him with a basket of home made tidbits. Poor old General Sherman would roll in his grave at such a sight.

FLYING SAFETY

Suggestions from the Office of Flying Safety, Headquarters, Army Air Forces, in the interest of accident reduction.

These items are for educational purposes and are not to be construed as directives.

Use That Harness

In recent accidents a number of flyers have received needless injuries through failure to comply with AAF Regulation 62-18, which requires that safety harnesses shall be used in all planes furnished with the equipment.

To help correct this situation, Air Inspectors of the Training Command currently are treating wearing of harness, as well as safety belts, as a special subject for inspection.

The only conceivable objection to wearing a harness is that it restricts movement when locked. However, once a plane is in flight, it is a simple matter to throw a lever at the base of the seat releasing the tension and providing a flyer all of the freedom he needs.

The harness, of course, should be locked during all take-offs and landings and aerobatics, as well as when a crash landing is imminent.

Additional information on this subject may be found in Pilots' Information File, 6-8-1, as revised 1 August 1943.

Pilots' Advisory Service

During their first full month of operations, the 23 Flight Control Centers, OFS, issued 1,834 flight advisory messages, warning pilots of dangers and furnishing alternate procedures when necessary.

When pilots maintain a listening watch of Communications Stations en route, they are in a position to receive any report of changed conditions. When they fail to do so, they are throwing away the facilities of a nation-wide organization in favor of trusting to luck. The reports which follow illustrate the two alternatives.

Two B-17s took off from Pueblo, Colo., at 0055 on a round robin flight (Contact Flight Rules). Within a short time, weather conditions at Pueblo grew worse. The Denver Flight Control Center attempted to convey this information to the planes by means of range stations in the path of the flight. No contact was made. The planes returned over Pueblo at around 0530, and one of them attempted to land with an 800-foot overcast and a ground fog. The bomber crashed and burned. The other plane, milling above the overcast, subsequently received FC advice that Colorado Springs was CFR and made a safe landing there.

A C-78 left the Army Air Field at Garden City, Kan., for the auxiliary field at Gage, Okla. (Contact Flight Rules).

When the flight plan was received by the Albuquerque Flight Control Center, weather reports there indicated a 400-foot overcast at Gage. The CAA range station at Gage was instructed to convey the information and ask the pilot's intentions. The pilot, who was listening on the range, received the message and, not desiring to fly in instrument weather, returned safely to Garden City.

Control Towers on Wheels

Use of portable control towers at a number of bases in the Training Command has proved a valuable aid in accident reduction.

Stationed at the approach of the runway, a portable tower is in an ideal spot to prevent traffic mixups and over-shooting and under-shooting by trainee pilots. The towers are constructed locally of non-critical materials. A typical tower is shown in the accompanying photograph.

Regional Safety Officers assigned to the Training Command are promoting the utilization of the portable units wherever the regular tower is too far away to maintain adequate control over student flyers.

Flight Engineers' School

Recognizing the importance of flight engineers in operation of heavy bombardment aircraft, a bombardment operational training wing in Texas has set up a school in one of its groups to teach emergency procedures to these crewmen. Results so far have been excellent.

A regional safety officer, who assisted in establishing the school, reported that the wing air inspector's office had examined recent graduates and found them 100 percent better equipped for their jobs than any group examined previously.

Under the guidance of experienced manufacturers' representatives, student engineers go through a ten-day period of lectures and work on mock-ups and airplanes. The course is climaxed by a thorough written examination and a proficiency check in the air, which students must pass before being assigned to flight duty.

Both wing and group training sections predict that accident rates will be lowered through continued use of the school.

Subjects covered include hydraulics, electricity, fuel system, generators and engines.

Precaution

As a result of a near-accident at MacDill Field, Fla., when a plane took off with the pitot tube covered, red flags were tied to all pitot tube covers to attract engineers' attention.

Added Oxygen Training

A heavy bombardment OTU at Palmdale, Calif., is making sure that its crews do not go into combat with an insufficient knowledge of the use of oxygen by conducting weekly drills in high altitude emergencies.

They include practice with walk-around bottles, artificial respiration, rapid appli-

cation and adjustment of masks, first aid and various changes of connections and stations in the airplane. Emergency instruction periods are usually conducted when weather is bad or planes are out of commission temporarily.

Weather 'Round Table'

The 2nd Air Force has instituted a program of "round table" discussions by weather forecasters within a wing area before each daily forecast as a means of increasing forecast accuracy. The plan was initiated by a heavy bomber wing with headquarters at Topeka, Kan. Heavy bombers of this wing take protracted flights to both the east and west coasts.

The discussions are held each midnight on the telephone system, with the wing and base weather officers plugged in. For forty-five minutes the pros and cons of the synoptic picture are analyzed.

"In this way we get the benefit of the experience of all," comments Capt. W. A. Brown, 2nd Air Force staff weather officer. "Some forecasters are strong on weather in the east, others have had their experience on the west coast. In any case, all forecasters get the benefit of the best experience available."

At the start of the conference, the wing weather officer arbitrarily singles out one base weather man to make the forecast, thus insuring that each man will be prepared nightly.

After the forecast is agreed on, the wing officer TWX's the finished product to the bases. If any base subsequently makes changes due to local conditions, the wing is notified.

"Since the program began last November," Capt. Brown states, "the wing hasn't lost a single plane due to weather."

Teeth in Regulations

Regulations and Enforcement Division, OFS, reports that severe punishment of offenders is reducing flagrant violations of flying regulations to a minimum. Here are a few recently reported cases:

While flying too low, a staff sergeant liaison pilot clipped a high tension wire. It fell to the ground and started a grass fire. Children playing nearby were attracted to the blaze and a ten-year-old boy stepped on the live wire and was electrocuted. The pilot was court-martialed and sentenced to be reduced to private, serve six months at hard labor and forfeit $33 pay per month for a like period.

An aviation cadet entered traffic from the wrong side of the field and landed cross-tee, causing another pilot taking off to slam on his brakes and nose over to avoid a collision. The cadet will pay more attention to regulations after carrying a sign inscribed "I Help The Axis" up and down the flying line for five days.

When a commissioned pilot buzzed a TVA installation, he struck a main transmission line, causing injury to himself, a $700 damage to the airplane and a three-hour slowdown at a nearby shell-loading plant. This pilot is restricted to the post for three months and is forfeiting $75 per month for six months. ☆

P. & I. SAYS:

(The Prevention and Investigation Division, OFS, is composed of veteran flyers. These reports include comments by these veterans on recent accidents. Read and heed.)

MERIDIAN, Miss. — Preparing to land after a cross country flight, the pilot of an A-24 discovered that he could not extend his landing gear. The lever was jammed in "up" position and could not be budged.

Advice from the tower failed to help. The pilot made a belly landing on the field with no injury to himself or his passenger, but considerable damage was done to the plane.

Subsequent investigation disclosed that a nut—foreign to the plane—was lodged in a position to foul the gear controls. It was hidden from sight and could not be found in the air.

The accident was blamed on improper maintenance, and an investigation was launched to prevent its recurrence.

P & I COMMENT: A loose part or tool in an airplane may sometimes mean the difference between life and death in the air. All ground crews must be cautioned repeatedly concerning the dangers of foreign objects fouling controls.

KEESLER FIELD, Miss. — A series of pilot errors recently resulted in injury to two crew members of a B-17F and a badly damaged airplane.

His first blunder came when the pilot landed on the wrong field. Cleared from Dalhart to Gulfport on a night training flight, the pilot landed at Keesler instead of Gulfport where runways were longer.

After an unusually short approach, the wheels touched 1,100 feet from the end of a runway 5,000 feet long. Instead of going around again, the pilot applied his brakes so suddenly that the plane smashed its nose and props into the ground and settled back to crush the tail wheel assembly.

P & I COMMENT: When in doubt, go around again!

PROVIDENCE, R. I. — A formation of three P-47s came in for a landing. The first plane landed and cleared the runway; the second was forced to groundloop because of brake failure, and the third nosed over to avoid crashing into the second plane.

The tower warned the third plane of the crash on the runway, but the warning came too late. All the pilot could do was apply brake to prevent a collision.

Accident investigating officers blamed the accident 100 percent on supervisory personnel in the tower.

P & I COMMENT: No matter how proficient a pilot is in landing his plane he cannot see through a blind spot. It is the responsibility of the tower to keep him informed of unexpected hazards in his path. That's one of the reasons why we have towers.

SELFRIDGE FIELD, Mich. — The pilot of a P-40F, following a P-47 out for take-off, crashed into another P-40 parked at the extreme edge of the strip. The parked P-40 was allowing the engine to cool before taking off.

Although the pilot of the offending P-40F said he was "essing" and taxiing slowly, the other pilot testified that the plane came toward him in a straight line for more than 100 feet. Results of the crash indicated that the P-40F was taxiing too fast.

P & I COMMENT: A taxi strip isn't a good place to park an airplane, nor is it good practice to taxi blindly behind another ship. Sheer carelessness almost without exception is responsible for this type of accident.

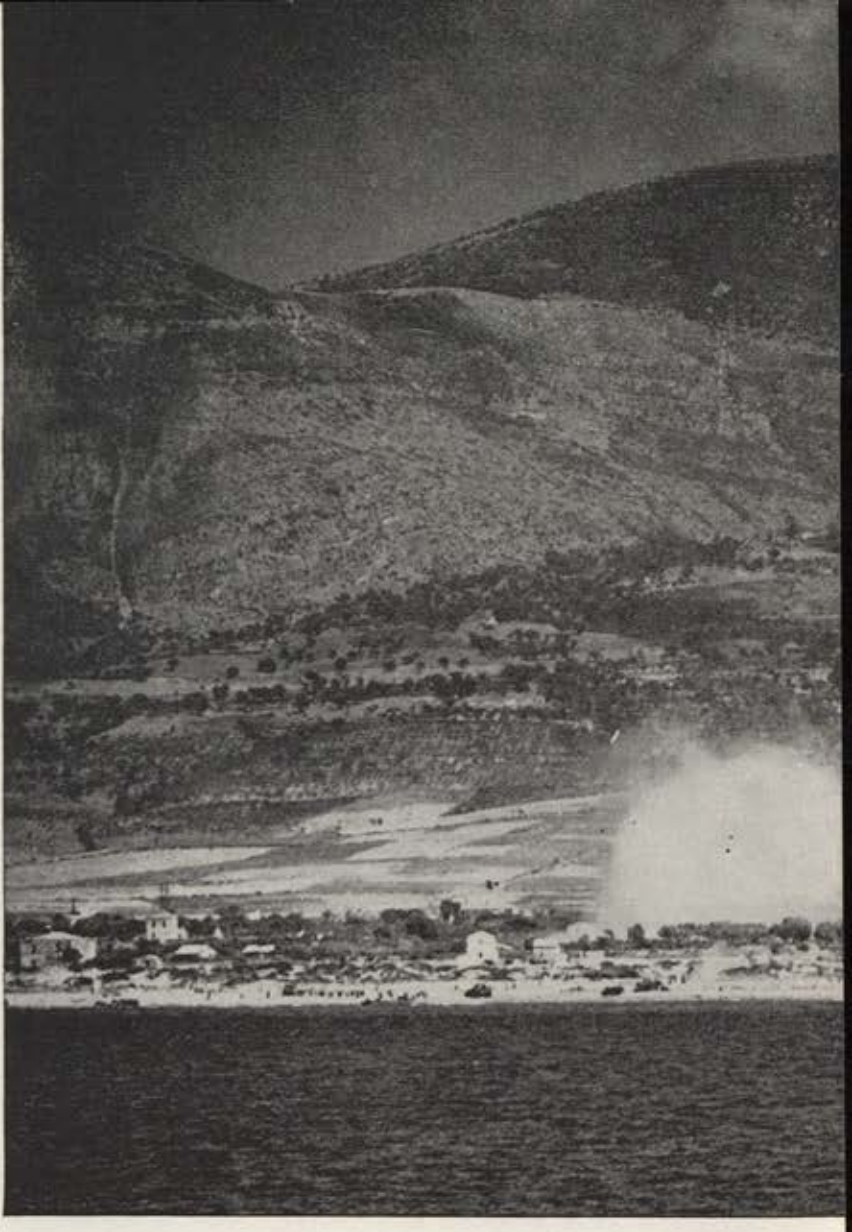
MATHER FIELD, Calif. — A BT-13 landing on a field where construction work was in progress rolled through an area clearly marked with yellow flags and wound up in a ditch, tearing off the landing gear.

P & I COMMENT: While making his approach this pilot should have made a mental note of the point of landing, then scrutinized the area through which his plane would roll. These surveys must be made while a plane is still in the air, because once on the ground the nose of the ship will interfere with vision. ☆

Salerno:

INVASION PROVING GROUND FOR AIR POWER

By Herbert H. Ringold
AIR FORCE Staff



When the AAF saved the day at Salerno, it demonstrated air power's capabilities for coming invasion of Western Europe.

THE Battle of Salerno provides the best example of what air power is capable of accomplishing in the invasion of Western Europe.

In that engagement air power not only redemonstrated its necessity to large scale amphibious operations, but also its extreme flexibility—its capacity to change suddenly the entire nature of its operations yet retain its maximum striking power.

Air power in the original battle plan was committed to diversified operations ranging from local cover to long-range strategic bombing. However, when strong opposition prevented invading troops from proceeding according to plan, air power was able to mass all its available strength in direct support of the ground forces and turn impending defeat into assured victory.

At the outset, Allied strategy called for landing thousands of troops at Salerno to split the German forces, speed the conquest of Italy and secure airfields closer to the enemy's heart for continued attacks upon strategic targets. The initial landing objective was to establish a beachhead 25 miles wide and 12 miles deep in the Salerno area and make contact with the British 8th Army moving up from the south.

The Army Air Forces originally had three major assignments:

(1) Fighter planes were to throw a protective screen over naval vessels and the troops landed on the beaches.

(2) Medium bombers were to pound communication lines, hit airfields and create roadblocks to prevent enemy reinforcements from reaching the beachhead.

(3) Heavy bombers were to perform their normal function as part of the strategic Air Force and hit military installations outside the invasion area.

Supporting these operations, A-20s were to drop flares and incendiaries for night-flying B-25s and Wellingtons; Beaufighters of the RAF were given night patrol assignments; P-51s were to perform tactical reconnaissance, and C-47s and C-53s of the Troop Carrier Command were to drop paratroops, transport Airborne Infantry, deliver emergency supplies and evacuate wounded.

However, the enemy, forewarned by aerial reconnaissance of the apparent destination of our convoys, met our invasion forces with sufficient strength to jeopardize the entire operation. Continued resistance forced changes in original air assignments and placed responsibilities of the most vital importance upon the AAF.

The flexibility of an air force properly created and efficiently led met an extreme test, and practically every type of aircraft was able immediately to take on an additional function. The tactical and strategic air forces, designed to perform separate functions, were effectively combined in the midst of the battle to meet an unanticipated crisis.

B-17s, B-24s, B-25s and B-26s were

This is how a portion of the shoreline at Salerno looked to invasion troops moving in for landings. A shell is shown bursting in the background. Huge, rolling hills rise to a height of 2,000 feet like a backdrop to the narrow coastal plain. Allied planes flew steady cover during landing operations.

pulled in to bomb troop concentrations and tank elements which were holding up the Allied advance; A-36s, originally assigned to fly low cover, were used to dive-bomb artillery emplacements; P-38s and P-40s, low to medium cover in the planned aerial umbrella, were ordered to make low-level attacks on enemy troops and transportation facilities. Other P-38s, which were used in earlier campaigns for skip-bombing by the Strategic Air Force, were transferred to tactical operations and given dive-bombing and strafing missions.

All fighters were based on Sicily, approximately 200 miles from the beachhead. The AAF had not anticipated running long fighter missions for more than two days. Enemy resistance, however, prevented capture of airfields in the beachhead area as originally planned, and fighter pilots were put under the additional strain of spending almost two hours flying to and from the target area. Fortunately, insofar as equipment was concerned, the AAF had over-insured against such a contingency and had a greater than normal extra supply of belly tanks on hand, enabling the fighters to continue these operations for six days.

It is difficult to determine when the air battle of Salerno actually started. The beachhead was assaulted by ground troops on September 9, but weeks before heavy and medium bombers had softened up the enemy for the attack. They ruined airfields, pinned aircraft on the ground and weakened the striking power of the Luftwaffe by shattering the fighter formations which rose to meet them. Supply centers and communication lines around and far above the invasion area were hammered repeatedly.

When the ground battle began, cooperation between the ground troops and the AAF was so precise that dive-bombing requests from the Infantry were actually passed on to the attacking planes while they were in the air on their way to, or immediately over, the invasion area. Fighter-bombers and dive-bombers hit enemy positions within from ten to thirty minutes after the ground troops had relayed the location of the targets. The overall aerial operation was coordinated perfectly by headquarters personnel who had a sortie-by-sortie report of all developments and were in a position to dispatch aircraft whenever and wherever support was needed by the ground forces.

From the outset the Allies maintained overwhelming control of the air. All told, fourteen different types of Allied aircraft participated. More than 2,000 sorties were flown in a single day, yet our aircraft losses were so low that some groups did not suffer a casualty. The small number of German planes which did get into the air during the day were, with few exceptions, either shot down or prevented from reaching the battle area.

Moreover, the extent to which the continued presence of Allied aircraft over the

Weeks before ground troops assailed the beachhead on September 9, AAF bombers had struck repeatedly at the Salerno port area, softening up the enemy for attack. On this particular mission B-26s of the 12th Air Force, covered by P-51s, scored hits on railroad tracks, buildings and shore installations. The Germans sent up ME-109 interceptors and thirty were knocked down.

battle zone raised the morale of the ground forces cannot be over-estimated.

Precision bombing continued throughout the operations as heavy, medium and dive-bombers hit enemy troop concentrations in front of the Allied ground forces, blasting a path through which the Infantry could press its attack. Lieut. Gen. Carl A. Spaatz, then commanding general of the Allied Air Forces in the Mediterranean theatre, observed:

"Never before have bombs been employed on a battlefield with such telling effect."

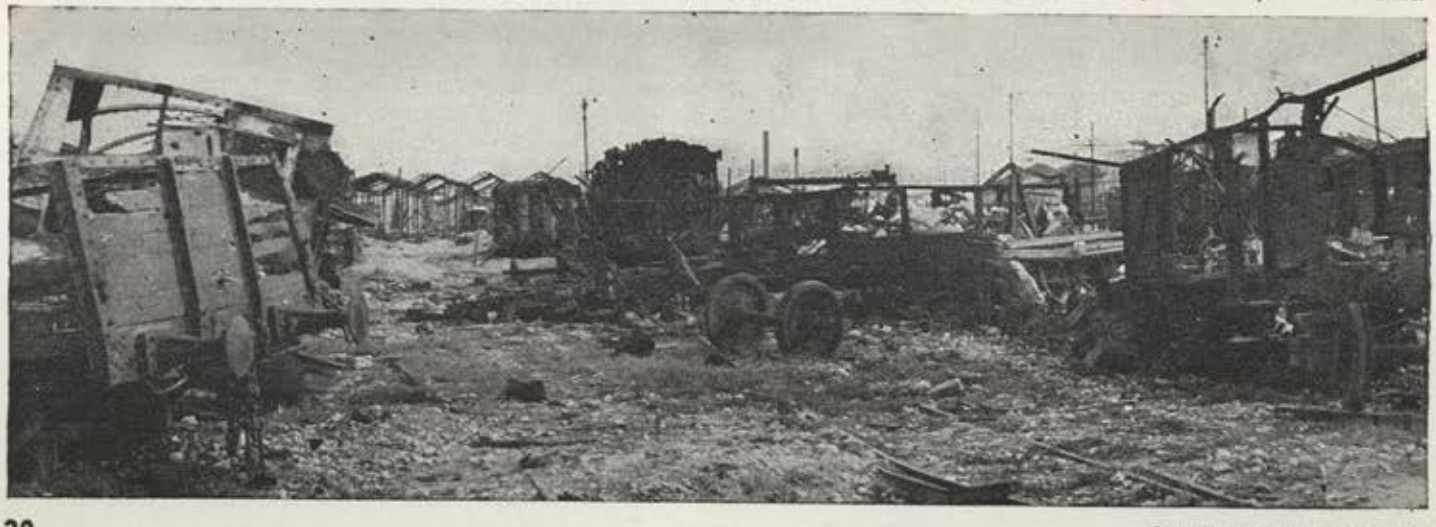
First news of the impending invasion came to the lower echelon of AAF personnel on September 6, 72 hours before D-day, when General Spaatz called a meeting of group commanders. In a two-hour session, Air Marshal Sir Arthur Coningham of the RAF announced the forthcoming operation and described the exact nature of the aerial support it would require. He outlined the entire method of attack, pointing out in minute detail the job of the ground forces, the part of the combined navies and the function of the supporting air force.

Then Col. W. S. Gravely, chief of staff of the 12th Air Support Command, broke down the assignments with regard to fighter and fighter-bombers. The attack was explained in the form of a timetable and each group commander was told how many of his airplanes would be required, their assigned altitudes, their patrol period and the particular stretch of the beachhead for which they would be held responsible. Lieut. Col. Frank A. Hill, commanding officer of a Spitfire group, commented later, "We didn't deviate from that schedule by more than thirty seconds. It was absolutely perfect."

For from two to four days before the invasion, the convoys en route to the assault area were protected by an aerial screen provided by Coastal Command aircraft. At 0605 on September 9, the beachhead air cover schedule went into effect. Four different types of aircraft made up the first aerial umbrella. A-36s and British carrier-based Seafires covered from 6,000 to 10,000 feet, P-38s from 10,000 to 14,000 feet, and Seafires and Spitfires from 15,000 to 22,000 feet. The A-36s operated with squadrons of eight planes, the Seafires used from six to eight, the Lightnings twelve, and the Spitfires patrolled in two groups of six planes each, with the first element at 15,000 feet and the second from 20,000 to 22,000 feet. Each squadron was given a fifteen-to-twenty mile beach area to cover, and reinforcements were arranged so there was always a relief group of planes on the way to the target.

This is how Lieut. William Murphy, P-38 pilot, describes the first mission of his group: "We left after dawn and picked up warships, transports and landing craft just off Salerno. I could see the activity beneath us and it appeared that

Africa-based B-24s visited Foggia in persistent waves for three consecutive days, fighting off Focke Wulf 190s and reducing the airdromes and railway marshalling yards to rubble. The debris pictured here gives a good idea of the thoroughness of the job done by the Liberators.



there wasn't much in the way of opposition. We assumed our position over the beachhead in groups of four in stepped-down strings. Throughout the first day, we didn't have any aerial opposition. We just went up and back, up and back, without any trouble. There were control boats in the water to warn us of approaching planes, but during the first day there just wasn't anything to warn us about."

THE same was true for the top cover Spitfires—no German aerial activity—according to Capt. Dale E. Shafer. "I was over the invasion area with the first element," he recalls, "and it was just like a practice mission. All we did was fly around for awhile and then go back to our base while another group took over. Our squadron flew in elements of two, line abreast, and the whole operation was damned monotonous the first day."

The original German tactics consisted principally of single planes trying to sneak through to bomb the boats in the harbor. Lieut. Malcolm Hormatz, Spitfire pilot, relates, "One or two Nazis would come in from the seaward side at about 20,000 feet, mostly FW-190 fighter-bombers. They would dive toward land and drop their bombs on the convoys from 8,000 to 13,000 feet. Then they would keep on diving, hit the beach, strafe the ground and continue back to their lines. But not many of them got through our screen."

Colonel Hill explains that one of the principal reasons for the success of the protecting aerial screen was the fighter control system.

"That control system was marvelous," adds Captain Shafer. "I remember once when they called me and said, 'Fighters approaching you, now a mile away,' and gave me the direction. They then called back and reported, 'Fighters now half a mile away.' A moment later they called and said, 'Heads up, here they are.' I looked in the designated position and sure enough there were the Germans."

The ground control station, established on the beachhead, was used not only to warn against approaching enemy aircraft, but also to provide liaison between the ground troops and the air forces in the selection of enemy targets. Direct contact was maintained between the Infantry and the control station. When advanced ground forces needed supporting aircraft to wipe out strong enemy emplacements, messages were relayed to the control station and immediately radioed to air elements. The control station operator described the exact nature of the target, its location and importance, and actually briefed the pilots while they were in the air heading toward the battle ground. This was a makeshift arrangement due to the difficulty in getting target information back to Sicilian bases in sufficient time. After the fighter units became operational in the Salerno area, all pilots received complete briefings prior to their take-offs.

These paratroopers were eager for news. The pilot of this P-40, returning from a mission, had no sooner stepped from his plane than he was surrounded by jumpers who were anxious to learn details of the invasion, how the ground forces were progressing along the newly won beachhead.

Fighter-bomber pilots, about to leave their bases without specific briefing, would ask incoming pilots how to select their targets. They were told, "Oh, some major at a fighter control center will pick you up and give you a perfect briefing just before you reach the target."

THAT major was Jack Romerman, assistant chief of staff for a section of a fighter wing, whose control station was set up in an unprotected farm building within direct range of small arms fire and under constant shelling of heavy German artillery. He was commended later, in the name of General Eisenhower, for gallantry in action.

At one point, a battery of German 88 mm guns, thought to be located in a tobacco factory on the northwest side of the Salerno plain, was subjecting Allied ground forces to murderous point-blank fire. Apprehension was felt about calling for supporting aircraft because the enemy position was so close to our own troops. However, the situation became critical and instructions to dive-bomb were forwarded to the control station. Major Romerman described the target by radio to a flight of A-36s. They peeled off and dropped their bombs squarely on the emplacements, wiping out the battery and enabling Allied troops to continue their advance.

Meanwhile, P-51s were handling the tactical reconnaissance work. "We had two main jobs," reports Capt. James J. Armstrong. "There were about twenty of our planes operating, with half of us doing naval adjustment fire and the other half assigned to road reconnaissance for the ground forces.

"My assignment was to help with naval adjustment fire. We flew in two-ship elements at 4,000 feet, watching the bursts of naval artillery and informing the ships of its accuracy. Our job is probably the most soul satisfying in the entire air forces. I remember that first day when the Navy told us about a particular enemy artillery emplacement they were firing on. We went over to check the fire and observed that it was slightly short. I called the ship that was laying down the barrage and indicated the necessary adjustment. A couple of minutes later six gun salvos landed squarely on the target. We were both working from gridded maps, and those naval guns could hit a dime at 32,000 yards and give you nine cents change.

"Once our troops were only 500 yards away from an enemy emplacement when the Navy opened fire after having received the precise location from our observation. The target just disappeared.

"Usually the combined navies selected their own targets from information received from the ground forces. It was our job to pick out additional targets, give the information to the control station and let them decide how the enemy installations could best be attacked.

"We ran into no enemy aerial opposition. In our two ship elements, one plane did the observing while the other ship watched for intruder aircraft. Our normal cruising speed was 250 miles an hour. From 4,000 feet at that speed you can see with surprising accuracy. Whenever we wanted to look at something on the ground, we would bank up, criss-cross in sharp turns, or stand the plane on one wing and take a quick glance.

"On the second day I did reconnaissance in cooperation with the ground forces. I observed a great many enemy troop movements on a road leading into the beachhead. Information of that nature was important enough to warrant the immediate attention of the ground forces, so I moved in for a landing on the Paestrum landing strip, just south of Salerno. This strip had only recently been constructed by our aviation engineers, and it was frequently under direct enemy fire. My observations were sent to the control station and a few minutes later, dive bombers went out to attack the troop movement. You can't ask for closer cooperation than that."

The planes called in for the attack were A-36s operating from Sicilian bases. Lieut. Harold Hill described the operations of his outfit in this manner: "On the first day, we were low cover in the protective screen, patrolling at about 6,000 feet. The beachhead area was divided into three sections, with our element covering the area from Salerno to the Isle of Capri. We flew in eight-plane flights, line abreast, but we split up so that we could give each other protection.

"On the first two days, there was no enemy opposition at all. However, on the third day, we saw an FW-190 and an ME-109 at about 7,000 feet. They evidently didn't see us, for they started to drop right in front of us. At that time I was flying Lieut. Bob Hood's wing man and we went after the ME. We chased him down to the tree tops and I started shooting from my position slightly in back and to the right of Hood. When I opened, the German turned hard left, directly in front of Hood. Bob just raked him up and down until he caught fire and crashed. At the same time, Lieutenant Campagna got the FW. Those were the only two German planes we saw during our patrolling activities.

"The next day we were ordered to dive-bomb roads and bridges directly beyond the Salerno area. Apparently at that time the situation on the ground was still under control because our job was to cut off the routes of the retreating Germans.

"Our first indication that things were going badly came the next day. We were sent out on a dive-bombing mission with instructions to land on a strip just south of Salerno, if the Allies held the area. When we got over it, we found it was in our possession so we landed. We soon discovered that we were no more than two miles from the enemy emplacements. As a matter of fact, two of the boys in our flight picked up some holes in their ships from German field pieces when they got into the traffic pattern to land.

"That was one hell of a place. The Navy was shooting just over our heads all day, the answering fire from the Germans just missed us, and Nazi planes came roaring directly past the field as they went in after the boats.

"We ran a strafing mission under rather unusual circumstances. We were too close to the enemy for a regular take-off, so we got out by spiralling straight up until we were around 6,000 feet. We took off in two-ship elements, climbed straight up and then made a wide turn while we waited for the formation to gather. Then we just nosed the planes right over and went into our dives.

"We sprayed the troops beneath us, hit the deck, made another turn and came back to the field in two-ship elements. The entire operation took only twenty minutes. When we returned, we were told that an enemy counter-attack was feared, so we were ordered back to Sicily. We left that night.

"Two days later, we returned. This time conditions were better—the enemy was now five miles away. We started running pin-point dive-bombing jobs in direct support of the ground forces. Whenever something held them up, we were called in to wipe it out.

"That tobacco factory on the edge of the Salerno plain really took a lacing. All we were told was the general target area

Establishment of airfields was of first importance. Just one mile from the beach aviation engineers selected two adjoining farms for conversion into an emergency landing field. Trees were bulldozed and a fast job with pick axes helped level off the new runway. First to use the field were two P-38s which came in exactly 24 hours after the cotton and wheat fields were taken over by aviation engineers. The task of engineers in advancing our airbases closer to the enemy and his supplies is vital in maintaining control of the battle sky.

In carrying out its bombing mission at Salerno this B-25 was hit by enemy fire and had to make a landing on one wheel. The field was still under construction, but the pilot managed to balance the plane on one wheel, turn into his port wing and whirl to a stop. No one was injured.

and the fact that it was a big yellow building. Twelve of us went after it. We started our dive from 10,000 feet, dropped our bombs and then continued down to 1,000 to strafe. That was the end of the tobacco factory, the troops in it and the whole hub of the German spearhead which had stopped our ground forces.

"The day after we hit the tobacco factory, we went after another strong German emplacement which was so close to our field that my crew chief climbed on a building and watched us hit the target. This time it was German guns on a hill at the northeast section of the town. Our only information was that the enemy was established in a big green field. We found the field, but they had it so well camouflaged we couldn't see any individual emplacements. But we sprayed the entire area, back and forth, and a short time later our ground troops didn't have any trouble taking it, so I guess we did our job."

THE experience of Lieut. Robert C. Congden, P-38 pilot, indicates the desperate nature of the land battle and also describes further the precise state of cooperation between the air and ground forces. "We were in the protective screen for a short time when we were told to jettison our bombs and go after some MEs," Lieutenant Congden recalls. "We chased them, but they beat it. By this time, we were very low on gas and I told the control station about our predicament. 'Stop worrying,' I was told, 'we got a landing strip for you to come down on.'

"Well, I looked down and there were some scrapers making a landing strip in a wheat field. When we got down to about fifteen gallons, we buzzed the field so that they would get out of the way. Then we landed. Had the enemy been able to break through that protective umbrella, they could have spotted us easily and shot up all of our ships. As it was, we lay in the mud while all sorts of shells exploded nearby and tanks battled only a mile and a half away."

Construction of landing strips began on D plus one by two engineering organizations—the British Tenth Corps airfield construction group working in the northern sector and the U. S. Aviation Engineers in the southern sector.

The situation on the ground, meanwhile, was not well in hand. On September 11, the enemy counterattacked in force and drove the Americans out of the key town of Battipaglia. They pushed south of the Sele River and captured important ground between the Sele and Calore Rivers. The next day, the Germans brought up reinforcements, renewed their attacks and made additional gains. The official communique reported that "the Germans are counterattacking desperately and at certain points have regained some of the ground previously taken by us." The enemy continued his attacks and, on the 15th, the communique stated, "In some places, our troops have been forced to give ground."

German aerial tactics changed with their rising fortune on the ground, and they started sending in large formations of bombers, covered by fighters, in a desperate effort to wipe out our beachhead.

Lieut. Walter Scholl, P-40 pilot, recalls this action. "We were headed north along the beachhead when I saw ten JU-88s at about 5,000 feet with twelve ME-109s escorting at 12,000. The twelve of us dropped our belly tanks and went after the bombers. When we went down on the JUs, the MEs came down on us. Our flights separated with some squadrons going after the bombers and others pulling around to fight the MEs. We kept our formation of four planes each and fought off their fighters, getting four confirmed. Other flights of P-40s came over to help, preventing the Nazis from getting through."

B-25s were called in to prevent German panzer divisions from reinforcing their ground troops. Capt. John Robbins, Mitchell pilot, reports, "Our job was to cut off the 16th Armored Division by creating roadblocks. Thirty-six of us went

German troops harassed by A-36s and P-38s were further pressed by the determined blasting that Allied bombers gave the Italian highways along which supplies were fed to the Germans.

A P-40 takes off behind the wreckage of a German Mark IV tank which was destroyed a few days before. Shown at the left is an anti-aircraft crew on the watch for the attack of enemy planes. Three aircraft are parked along the runway which was cut out of Italian farmland.

out at night in three squadrons of twelve planes each. We took off singly at thirty-second to one-minute intervals and attacked the target individually.

"Even though there was a moon, our target was not lit up very well because it was in a valley. But the A-20s, piloted by South Africans, took care of that. Those boys were perfect. Only about six of them operated with each group, but they were always right on time and right on the target. We were given their estimated time of arrival and I approached the target just as their ETA was up without seeing any flares. A bit worried, I made a 360-degree turn to await developments. When I looked again, the whole place was blazing with flares and incendiaries. They were right on the ball. The flares were dropped from 600 feet and all we had to do was bomb on top of the flares. It was practically automatic.

"After that, we went into daylight work. We were given pin-points and grid coordinates and we bombed from 10,000 feet. Our work was so close to our own lines that the ground forces used various chemical devices to indicate their position. That was what you call precision bombing of the highest order."

The B-26s, based in Africa, were ordered into the battle and also assigned to hit road junctions to prevent panzer divisions from approaching the beachhead.

"The target was seven miles southeast of Salerno," relates Capt. John E. McClure, "and we staggered our sorties so that there were Marauders over the area practically all the time. We kept hitting and hitting those road junctions until we got tired of seeing the same bomb craters.

"Thirty-six planes went out every time, flying in four squadrons. We bombed from 10,000 feet. A different road was assigned to the various squadrons, and we had a monotonous time beating hell out of our particular road.

"We never saw any enemy aircraft. There were some dual purpose guns firing at us from the ground, but they didn't cause us any trouble."

Lieut. Bertsyl Faris adds, "My squadron of B-26s made a great mistake one day. We were assigned to a road and we missed our target completely. It was a crying shame. Quite by accident, we hit an enemy ammunition dump and I think Hitler's mustache waved in the resulting breeze. I was up at 11,000 feet and my plane rocked. Enough errors like that would win us the war."

The B-24s were in action from the beginning of the invasion, although they were not directly over the target area. Their original job was to bomb Foggia to keep the German air force from getting off the ground. The fact that personnel from all the groups reported very little enemy aerial activity is a tribute to the efficiency of the Liberators.

"Sixty B-24s attacked Foggia on the day of the invasion," according to Lieut. Carl F. Root. "We were stacked down in Vs in trail and we bombed from 18,000 to 22,000 feet. Our bases were in Africa so it was a 9½-hour mission, but we were over Foggia for three straight days. On the first day we were attacked by fifteen FW-190s but there were no casualties. On the second and third days the opposition got tougher but we kept going in. We messed up Foggia so badly that the Germans stopped using the airdromes. I understand that they didn't get a plane out of there after the third attack.

"After Foggia, we switched our attention to Pescara, a port and railroad link on the east coast. We also went after Potenza, another rail marshalling yard. If the Nazis pushed their supplies past Pescara, we got them at Potenza. They just didn't stand a chance. That was their only supply route into Salerno and we blasted hell out of it. There was no aerial opposition at either town and very little flak. We had a picnic."

The job of the African-based B-17s was similar to that of the B-24s—bombing supply centers and road intersections back of the German lines.

"We really made saturation raids," recalls Lieut. Col. Albert Orance, commanding officer of a B-17 squadron. "On our first mission, there were 48 planes from our group, in addition to four other groups, all at full strength. Each ship had twelve 500-pound bombs and we dropped them from as low as 15,000 feet. Usually we ran only one mission a day, but on the fourth day we ran off two."

"I was on both of those missions that day," adds Lieut. Charles F. Downey, "and I can say it was the roughest day I ever spent in my life. Each mission took about six and a half hours, with only two hours' rest between operations. We got up at 0400 hours, took off at 0630 and returned about 1300. Then we had a quick lunch and a short rest before we were briefed for the next mission.

"Actually, I think that day was rougher on our mechs than it was on us. They had to get our ships ready in a hell of a hurry. In fact, fifteen minutes before take-off time, they were still gassing my ship and all the bombs were on the ground underneath it. I got off on time, however.

"The first mission that day was an all-out effort—everything we had went into it. We were after enemy troop concentrations which were uncomfortably close to our own lines. When we returned, we were told that our forces were in danger of being pushed right off the beachhead, so every man who could fly a plane was anxious to go right out again. My ship was ready to fall apart on that second mission, but we got over the target. Each plane dropped twenty-four 100-pounders from 15,000 feet."

Colonel Orance states that there was very little enemy aircraft activity and no flak encountered on most of the B-17 raids. "Apparently the Nazis had leveled out their ack-ack guns to fire on the beachhead. As far as we were concerned, the battle of Salerno was just another attack. Previously, we had bombed from 23,000 feet but our new orders called for 15,000 feet. That made us a little apprehensive at first, until the boys were told the importance of the mission. I was particularly impressed with the fact that we were told the reason why we were being brought down to 15,000 feet. We were informed that the ground forces were in danger of losing their beachhead, and that was enough incentive for us. Actually we didn't have any trouble. There were no planes lost in my group through the entire Salerno engagement."

Action carried out by the Troop Carrier Command also contributed to the overall success of the AAF. About noon on September 13, General Clark sent a special courier by air to headquarters of the 12th Troop Carrier Command in Sicily. He requested the TTC to drop strong airborne reinforcements behind our own lines to protect an exposed flank.

Captain Armstrong of the tactical reconnaissance group offered an interesting sidelight concerning this message. "It was one of our men—Lieut. J. R. Hamilton—who delivered that request. He made a routine landing at the Paestrum air strip just when General Clark wanted the note delivered. Hamilton took off immediately and went to Sicily in search of the commanding general of the Troop Carrier Command. When he arrived, he found that the general had just taken off on another mission. Hamilton rushed into the control tower and demanded that the general's plane be called back. That was quite a thing—a second lieutenant calling down a general's plane—but it returned and Hamilton delivered his message."

Brig. Gen. P. L. Williams, CG of the Troop Carrier Command, promptly dispatched two members of his staff, who were accompanied by General Gavin of the airborne forces, in a C-47 to coordinate the request with General Eisenhower and General Spaatz.

LIEUT. COL. DAVID LAUX, one of the staff officers, relates, "We landed at the headquarters of General Spaatz where I talked to the assistant chief of staff, A-3." He called General Spaatz and Air Marshal Sir Arthur Tedder and received immediate approval. Meanwhile, the C-47 with the other officers had continued to the headquarters of the Army Group where overall approval was obtained and instructions dispatched to all units, coordinating the proposed mission. Within three hours after General Clark's message was received, he was informed that all coordination had been effected and that the mission would be run that night, as requested."

Shortly after dusk, three pathfinders with fifty paratroops took off from Sicily and set up directional beacons for the mission. Eighty-seven C-47s followed within three hours, carrying 750 paratroops and their equipment. No aircraft were lost.

On the following night another mission was conducted by the TCC. Approximately 1,400 Airborne Troops were ferried to the Paestrum air strip. Again, the operation was conducted without any aircraft loss.

In addition to bringing in paratroops and airborne infantry, the TCC also evacuated the wounded. From September 11 until September 24, 1,503 patients were removed in TCC planes.

Much needed supplies also were delivered by the TCC. On September 16, thirty C-47s landed in the Salerno area, bringing equipment to the troops in the Sele River sector. On the following day, forty-four planes brought in ammunition for the forces they had previously ferried to the area. On the 18th, fifty aircraft carried strong reserve personnel for the original airborne divisions. Daily movements continued thereafter.

The concentrated pounding from the air was not long in taking effect, and on September 16 the ground troops were able to counterattack in force, retaking important enemy positions.

By the next day, the tide of the battle had definitely turned. General Clark in his order of the day, said, "We have arrived at our initial objective — our beachhead is secure. Additional troops are being landed every day and we are here to stay. Not one foot of ground will be given up."

By September 17, the Allied ground wedge had been driven to the depth of eleven miles and on the following day, the enemy began to withdraw. The battle had been won.

Summing up the activities of the AAF in the battle of Salerno, General H. H. Arnold commented:

"There was no resisting an effort of that magnitude. The Army Air Forces did more than save the day at Salerno. The breach it helped to make on the European fortress can never again be sealed." ☆

Shot down in the previous day's fighting this P-40 is silhouetted against the early morning sky as infantrymen advance to beach positions.

PREPARE FOR INSPECTION

TIMELY ADVICE FROM THE AIR INSPECTOR

Administrative Communication ☆ Technical Tactical

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

▸ *On Your Toes:* Have air crews been trained to keep their eyes open on missions into enemy territory?

Tactical inspectors consider this a highly important question to be answered in the affirmative. It is good "life insurance" to keep looking around when coming home from a mission—or at any other time when enemy aircraft might be lurking in the vicinity. Crews must "cover" each other continuously.

Capt. Richard I. Bong, fighter pilot formerly in the Southwest Pacific, has this to say on the subject of looking around:

"One time I turned around to argue with a Jap who had been on my tail. But instead of one clown, there were nine after me now. I hadn't been looking around. But, as I had committed myself, I had to fly right through them. I set two on fire and left a third smoking. But they shot me up plenty. They knocked out the cooling fluid in the left engine and put some bullets in the other engine, the wings and the tail. Luckily, by firewalling everything, I made it home. After that experience, I always looked around."

▸ *Parachute 'Commandments':* Here are some "commandments" pertaining to parachutes and their use:

(1) A parachute will be assigned and satisfactorily fitted for each person making airplane flights.

(2) A parachute will be conveniently located to the *normal* position of the occupant to whom it is assigned or a position known to the individual.

(3) Occupants in aircraft will be familiar with the operation of parachute equipment.

(4) Occupants will have knowledge of the operation of emergency exits and their location.

(5) Occupants will be assigned a particular exit for use in case of emergency.

(6) Occupants will be familiar with emergency signal and "abandon ship" procedures.

Reports reaching AAF Headquarters indicate that these commandments are not being "obeyed" completely. The penalty for disobedience may be quick and severe. (AAF Memo. 121-32, 13 December 1943, a Special Instruction for Air Inspectors.)

▸ *Orientation with 'Sergeant Quiz':* "Why are we fighting?" is a $64 question in the Army, and the Aircraft Warning Unit Training Center at Drew Field, Tampa, Fla., has adopted the quiz program idea as one method of answering it. The Air Inspector is passing along the suggestion on orientation for the benefit of other commands.

The Drew Field weekly quiz program is conducted by Sgt. Fred Friendly (that's his real name), who comes from Providence, R. I., where his radio program was featured on the New England Yankee network.

A Tampa newspaper reporter describes the sergeant's show as an H. V. Kaltenborn news commentary, a March of Time radio program and a Ralph Edwards "Truth and Consequences" all rolled into one. Cartons of cigarettes go to the members of the winning teams, and a door prize is given for the nearest correct answer to a question.

The program has both personality and originality. Sergeant Friendly, who is all that his name implies, stays awake nights thinking up new stunts.

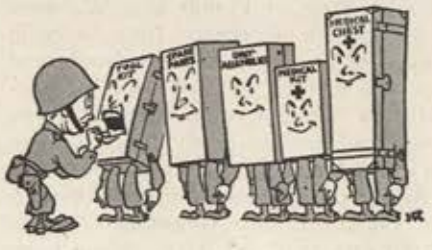
One of his latest is designed to help the men distinguish between enemy and allied nations. Friendly reads off a list of countries, and the contestant is supposed to murmur "God Bless America" for the Allies, and kick a sawdust image of Hitler in the rear for the enemies.

For another stunt question, the versatile sergeant assumes the role of a Nazi intelligence officer, and the contestant becomes a prisoner of war. In answer to any questions other than those concerning his name, rank and serial number, the contestant is supposed to thumb his nose.

Feminine interest is added, too. Girls dressed in sarongs, or wearing veils or some other distinctive item of clothing, walk out on the stage. As each one appears, the contestant is asked to name the theatre of war she represents and its commanding general.

"There's been a lot of talk about the American soldier not knowing what he's fighting for," comments the sergeant, "but not one contestant has failed to identify the Four Freedoms."

The training center has other orientation mediums. Included are a reporter's weekly review of the news, combined with an interpretation of the war's background and presented for one hour to every enlisted man and officer, and a "rumor clinic," where men may call to have rumors confirmed or killed by the substitution of facts. The "Sergeant Quiz" program, however, rates No. 1 in popularity and does an outstanding job of orientation.



▸ *Tool Chests and Medical Kits:* Have you ever had a flat tire while driving in the country and found you had left the jack in the garage at home? That is not half as bad as finding yourself minus a part or tool for a major item of equipment in combat. Spare parts, unit assemblies and tool kits should be checked constantly. Failure to do so has caused many items of equipment, from machine guns to airplanes, to become "casualties" in action.

A medical officer making inspections in the Central Pacific area also reported that many medical kits and chests were arriving overseas incomplete. The diary of a fighter pilot who had to ditch his plane in the Pacific tells of the difficulty he had in caring for his wounds because his kit was lacking just one item—adhesive tape.

▸ *Tail Turret Safety:* Tail turrets on bombers, like folding deck chairs on boats, won't give any man trouble if he knows how to handle them. But if he doesn't, he may get himself all tangled up. Whereas folding chair difficulties may

be exasperating, trouble in the tail turret may be fatal.

Adequate safety devices have been installed in tail turrets, and a properly instructed crew member is perfectly safe when he is in or around the turret. He knows, particularly, that he must not get careless and accidentally set the turret in operation.

Inspection of tail turret training should be on the check lists of tactical inspectors.

▸ *Headset Hazard:* Attention, pilots: If your headsets and throat microphones are permanently fastened to your plane, you are flying with a serious hazard in the event of an emergency. Not only is the practice dangerous but the disconnector units, if taped, may corrode and result in unreliable communications service.

TO 08-5-2 directs that "disconnector units will be used in the cord of each radio headset and throat microphone, and no modification of these units which would interfere with their functions will be made."

Checking on compliance with this directive was made a "Special Instruction for Air Inspectors" in AAF Ltr. 121-6, 6 January 1944.

▸ *Items Requiring Conservation Emphasis:* As a major factor in winning the war, the AAF is stressing conservation of all types of equipment. Inspectors frequently receive queries as to just what particular items should be given emphasis. The answer is contained in such recent directives as the following:

Solid tires for power operated industrial materials handling equipment. (Sec. VI, WD Cir. 344, 1943.)

All types and sizes of ball and roller bearings. (Letter AG 412.5 (4 Nov. 1943) OB-P-SPMNT-MB-A, 12 Nov. 1943.)

Motor vehicles. (AAF Memo 75-4 and WD Cir. 277, 1943.)

Shellac. (TO 07-1-6.)

Paper. (Sec. II, WD Cir. 302, 1943.)

▸ *Is Your Gun Ready for the Enemy?* Many individual weapons of officers and men are arriving at ports of embarkation in need of repairs. Some weapons must be replaced. A marine considers his rifle his best friend, and AAF personnel should think no less of it. Weapons always should be in fighting shape. ☆

INSPECTING THE INSPECTOR

Is the ability of pilots in your organization being measured in the amount of successful missions accomplished? There is a tendency sometimes to measure ability primarily in the terms of hours flown, which is too often a poor criterion.

Are commanding officers taking the necessary action, prior to departure of military personnel from home stations for overseas duty, to insure that all such personnel are afforded an opportunity to initiate or increase their class B allotment for the purchase of War Bonds? (Sec. VIII, WD Cir. 335, 1943.) Personnel bound overseas should be reminded of the following:

Desirability of each officer and enlisted man to make provision for his future financial security.

Limited need for expenditure of funds abroad.

Additional pay to be received for foreign service.

Have you checked recently to see whether all court-martial forfeitures are actually being collected as prescribed by approved sentences?

Is prompt action being taken by your headquarters to appoint investigating officers to determine the line of duty status of personnel who incur injuries under circumstances which require investigation by an officer? (Sec. III, WD Cir. 342, 1943.)

Is continuing emphasis being given to the AAF physical fitness program? Physical fitness is too important to be excused by the alibi, "Our heavy training program doesn't allow time for it."

Is emphasis being placed on squadron and group assembly, and formation flying?

HERE ARE THE ANSWERS

Q. Do regulations require that enlisted men be inspected as they go on and return from pass or furlough?

A. Yes. Men who do not present a neat appearance will not be allowed to depart, and men who return in an untidy or dirty condition will be disciplined. All officers will observe the appearance of the enlisted men seen on pass or furlough and will report those who are in an untidy or dirty condition. (Par. 16b, AR 600-40.)

Q. Is it possible to receive a furlough in excess of fifteen days when considerable travel time is involved?

A. Under the provisions of Par. 2, AR 615-275, an enlisted man may be granted a furlough of not to exceed fifteen days at any one time. This restriction works a hardship on individuals who are stationed a long distance from their homes. Commanding officers within the continental United States who are authorized to grant furloughs will give consideration to this factor and, when practicable, may for this purpose grant furloughs in excess of fifteen days by the amount of rail travel time involved. (Sec. III, WD Cir. 10, 1944.)

Q. How frequently should the first-aid aeronautic kit be inspected?

A. It should be inspected at the regular daily inspection. (TO 01-1-117, 3 December 1943)

Q. When enlisted men are transferred from one organization to another, what disposition is now made of the unit fund?

A. The fund remains intact with the organization to which it pertains. No funds will be transferred when enlisted men are transferred as part of a cadre from a unit for the purpose of organizing a new unit, or when men who form part of the actual strength of a unit having a fund are transferred to another unit, or when any part of a medical detachment or other Medical Department establishment leaves its station under command of a medical officer for service in the field. (Change 9, Par. 14, AR 210-50, 13 November 1943. Change 9 does not affect or suspend the provisions of Par. 15, AR 210-50, concerning the transfer of funds when a unit is transferred to or from the inactive list.)

Q. The numbering of AAF Letters has been changed. What directive explains the new system?

A. AAF Reg. 5-2, 9 December 1943.

Q. Where is the use of the new Driver's Trip Ticket and Preventive Maintenance Service Record (WD Form 48) explained?

A. In TM 9-2810 entitled, "Motor Vehicle Inspections and Preventive Maintenance Services." The manual also explains Preventive Maintenance Service and Technical Inspection work sheets (WD AGO Forms 461, 462 and 463.)

Q. Does the Red Cross still make loans to enlisted men for the purpose of furloughs?

A. Effective 15 January 1944, the Red Cross discontinued making loans to soldiers for the purpose of furloughs except in cases of emergency *which have been investigated* as provided in Pars. 6c and 7c, AR 850-75. The Red Cross has been compelled to restrict its loans because of the drain on its funds during the past year by soldiers going on furlough prior to embarkation for overseas. (Sec. II, WD Cir. 333, 1943.)

Roll of Honor

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

MEDAL OF HONOR

Kearby, Neel E., Col.
Zeamer, Jay, Jr., Maj.
(Also SS, PH, & AM with 2 OLC)

DISTINGUISHED SERVICE CROSS

Cox, Leonard L., Capt.
Kaufman, Robert B., Sgt. (Also PH)
Post, Arthur L., Maj. (Also DFC & AM)
Waskowitz, Frank T., Lieut.

DISTINGUISHED SERVICE MEDAL

Candee, Robert C., Brig. Gen.
Collins, J. Lawton, Maj. Gen. (& OLC)
Royce, Ralph, Maj. Gen.

LEGION OF MERIT

Beery, Levi L., Col.
Butler, William O., Maj. Gen.
Godfrey, Stuart C., Brig. Gen.
Hills, John de P. T., Lieut. Col.
Huff, Sargent P., Col.
Kraigher, George, Col. (Also AM)
Kristofferson, Henry C., Lieut. Col.
Langmead, Edmund C., Col.
Luedecke, Alvin R., Lieut. Col.
McCoy, George, Jr., Brig. Gen.
Moore, Aubry L., Col.
Paulhamus, Joseph R., T/Sgt.
Puryear, Romulus W., Col.
Raymond, Harry A., M/Sgt.
*Wash, Carlyle H., Brig. Gen.
*Yeomans, John H., Lieut. Col.

SILVER STAR

Anderson, Edward W., Col.
Arnold, George M., Lieut.
Backus, Edward N., Col.
Barber, George A., Lieut.
Barber, Rex T., Lieut. (& OLC)
*Barley, John L., Lieut. (Also AM)
Beck, Francis H., Lieut.
Bolton, Willard L., Lieut.
Boudreaux, Patrick N., Sgt.
Brown, Mason O., Lieut.
Brown, Noble, S/Sgt.
Daniels, Patrick H., III, Lieut. (Also PH)
Davis, Robert E., Lieut.
Dearth, Charles H., Lieut.
Dennis, Stephen C., Lieut.
Downs, Emory Myron, Lieut.
Ferguson, James A., Lieut.
Flagg, Walter Edwin, Capt.
Galusha, Harry L., Capt.
Green, Louis E., Lieut.
Greene, Theodore S., Lieut.
Grottie, George T., Lieut. (Also AM)
Hagan, Crandall H., Lieut.
Hambaugh, Robert F., Lieut.
Hamilton, Merle C., Capt.
Hartzel, James H., Sgt.
Harvey, Frank A., Cpl.
Hedrick, Donald W., Lieut.
Hippert, Robert D., Lieut.
Hoffman, Arthur E., Maj.
Holloway, Bruce K., Col.
Jantzen, Charles D., Lieut.
*Jeffreys, Truman O., Capt.
Kimmel, Robert E., Maj.
Kindall, Lloyd E., Jr., Lieut.
Kirkland, Arvis R., Lieut.
Klemann, Robert B., Lieut.
Koval, Samuel O., Sgt.
Lambert, John L., Maj.
Launder, R. H., Lieut.
McClellan, Wilbur A., T/Sgt.
Madson, Francis Sisman, Capt.
Matson, Rex E., S/Sgt.
Millikin, Robert P., Capt.
Norgaard, Arthur E., S/Sgt.
Patton, Charles H., S/Sgt.
Peck, Alson E., Lieut.
*Penney, John S., Sgt.
Pettigrew, Wesley N., Lieut. (& OLC)
Provenzale, Peter F., Lieut.
Radney, Douglas V., S/Sgt.
Ray, James Andrew, Lieut.
Regan, John M., Maj.
Reiswig, Ralph R., Sgt. (Also DFC & AM)
Rhodes, Earl D., S/Sgt.
Ridings, Donald E., Lieut. Col. (& OLC)
Roberts, John O., T/Sgt. (Also AM)
Robinson, James D., Cpl. (Also AM)
Rodriguez, Alexander G., Lieut. (Also DFC & AM)
Rogers, Albert G., Lieut. (Also DFC & AM)
Rogers, Gerald Talbot, Lieut.
Roman, Stephen J., T/Sgt. (Also AM)
Rowe, William H., Lieut.
Rucker, Jed M., T/Sgt. (Also DFC & AM)
Ruse, John C., Capt.
Sanford, James T., S/Sgt.
Scally, Vincent J., Lieut.
Schafer, Robert T., S/Sgt.
Schestopol, Abe, Lieut.
Schick, Frederick W., Sgt. (Also AM)
Schiel, Frank, Maj.
Schmitt, Arthur W., Maj.
Scott, John W., Cpl.
Shaffer, Joseph D., Lieut.
Slocum, Paul J., Capt.
Smith, Richard E., Lieut.
Smith, Seaborn F., T/Sgt.
Sparks, Kenneth C., Lieut.
Stacy, William W., T/Sgt. (Also AM)
Stapp, Charles R., Lieut. (Also DFC & AM)
Stefanchick, Joseph T., Sgt. (Also AM)
Stewart, John C., Capt.
Stiffler, Norman E., Sgt. (Also DFC & AM)
Stoner, Edgar R., Lieut.
Stowe, Joe D., Sgt. (Also AM)
Stratford, Malcolm G., Lieut. (Also AM)
Street, Clifford G., S/Sgt. (Also AM)
Summers, Clarence E., Capt. (Also DFC & AM)
Summers, Julius B., Jr., Lieut.
Taber, Morris F., Lieut. Col. (Also DFC)
Tamir, Joseph, S/Sgt.
Tarbox, Elmer L., Lieut.
Thomas, Rowan T., Capt. (Also AM)
Thompson, Herman A., Cpl.
Thompson, John A., Capt.
Toomey, John Marshall, Maj. (Also DFC & AM)
Traylor, John H., Maj.
Tubb, Douglas B., Lieut.
Tyson, John, Lieut.
Uber, Clyde S., Lieut. (Also DFC & AM)
Uebel, Edward A., S/Sgt.
Wagner, Furlo S., Capt.
Walker, Ronald R., Col.
Walsh, Joseph Timothy, S/Sgt. (Also DFC & AM)
Walters, James D., Lieut.
Ward, Charles U., S/Sgt.
Watkins, James A., Lieut.
Webb, Allen S., Capt. (Also AM & 2 OLC)
Weiss, Harry J., Jr., Lieut. (Also DFC & AM)
Welfare, Douglas S., Lieut. (Also DFC & AM)
Wellensiek, Otto H., Lieut.
Whitaker, Narce, Maj. (& 2 OLC)
White, Sam B., Jr., Capt. (Also DFC)
Wiese, Edward B., S/Sgt. (Also AM)
Williams, Adam R., S/Sgt.
Williams, Lee R., Jr., Lieut. (Also DFC & AM)
Williams, William H., Sgt. (Also PH)
Williamson, Luther R., T/Sgt. (Also DFC & AM)
Wilson, Robert C., T/Sgt. (Also DFC & AM)
Woltman, Frank H., Lieut.
Wood, Harold E., Cpl.
Yokopenic, Stephen, S/Sgt. (Also DFC, AM & OLC)

PURPLE HEART

Adamski, Joseph W., S/Sgt.
Ahlberg, David A., Cpl.
Ahlin, Bjorn, Lieut.
Albert, James F., Lieut.
Amsterberg, Howard A., Pvt.
Anton, Soren E., Lieut. (Also AM)
Appleman, Don E., Sgt.
Armigo, Lewis, Jr., Pfc.
Armstrong, Howard A., T/Sgt.
Arnkil, Thor V., Lieut.
*Arrison, Frank R., Jr., Lieut. *(Also AM)
Ascol, Holiel, T/Sgt.
Baker, Robert G., Lieut. (Also AM)
Barr, James W., Lieut.
*Bauhof, Arthur Ray, Lieut. *(Also AM)
Beard, John B., Lieut.
Bement, Kenyon T., Maj.
Berg, George G., Pfc.
Berkey, Robert D., Pfc.
Brady, Francis M., Brig. Gen.
Cadwalader, Ward K., T/Sgt.
Caldwell, Charles H., Lieut. Col.
Carothers, William I., Pvt.
Carpenter, Walter G., Sgt.
Connor, Elmer, Cpl.
Crews, John P., W/O
Daugherty, Daniel J., Pvt.
Densmore, Raymond A., Sgt.
Dipaola, August A., Pfc.
Drake, Samuel A., Pvt.
Dyn, Roscoe J., Sgt.
Eisenkel, Max W., Pfc.
Esen, Ernest, Pvt.
Filippi, Anthony, S/Sgt.
Forinash, Cecil L., Capt.
Gagnet, Thomas R., Pvt.
George, Harold H., Brig. Gen.
Gonzalves, Gordon B., Pvt.
*Gradwohl, Jacob, Sgt. *(Also DFC & AM)
Hampton, Edgar W., Maj.
Hanson, Leonard N., Pvt.
Hardin, Steve A., Pvt.
Hattell, Kenneth D., T/Sgt.
Harrington, Leo E., Pvt.
Huguet, Ross N., Capt.
Jordan, Henry E., Pfc.
Kraus, Leon L., Sgt.
Kuiesza, Charles, Jr., Pfc.
Lamb, Samuel S., Lieut. Col.
Lambert, Richard, Sgt.
Larkin, Ralph W., Pvt.
Laster, Floyd F., Sgt.
Lewellyn, Norman J., Maj.
Liden, Arthur V., S/Sgt.
Lynd, William E., Brig. Gen.
McCloud, Simon, Pvt.
McDonald, Cecil H., Pvt.
McDonald, Robert J., Pvt.
McKinney, Ross E., T/Sgt.
McLain, Dennis O., Sgt.
Martin, James E., Pfc.
Mattern, Kenneth E., Pvt.
Merrigan, Daniel G., S/Sgt.
Miller, Wilbur Grant, Maj.
Montgomery, Robert L., Lieut.
*Neeley, Samuel R., Lieut. *(Also DFC)
Nelson, Don L., Sgt.
Nemer, Frank F., Pvt.
Nicholson, Kenneth E., Cpl.
Peddycord, William H., Pvt.
Petersen, Orville J., Pvt.
Peterson, Miland L., Cpl.
Pilson, William H., Pvt.
Porter, John E., Pfc.
Pritchard, Thomas W., Cpl.
Rice, Arthur, S/Sgt. (Also AM)
Robbins, John R., Lieut. (Also AM)
Roberts, Ralph, Jr., Cpl.
Robertson, Donald A., Pvt.
Robinson, Gwynn Herndon, Lieut. (Also AM)
Rosberg, Nils H., S/Sgt.
Roszowski, Joseph W., Sgt.
Rouse, Kenneth, Pvt.
Safran, William, S/Sgt.
Saunders, Laverne G., Brig. Gen. (& OLC)
Schwartz, Monroe P., Lieut. (Also AM)
Seaton, Weldon R., S/Sgt.
Shorthill, Ellis E., Pfc.
Shortridge, William R., Sgt.
Siino, James, Pvt.
Sisneros, Felipe G., Pvt.
Smith, Lewis, Jr., Pvt.
Smith, Samuel S., Pfc.
Snyder, Harry E., Pfc.
*Sowers, Donald P., T/Sgt. *(Also DFC, AM & 3 OLC)
Stafford, George, Pfc.
Stanley, Gregory Q., Lieut.
Stone, John N., Col. (Also OLC to AM)
Storms, Donald Royal, Pvt.
Terrell, Jennings B., Jr., Lieut.
Toka, Andrew, Jr., Pvt.
Vance, Reginald F. C., Lieut. Col.
Vanhouten, George F., Pvt.
Vasey, Louis P., Cpl.
Vautrinot, Donald, Cpl.
Watkins, Percy B., Lieut.
Wayman, Oliver, Lieut.
Wehner, Henry B., Cpl.
Whitt, Donald L., Sgt. (Also AM)
Zitzka, George M., Pvt.

DISTINGUISHED FLYING CROSS

Abbott, Hershell L., Capt. (Also AM & 3 OLC)
Abbott, James M., S/Sgt.
Aguayo, George, T/Sgt.
Anchondo, Rudolph O., T/Sgt.
Anderson, Davis G., Lieut.
Ashkins, Milton H., Maj.
Asmussen, John D., S/Sgt.
Auger, Clifford M., Sgt.
Baird, Donald C., Jr., Lieut.
Baker, Addison E., Lieut. Col.
Baker, Ralph, Lieut. (Also AM & 2 OLC)
Barnard, Robert K., Sgt.
Barnum, Robert A., Capt. (& OLC, AM & 3 OLC)
Bator, Stanley J., Jr., T/Sgt.
Bauman, Francis A., T/Sgt.
Beahan, Kermit King, Lieut.
Beaudry, Theodore C., T/Sgt.
Beekman, Milton R., Lieut. (& OLC)
Beistel, Eugene F., Sgt.
Bellows, Donno C., Lieut.
Benfield, Francis O., S/Sgt.
Berry, Harold F., Capt.
Beuter, Oren A., Jr., T/Sgt.
Bilby, Glade B., Maj. (Also AM & 6 OLC)
Blakely, Warren A., Lieut.
Blucher, Oscar G., Lieut. (Also AM & 3 OLC)
Brady, Francis T., Maj.
Bright, John G., Maj.
Calkins, Lloyd, S/Sgt.
Carney, Roy, S/Sgt.
Cass, George Davis, Lieut.
Castellotti, Julio G., S/Sgt.
Clay, Herman C., T/Sgt.
Clinger, Dallas A., Lieut. (& OLC)
Colvin, John R., Lieut.
Cox, John F., S/Sgt.
Creel, Linton G., S/Sgt.
Crisler, Charles W., Jr., Lieut.
Crooks, William R., Capt.
Cross, Howard L., T/Sgt. (Also AM)
Cummings, John F., Lieut.
Darr, Glenn D., S/Sgt.
Davignon, Norman L., T/Sgt.
De Armond, Donald A., Lieut.
Decolto, Anton R., Lieut.
Decrevel, Charles P., S/Sgt.
Dent, William M., T/Sgt.
Deptula, Anthony T., Capt.
Dick, Thomas C., Lieut.
*Dillon, Barclay H., Jr., Capt.
Dudley, Dana F., Lieut.
Dufour, Jerome P., Lieut.
Edwards, Charles E., S/Sgt.
Epp, Daryl E., Lieut.
Faith, Edgar C., S/Sgt. (& OLC)
Felling, Leslie W., Capt.
Fino, John A., Lieut.
Fisher, Robert L., Lieut.
Foley, John P., Lieut.
Folks, Lowell A., T/Sgt. (& OLC)
Fry, Clyde C., T/Sgt.
Gaines, Harry D., Maj.
Galluzzo, Marino R., S/Sgt.
Giblin, George F., Lieut.
Gilmore, Byron H., Capt. (Also AM)
Gioana, Guido, Lieut.
Godde, Russell H., Lieut.
Greenhalgh, Arthur D., T/Sgt.
Grigg, Warren H., Lieut.
Grothaus, Robert J., Lieut.
Guilford, George E., T/Sgt. (With OLC, AM & 3 OLC)
Gunn, Paul I., Lieut. Col.
Hadden, Will A., Jr., Capt.
Haley, Robert B., Lieut.
Haller, Edward J., T/Sgt.
Hamilton, Otis T., Lieut.
*Harrod, John H., S/Sgt.
*Hawk, Preston M., Lieut.
Hayles, Morris D., T/Sgt.
*Hempe, Herbert F., Lieut. *(Also AM)
Hendrickson, Reuben W., Lieut.
Herring, Fennard L., Jr., Lieut.
Hexberg, Caspar J., Lieut.
Higgins, Bernard A., T/Sgt.
Highfall, Thompson N., Lieut.
Horn, Thomas C., Capt.
Hughes, Charles E., Lieut.
Hyde, Thomas I., Lieut.
Johnson, Robert J., Lieut.
Jones, Harold Hill, Jr., Capt. (& OLC)
Jordan, George W., Lieut.
Karp, Arthur D., Lieut. (& OLC to AM)
Kasparian, Jack W., T/Sgt.
Kendall, Harold K., Lieut.
Kirk, Robert M., T/Sgt. (& OLC)
Kooken, Warren K., S/Sgt.
Koontz, Glenn L., S/Sgt.
Kullman, Martin L., Lieut.
La Morge, Vincent J., T/Sgt.
Lascurettes, George A., Lieut.
Lee, Stanley, Lieut.
Ljunggren, Ernest N., Maj.
Love, William F., Lieut.
MacKay, John A., Lieut.
McCaffery, Robert A., Lieut.
McCash, David E., Lieut.
McDonald, John O., Lieut.
McDonnough, John M., Lieut.
McMullen, William K., Lieut.
McNamara, David A., Lieut.
Macdonald, John A., Lieut.
Maier, Walter, Sgt.
Malinay, Edward B., M/Sgt.

* Posthumous

S/Sgt. Jerome St. John

Col. Neel E. Kearby

Maj. Gen. W. O. Butler

Brig. Gen. G. McCoy, Jr.

Maj. Jay Zeamer, Jr.

Sgt. W. W. Pharr

Mallett, Frank, Sgt.
Manuel, Vernon C., S/Sgt.
(Also AM & OLC)
Marshall, Stanley L., T/Sgt.
Mason, Harley B., Lieut.
Meseke, Granville E., S/Sgt.
Meyer, Norman L., S/Sgt.
Miller, James, Capt.
Minogue, John F., Lieut.
Mooney, Joseph E., T/Sgt. (& OLC)
Murphy, Lloyd J., Capt.
Newbury, Edward S. E., Capt.
Newton, Leroy, S/Sgt.
North, Alexander F., Lieut.
Norton, Frank E., Pvt.
Norvell, John W., Lieut. Col. (Also AM)
O'Brien, John P., Jr., Lieut.
Olliffe, Victor R., Lieut.
Padgett, Kenneth, Lieut. (& OLC)
Palmer, Frederick H., Lieut.
Palmtag, Herbert M., Lieut.
Parker, Charles M., Lieut.
Pate, Leonard S., T/Sgt.
Pawlowski, Edward J., Lieut.
Perry, Clayton L., S/Sgt.
Petersen, Alan E., Lieut. (& OLC)
Peterson, Maurice J., T/Sgt.
Pleasant, Floyd M., T/Sgt. (& OLC)
Pool, James P., F/O
(& OLC, AM & OLC)
Potter, Richard E., Lieut.
Prothe, Kenneth C., T/Sgt.
Redfield, Joseph G., T/Sgt.
Reinhart, Elmer H., Lieut.
Rhoades, Richard Lively, Lieut.
(Also AM)
Riordan, Robert P., Lieut.
(Also AM & 3 OLC)
Risso, Armando P., Sgt. (Also AM)
Ritchie, Perry J., Maj.
Roberts, James F., Jr., Capt.
Robertson, John M., T/Sgt. (Also AM)
Robinson, John W., Maj.
Robinson, William S., Lieut. (Also AM)
Rodgers, Fenton, Lieut. (Also AM)
Rodriguez, Frank L., S/Sgt.
Rolley, Milton, T/Sgt.
Rumsey, Edwin L., Jr., Lieut.
Saia, Joe C., S/Sgt. (Also AM)
Salmon, Charles E., Jr., S/Sgt. (Also AM)
Sawyer, Charles W., Capt.
Sayre, Fred E., Lieut.
Schmidt, Ferdinand R., Lieut. (Also AM)
Schroyer, Dorling D., T/Sgt. (Also AM)
Schwanebeck, Alfred L., Lieut. (Also AM)
Scullion, Donald, Lieut. (Also AM)
Searle, Harold K., Jr., Lieut. (& OLC)
Sharman, Ernest M., Lieut. (Also AM)
Sheffield, Frederick, Lieut.
Shirley, Clarence H., Lieut. (Also AM)
Shryock, Harry L., Lieut. (Also AM)
Sibert, James William, Capt.
Siegfried, William E., Lieut.
Simeral, George A., Lieut.
Simmons, William J., T/Sgt.
Simpson, Robert V., Lieut.
Smith, James C., Lieut.
Smith, Thomas A., S/Sgt. (Also AM)
*Smith, Virgil H., Lieut.
*(With 3 OLC, AM & 3 OLC)
Snyder, Milton A., Jr., S/Sgt.
(Also AM & OLC)
Snyder, Robert R., Lieut.
Solen, Joseph J., S/Sgt. (Also AM)
Sparks, Edwin R., T/Sgt. (Also AM)
Spawn, Douglas W., Capt.
Stark, Harold F., T/Sgt.
Strand, Harry A., T/Sgt.
Sullivan, David L., Lieut. (Also AM)
Susman, Manford C., Lieut. (Also AM)
Sutton, William E., Capt. (Also AM)
Svoboda, Milton J., Lieut. (Also AM)
Swanson, Robert L., Cpl.
Tahsequah, Meech, Lieut. (Also AM)
Tamon, Harvey S., Lieut.
Taulbee, Joseph F., Lieut. (Also AM)
Taylor, Harold R., Lieut. (Also AM)
Taylor, Roy R., S/Sgt. (Also AM)
Teague, Howard J., S/Sgt.
Thacker, Billy, S/Sgt. (Also AM)
Thompson, Walter Bion, Lieut.
Thompson, Wayne W., Capt.
(With OLC & AM)
Todd, Joseph M., Lieut.
Tower, Donald O., Maj.
Townsley, Joseph B., Lieut.
(With OLC, AM & OLC)
Troyanowski, Joseph, S/Sgt. (Also AM)
Tully, Bernard M., Lieut. (Also AM)
Tunno, David A., S/Sgt. (Also AM)
Turner, William J., Lieut. (Also AM)
Tuttle, Richard E., T/Sgt.
Vanness, Harold C., S/Sgt. (Also AM)
Vasquez, Harold E., T/Sgt. (Also AM)
Walker, Harold L., Lieut.
Walker, John R., S/Sgt. (Also AM)
Walters, John I., T/Sgt.
Walters, Louis L., T/Sgt. (Also AM)
Warf, Phineas Y., T/Sgt. (Also AM)
Wash, Allan James, Jr., Lieut.
(Also AM & 3 OLC)
Watson, James Tod, Lieut.
Watson, Ralph John, Capt.
(With 3 OLC, AM & 3 OLC)
Watson, Russell J., S/Sgt.
Weingart, Edward F., S/Sgt. (Also AM)
Wells, Oscar D., Sr., S/Sgt. (Also AM)
Westheimer, David K., Lieut. (Also AM)
Westlund, Sidney, Lieut.
Wheeler, Clermont E., Maj. (Also AM)
Whiffen, Charles F., Jr., Capt.
Whitley, Lacey A., T/Sgt. (Also AM)
Whitlock, George B., Capt. (Also AM)
Whitlock, Hubert H., Lieut.
Wightman, David L., Sgt.
Wilcox, John R., Lieut. (Also AM)
Wilcox, William W., Maj.
Wilkinson, John W., Capt. (Also AM)
Williams, Douglas H., T/Sgt. (Also AM)
Williams, George J., T/Sgt. (Also AM)
Winchell, Lyle S., S/Sgt. (Also AM)
Wingert, Edward H., T/Sgt.
(Also AM & OLC)
Witham, Elmer E., T/Sgt. (Also AM)
Wood, Jack M., Lieut.
(With OLC, AM & OLC)
Wysong, Robert, T/Sgt.
Yates, William James, Capt. (Also AM)
Yuska, Victor A., Lieut. (& 2 OLC)
Zant, Robert W., Lieut. (Also AM)
Zealor, John D., S/Sgt. (Also AM)

OAK LEAF CLUSTER TO DISTINGUISHED FLYING CROSS

Cole, Richard E., Lieut.
Humphries, John R., Jr., Lieut. (Also OLC to AM)
Scott, Robert L., Jr., Col.
Trice, Felix A., S/Sgt. (Also 3 OLC to AM)
White, John B., Lieut.

SOLDIER'S MEDAL

Anderson, Harold F., Lieut.
Arvin, Eugene R., T/Sgt.
Barowsky, William J., S/Sgt.
Birmingham, John W., Sgt.
Bishop, Douglas F., Cpl.
Blessing, Kenneth V., Cpl.
Britt, George E., S/Sgt.
Byers, Ashby C., Jr., Lieut.
Eggers, Fred E., Pvt.
Finch, Stanley, S/Sgt.
Fletcher, John R., Cpl.
Garrison, John E., S/Sgt.
Gifford, William H., Cpl.
Johnson, Harold G., S/Sgt.
Katapodis, George, Cpl.
King, Thomas R., Cpl.
Ledford, William A., Pvt.
Lockwood, Lyman B., Maj.
O'Bryan, William, Lieut.
Pharr, Walter W., Sgt.
Richman, Sidney M., Lieut.
St. John, Jerome, S/Sgt.
Schutrum, Raymond, Sgt.
Scott, Ralph J., S/Sgt.
Shields, Clyde Stanley, Lieut.
Sontag, William, S/Sgt.
Werneken, Frank E., Lieut.

AIR MEDAL

Abels, Joseph L., Lieut.
Adams, Donald W., Lieut. (& 2 OLC)
Adams, Howard F., Capt. (& OLC)
Ade, Robert H., S/Sgt.
Adkins, Lee H., Lieut.
Aitken, John, Jr., Lieut. (& 10 OLC)
Aldrich, Hart W., Lieut.
Alford, Iceal W., Lieut.
Alford, Pierre L., Lieut.
Alger, Harry R., T/Sgt.
Allan, John T., Lieut. (& 6 OLC)
Alleman, Harry G., T/Sgt.
Allen, Delbert S., Sgt.
Allred, Alfred N., Lieut.
Altizer, Robert C., S/Sgt. (& OLC)
Ambrose, Vernon L. R., Sgt.
Ames, Roger J., Lieut.
Amick, Cecil Denham, Lieut. (& OLC)
Ammerman, Floyd B., S/Sgt. (& OLC)
Anderson, James E., T/Sgt. (& 3 OLC)
Anderson, Joseph B., S/Sgt.
Anderson, Lewis C., S/Sgt.
Anderson, William L., Lieut.
Andrews, James A., Jr., Lieut. (& OLC)
Andrews, Ralph F., Lieut. (& OLC)
Anex, Arnold P., Lieut.
Anstine, Robert M., Lieut. (& OLC)
Antwerp, Valain A., S/Sgt.
Archer, Ripley B., Lieut. (& 3 OLC)
Arens, Herbert W., Lieut. (& 3 OLC)
Armstrong, James J., Lieut.
Armstrong, Robert E., Lieut. (& 8 OLC)
Armstrong, Wallace L., S/Sgt.
Arnold, William H., Lieut. (& OLC)
Arnot, David B., M/Sgt. (& 2 OLC)
Asbury, Theodore R., S/Sgt.
Ashley, Milton V., Lieut.
Atack, George J., T/Sgt.
Atteberry, Lloyd E., Lieut. (& 5 OLC)
Austin, William E., S/Sgt. (& OLC)
Averitt, Lawrence, Sgt.
Avery, Lyndall J., Capt.
Babel, John S., Lieut.
Bagley, Thomas C., Capt.
Bailey, Buster, S/Sgt.
*Bailey, Harold M., Lieut. (& 7 OLC)
Bailey, Sherrill T., Capt. (& OLC)
Baird, Guy P., Jr., Capt. (& OLC)
Baird, James K., Capt.
Balcombe, Clayton S., S/Sgt. (& OLC)
Bales, James Y., Cpl. (& OLC)
Balkus, Joseph J., Sgt.
Ballew, Oscar E., S/Sgt. (& 3 OLC)
Balzanelli, Joseph W., Lieut.
Banta, Jack O., Sgt. (& 3 OLC)
Barber, Lavern B., M/Sgt.
Barker, Rex O., T/Sgt.
Barnes, Leonard M., Jr., Col.
Barnes, William S., Lieut. (& OLC)
Barnette, Earl R., S/Sgt. (& OLC)
Barnwell, Charles M., Lieut. (& 2 OLC)
Barrere, Robert A., Capt.
Bartlett, Keith O., Lieut. (& OLC)
Barto, Frank J., Sgt. (& 2 OLC)
Barton, Theodore, Lieut.
Battenfield, Amos G., Lieut.
Battersby, Hiram E., Lieut.
Bauer, Claude M., T/Sgt. (& 2 OLC)
Bliven, Walter L., Jr., S/Sgt.
Beck, Frederick C., Lieut. (& OLC)
Bogdon, Charles, S/Sgt. (& OLC)
Bohl, Joseph P., Maj.
Bohland, Richard L., S/Sgt. (& 3 OLC)
Bombenek, Philip Y., Lieut. (& OLC)
Bonawitz, Norval C., Lieut. Col.
Booker, Cleiborn U., S/Sgt. (& 3 OLC)
Bourgeois, Girard W., Lieut.
Bromley, John, Jr., Capt.
Brown, Leonard H., Lieut. (& 6 OLC)
Brownell, Lloyd G., Lieut.
Buell, Rudolph L., Lieut.
Burchette, Robert W., S/Sgt.
Burns, Robert W., Lieut. Col.
Burrows, James H., Jr., S/Sgt.
(& 2 OLC)
*Butterbach, John R., S/Sgt.
Cain, Clarence C., Capt.
Campbell, Richard A., Lieut. (& 15 OLC)
Carpenter, Donald, S/Sgt. (& 2 OLC)
Carpenter, Woodward B., Capt.
Carraway, Alfred B., S/Sgt.
Carringer, James R., Jr., Lieut.
Carroll, Wesley M., Lieut.
Chobkowski, Stanley R., S/Sgt.
Cieri, Eugene L., Cpl.
Clagett, Henry C. B., Jr., Capt.
Coleman, Robert M., Lieut.
Conklin, Howard E., Capt.
Conley, Allen Joseph, Capt.
Connally, Adrian, S/Sgt.
Copeland, Robert D., S/Sgt. (& 2 OLC)
Correll, James E., W/O (jg) (& 2 OLC)
Courcelle, Frederick M., T/Sgt.
Cox, Morgen H., Jr., Capt.
Crane, Paul Clinton, Lieut.
Dabrowski, Stephen J., Lieut.
Dahlquist, Stanley T., Lieut.
Dallmann, Orrin F., S/Sgt.
Damm, Vergil, S/Sgt.
Daniel, William G., S/Sgt.
Davis, Francis A., Lieut.
Davis, Samuel Jefferson, Col.
Deaton, William W., Capt.
Declercque, Donald A., Lieut.
Delaney, Charles W., Lieut.
'De Masters, Earl N., S/Sgt. (& OLC)
Demchok, Andrew J., S/Sgt.
De Moss, Lloyd K., Capt. (& 11 OLC)
Dengate, Frank C., S/Sgt.
Deuchare, Daniel D., Lieut.
Dickerson, Jack M., Capt.
Diehl, George R., S/Sgt.
Dietz, Linas E., Sgt.
Domijan, Leo, Capt.
Dorgan, Harold K., Lieut.
Dougherty, Russell R., Lieut.
Downing, Wilbur S., T/Sgt.
Dufault, William F., Capt.
Dumas, Halsay W., S/Sgt. (& OLC)
Dunlap, Marcus M., T/Sgt.
Duster, Leonard F., S/Sgt. (& 2 OLC)
Dutton, Carleton C., Capt. (& OLC)
Dykes, Leo M., Lieut. (& OLC)
Dykstra, George E., Lieut.
Eley, Carl W., Lieut.
Elliott, Dana B., Capt.
Elliott, George E., Lieut.
Elrod, Carlyle C., S/Sgt. (& 2 OLC)
Erickson, Carl E., Lieut.
Ericson, Edward W., S/Sgt. (& 2 OLC)
Esmond, Thomas M., Lieut. (& OLC)
*Ewold, Allan J., Lieut. (& 4 OLC)
Fedderson, Glenn M., Lieut.
Fenton, Donald C., Lieut.
Field, Richard A., Capt.
Firestone, Clinton D., Jr., Capt.
Fisher, Sheldon, Lieut.
Flahaven, Buford E., Lieut.
Flautt, Jack Graham, Lieut. (& OLC)
Flood, William S., Lieut.
Florcyk, Edwin A., Lieut.
Focht, Richard F., Lieut.
Foley, Robert Patrick, Lieut. (& OLC)
Forehand, Charles C., Jr., S/Sgt.
Fort, Charles H., Jr., T/Sgt.
Foster, Stanley M., Lieut.
Fowler, Robert Allen, Lieut. (& OLC)
Frame, Vernon M., S/Sgt.
Franche, Lawrence F., T/Sgt.
Gallup, Golden M., S/Sgt.
Garanflo, Thomas J., Lieut.
Gates, Spencer, Lieut.
Geil, Thomas W., Capt.
Gentry, Edgar N., Lieut.
Germain, Arthur M., S/Sgt.
Gett, James L., T/Sgt.
Gilliland, James V., Lieut.
Ginnane, Edmund G., Lieut.
Glassman, Frank, S/Sgt. (& OLC)
Glaubitz, Rale A., S/Sgt. (& OLC)
Goldsmith, Merle A., T/Sgt.
Goodman, William, T/Sgt.
Granahan, Patrick J., T/Sgt.
Green, Edwin S., Maj. (& OLC)
Greenwald, Henry J., Lieut.
Gregory, Samuel T., Lieut.
Griffin, William J., Sgt.
Grimes, Corwin C., Capt.
Grissom, Paul D., T/Sgt.
Guiberson, Nathaniel G., Jr., Lieut.
Hagreen, Robert J., Lieut.
Hamilton, Ray T., S/Sgt.
Hanes, William E., Capt. (& 11 OLC)
Hannah, Manton, Jr., Lieut.
Hansen, Svend J. W., Sgt. (& 3 OLC)
Hanson, Wayne A., Maj.
Harp, Del, S/Sgt.
Hartley, John A., S/Sgt. (& OLC)
Hawkins, Waldemer L., Jr., Capt.
Heacock, Amos E., Capt. (& OLC)
Hennefent, Karl O., Capt.
Herbert, Alvin Edward, Lieut. Col.
Henry, Cecil Paul, Lieut. (& OLC)
Hidalgo, Hector R. Vega, Sgt.
Hilgart, Patrick J., S/Sgt. (& OLC)
Hoefler, George E., Lieut.
*Hoke, Walter L., Lieut. (& 8 OLC)
Holland, Robert W., Lieut. (& OLC)
Holloway, Raleigh W., S/Sgt. (& 3 OLC)
Homeyer, Marvin F., S/Sgt. (& OLC)
Hood, Ray A., S/Sgt.
*Hopper, George E., Sgt. (& 2 OLC)
Hopper, Troy A., S/Sgt. (& OLC)
Howell, Donald J., S/Sgt. (& 2 OLC)
Hriczko, Michael, Jr., Lieut.
Hughes, Bill Dean, Lieut.
Iverson, Orville K., S/Sgt.
Ivins, Anthony H., Capt.
Jenkins, Robert H., Lieut.
Jett, James L., T/Sgt.
John, Harry P., Lieut.
Jones, Harry S., Lieut.
Johnson, Charles R., Sgt.
Johnson, Johannes H., T/Sgt.
Jones, Harry E., Jr., Capt.
Jones, Wendell L., Capt.
Judson, Curtiss, T/Sgt.
Kamhi, Ralph, Lieut.
Kearns, Thomas E., Lieut. (& OLC)
*Kemp, E. H., T/Sgt.
Kennyhertz, Charles L., T/Sgt.
Kenworthy, Charles C., Jr., Capt.
(& 7 OLC)
Kilpatrick, Kenneth F., Lieut. (Inf.)
Kirby, David J., Capt.
Kissel, Robert J., Lieut.
Kizer, Curtis Alden, Lieut. (& OLC)
Klump, Virgil, Lieut.
Knipp, Arthur S., Sgt. (& OLC)
Knox, William A., Lieut.
Kozon, Lutzy A., Lieut.
Krebs, Laurence F., Capt.
La Montagne, Robert L., Lieut.
Latimer, Will F., Jr., Capt.
Laughlin, Fentice L., S/Sgt.
Lavalle, Carl J., Lieut.
Lawley, Robert L., Jr., Capt.
Le May, Curtis E., Brig. Gen.
Lewis, Roy, S/Sgt.

(Continued on Next Page)

Maj. A. L. Post

Capt. F. S. Wagner

Lt. P. B. Watkins

Capt. W. J. Yates

Lt. R. W. Zant

T/Sgt. V. C. Manuel

Roll of Honor

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

Lieb, John J., Lieut.
Lindblom, Ernest O., Capt.
Lippincott, Elwood T., Capt.
Loneryan, Robert L., Sgt.
Long, Lewis C., Capt.
Low, Zehnder S., Sgt.
Lund, Nicholas H., Lieut.
McCloskey, James R., Lieut. (& OLC)
McConnell, Harold H., Lieut.
McCrary, Robert R., Capt.
McDonnell, Joseph L., Sgt.
McGauhey, Robert B., Lieut. (& OLC)
McKee, George B., S/Sgt.
McNamara, Francis P., S/Sgt.
McNeese, Harold G., Lieut.
Mackinnon, Roderick P., Lieut.
Magness, Woodrow W., Lieut.
Mahon, James E., Capt.
Manogue, Lloyd K., Lieut. (& OLC)
Massengale, William M., Lieut. (& OLC)
Mays, James H., S/Sgt.
Mazonowski, Raymond J., Lieut. (& OLC)
Mead, John B., Lieut.
Mellor, Harrison C., Lieut.
Merrifield, Lewis B., Jr., Capt.
Miedowski, Stanislaus J., T/Sgt.
Milledge, Henry L., Capt. (& 2 OLC)
Miller, Arthur L., Capt.
Miller, Robert F., Lieut.
Moore, Jason H., Capt.
Moore, John W., Capt.
*Morris, Loren, S/Sgt.
Murphy, John J., Lieut.
Nelson, Robert P., Lieut.
Newman, Jeff D., Lieut.
Newman, Ulmer J., Capt.
Newton, Jack A., Lieut.
Nichols, John D., Jr., Lieut.
Nicholson, James W., Lieut.
Nickels, Loren S., Capt.
Nowell, John M., Jr., Lieut.
O'Donovan, Edward D., Lieut.
O'Neill, Charles T., Lieut. (& 2 OLC)
Osborne, Frank E., T/Sgt.
Osborne, Glenn C., Lieut.
Osborne, Ivan M., Lieut. (& OLC)
*Owen, Albert E., Sgt.
Owings, Sheldon S., S/Sgt.
Parker, David E., Lieut. (& OLC)
Pascual, Raymond, Lieut.
Patton, William W., Capt. (& OLC)
Payton, Moses, Lieut.
*Pendleton, Alexander B., Lieut. Col.
Perry, Roy G., Capt.
Peters, Andrew S., Lieut.
*Pierce, Fleming D., Jr., Lieut.
Pinney, Norman W., Jr., Lieut.
Platts, Howard M., Lieut.
Price, Andrew H., Capt.
Putnam, Henry W., Capt.
Putney, William W., Lieut.
Radford, George G., Lieut.
Ralph, John H., Lieut.
Ray, Wilbur Richard, Capt.
Redick, Thomas W., Lieut.
Reed, Bill J., Lieut. (& 3 OLC)
Reed, James H., Lieut.
Reid, James H., Lieut.
Reiss, Wilfred C., Lieut. (& OLC)
Remling, Milton L., Lieut.
Reynolds, Giles W., Lieut.
Rich, Nelson V., S/Sgt. (& OLC)
Riley, Edward A., Lieut. (& OLC)
Riley, Robert Kenneth, Sgt. (& 3 OLC)
Robbins, Edward F., Sgt.
Robbins, Herbert, T/Sgt. (& 3 OLC)
Roberts, Aaron B., S/Sgt.
Roberts, James C., T/Sgt.
Roberts, William K., Lieut. (& 3 OLC)
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Robinson, Robert T., Lieut.
Robinson, William E., Jr., S/Sgt.
Roddy, Vincent J., Lieut.
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Rowe, Russell W., Lieut.
*Rowland, James McDonald, Lieut.
Roy, Joseph Stanley, Sgt. (& 3 OLC)
*Ruchti, James F., Lieut. (& 2 OLC)
Ruettiger, Daniel O., Sgt. (& 2 OLC)
Rugee, John W., Capt.
Rushing, Ben H., Lieut. (& 2 OLC)

Russell, Norman, Lieut.
Rutt, Donald H., S/Sgt.
Rybarczyk, Luke S., Lieut.
Ryden, Donald A., Lieut.
Sachs, Morton L., Lieut.
St. Pierre, Arthur M., S/Sgt.
Salmon, Walter, Jr., S/Sgt.
Salvo, Alberto, Sgt. (& OLC)
Salvo, Samuel J., Sgt.
Sama, Frank, Cpl.
Sammons, James Nile, Lieut. (& OLC)
Sanders, John J., Lieut.
Sanny, Max J., Lieut.
Sarles, John E., Lieut.
Sarpolus, Sam T., Sgt. (& 3 OLC)
Saunders, Hal A., Lieut.
Schafer, Robert T., S/Sgt.
Schapse, Paul, Sgt.
Scherff, Raymond G., Lieut.
Schippang, Alvin T., S/Sgt. (& 3 OLC)
Schley, Cooper M., Lieut. (& 3 OLC)
Schmeizer, Paul C., Sgt. (& OLC)
Schonzeit, Marvin, Lieut.
Schreiber, Stanley E., Lieut. (& OLC)
Schuerman, Donald S., Lieut.
*Schuman, John P., Lieut.
Scott, Richard E., Lieut.
Seamans, Robert R., Lieut.
Seddon, Oscar E., Sgt.
Seelmann, Frederick G., Jr., Lieut.
Seelos, Robert, Lieut. (& 3 OLC)
Sekac, Vincent F., S/Sgt.
Sellars, Fred J., Lieut.
Severson, Orlando W., Lieut.
Seymour, Charles L., Lieut.
Shaffer, Abram B., Lieut. (& OLC)
Shaffrath, Paul W., Lieut.
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Shaughnessy, James V., Sgt. (& 2 OLC)
Sherman, Donald S., Lieut.
Shipman, Mark K., Lieut. (& 3 OLC)
Shirey, Wayne T., Lieut.
Shoaff, Douglas K., Pfc.
Shores, Von Roy, Jr., Col.
Shull, Charles G., Jr., Lieut.
Shumard, Richard E., S/Sgt. (& 2 OLC)
Shurig, Robert Charles, Lieut. (& 2 OLC)
Shy, William M., Lieut.
Silverstein, Seymour, Lieut.
Simmons, Mabry, Capt.
Simons, Norton, Sgt.
Simpson, Edward W., S/Sgt.
Simpson, Robert M., Lieut.
Simpson, Robert T., IV, Capt.
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Skelton, Earl, F/O
Skinner, Carl F., Lieut.
Slaughter, Charles W., Lieut. (& OLC)
Slentz, John H., T/Sgt.
Smith, Brandon C., Lieut.
Smith, Clark W., Lieut. (& OLC)
Smith, Fauad J., Sgt.
Smith, Lawrence P., Lieut.
Smith, Wallace M., Sgt. (& OLC)
Smith, William A., Lieut.
Snook, Lester B., Sgt. (& 3 OLC)
Snyder, Howard H., Lieut. (& 3 OLC)
Snyder, Raymond J., Jr., Lieut.
Solberg, Frederic, S/Sgt.
Somerville, Everett R., Lieut.
Sorenson, Victor H., Lieut.
Souder, Paul B., Jr., Sgt.
Southard, Harold Lucas, Lieut.
Spadone, Charles D., Lieut.
Spellman, John F., Jr., Sgt. (& 3 OLC)
Sperber, Michael, Lieut.
Spetch, Edward T., T/Sgt. (& 3 OLC)
Spindler, Frank L., S/Sgt.
Spratley, Richard S., T/Sgt. (& OLC)
Srsen, Myron C., S/Sgt. (& 2 OLC)
Staerk, James C., S/Sgt.

Stanczyk, Bruno C., S/Sgt. (& OLC)
Standart, Joseph G., Capt.
Stapleton, Mello, T/Sgt.
Stearns, William A., S/Sgt.
Stebbins, John H., Lieut.
Steers, Frank B., Jr., Sgt. (& 3 OLC)
Steffens, Debert G., Sgt. (& OLC)
Stefonowicz, Clifford L., Lieut.
Stege, John A., Lieut. (& 2 OLC)
Steineder, Wayne G., Lieut.
Steinemann, Frank C., Lieut.
Stephens, Joseph J., Capt.
Sterkel, Harry A., Lieut. (& OLC)
Stevens, Edgar L. H., Jr., Lieut.
Stewart, William, III, Lieut.
Stiglitz, Hyman L., S/Sgt.
Stinson, Walter Dale, Sgt. (& 3 OLC)
Stockton, Donald E., Lieut. (& 3 OLC)
Stocum, Donald Gordon, Lieut. (& 3 OLC)
Story, Daniel A., Lieut.
Strange, James W., S/Sgt.
Stuart, Aurel E., Lieut.
Stubbs, James Woodrow, Lieut. (& 3 OLC)
Sullivan, Arthur A., Sgt. (& 2 OLC)
Sullivan, Woodruff, Jr., Lieut.
Sutton, Joseph, T/Sgt.
Swift, Gerald E. F., Sgt. (& 3 OLC)
Swindle, Robert J., Lieut.
Taber, Elwyn L., Lieut.
Tacket, Cecil E., Capt.
Tainsh, Alexander S., Capt. (& 3 OLC)
Talbert, Julius A., S/Sgt.
Tarnosky, John A., Pvt.
Tate, Clark A., Lieut. (& 2 OLC)
Taylor, Arthur G., Capt.
Taylor, Earl K., T/Sgt.
Taylor, Horace C., Lieut.
Taylor, James P., Lieut.
Terry, Charles R., T/Sgt. (& OLC)
Terry, Harvey N., Jr., T/Sgt.
Terry, Robert D., Lieut.
Tetiva, Erwin J., Capt. (& OLC)
Thacker, Clarence L., Lieut. (& 3 OLC)
Thayer, Harold A., Lieut.
Thomas, Clarence W., Capt.
Thomas, George P., T/Sgt.
Thompson, Berry P., Lieut.
Thompson, Donald Lee, Lieut.
Thompson, Earl William, Sgt. (& 3 OLC)
Thompson, Jack P., Lieut.
Thompson, John T., Lieut.
Thompson, Kermith N., T/Sgt.
Thornton, Allan C., Pfc.
Tibbits, Thomas P., Sgt.
Tikotsky, Stanley S., Lieut.
Tollen, James R., Lieut.
Tomlin, Aubrey C., S/Sgt.
Townsend, Franklyn, Sgt. (& 3 OLC)
Trapani, Philip P., Sgt. (& 2 OLC)
Trearse, Albert, Capt.
Trusevitch, Edward, S/Sgt.
Turner, Alfred George, Lieut.
Tuttle, Richard B., Lieut.
Tylka, Adolph A., S/Sgt.
Tyrrell, Vern H., T/Sgt. (& OLC)
*Unruh, Jonas C., S/Sgt.
Uriegas, Valentino M., Cpl.
Vallorani, John J., Sgt. (& OLC)
Van Buskirk, Alden L., Capt.
Vandergriff, Harry I., Sgt. (& 2 OLC)
Vanderslice, Harvey R., Lieut.
Vanglider, Taylor H., T/Sgt.
Van Horn, Max E., S/Sgt.
Van Valkenburg, Edgar, S/Sgt. (& OLC)
Ventres, Domenic Ralph, Lieut.
Verner, William L., S/Sgt.
Vick, Glen F., Capt.
Villenes, Colin O., Lieut.
Voellmeck, Joseph W., Lieut.
Vonarx, Leonard L., T/Sgt.
Wade, Charles R., Lieut.
Wadlin, Robert F., Lieut.

Wagner, Earl L., Sgt.
Wagner, Lee H., Lieut.
Wagner, Lloyd E., S/Sgt.
Waibel, Edward J., Sgt. (& 3 OLC)
Walker, Chauncey Leavan, Lieut.
Walker, George T., Capt.
Wallace, Hampton K., Capt.
Walles, Wade C., Jr., Capt. (& 3 OLC)
Walsh, Harold F., Lieut.
Walsh, Mortimer V., Lieut. (& 2 OLC)
Walthers, George A., Lieut.
Walthers, William, F/O
Wangeman, Herbert O., Maj. (& 3 OLC)
Ward, Whitney M., S/Sgt.
Watson, James T., Lieut. (& 3 OLC)
Watson, James Wilson, Lieut.
*Watson, William S., Lieut.
Weakland, Walter L., Lieut.
Weaver, Paul B., Jr., F/O
Webb, Wateman J., Lieut. (& OLC)
Wechsler, Lawrence A., Lieut. (& OLC)
Weems, Thomas N., Jr., Lieut.
Weilbacher, Karl A., Capt. (& OLC)
Weirback, Roland C., Lieut.
Welkis, Eli, Cpl. (& OLC)
Weller, Charles E., Lieut.
Wellin, Seymour W., Lieut.
Wells, Deles L., Sgt.
Wekwert, Ervin E., Sgt.
Wells, John C., Jr., Lieut.
Westerman, Bernard T., Lieut.
Wetzler, Donald M., Lieut.
Wheaton, Robert M., Lieut.
Wheeler, Ray L., T/Sgt.
Whitcher, Lawrence G., Capt.
White, George T., Lieut. (& OLC)
*White, Raymond S., T/Sgt.
White, Zelma E., Sgt. (& 2 OLC)
*Whittington, Leonard H., Lieut.
Wilkerson, Steven R., Capt.
Wilkins, Russel E., Lieut.
Williams, Carl T., Jr., Lieut. (& OLC)
Williams, Dav W., Lieut. (& 3 OLC)
Williams, Donald G., Lieut.
Williams, Edler D., S/Sgt.
Williams, Frank E., Lieut.
Williams, George R., Sgt.
Williams, Lee M., Lieut.
Williams, Lester H., T/Sgt.
Williams, Robert T., Lieut. (& OLC)
Willis, H. G., Lieut. (& OLC)
Wilson, Donald E., Lieut.
Wilson, Frederick M., Sgt. (& 3 OLC)
Wilson, Wilbert L., Lieut.
Winchell, Clarence H., S/Sgt. (& 3 OLC)
Winey, Wilford J., Pvt.
Wintermyer, Newman W., Lieut.
Wirt, Richard K., Sgt.
Wohlers, Albert H., Capt.
Wolf, Gomer A., Lieut.
Wood, Allen H., Lieut. (& OLC)
Wood, William L., Jr., Lieut. (& 3 OLC)
Woodhull, Benjamin T., Lieut. (& OLC)
Woods, Lyle C., T/Sgt. (& OLC)
Woodward, Ellis M., Lieut.
Woodward, Robert H., Lieut. (& OLC)
Woody, John K., Lieut. (& 2 OLC)
Word, Harrison G., Capt.
Working, William H., Lieut. (& 3 OLC)
Worrell, Samuel H., Jr., Cpl. (& OLC)
Wright, Ellis W., Jr., Capt.
Wright, John R., Capt.
Wright, Robert W., Lieut.
Wright, Wilbur J., Sgt. (& 3 OLC)
Wronski, John T., Sgt. (& 3 OLC)
Wuethrich, John W., Jr., Lieut.
Wunneberger, Arnold L., Lieut.
Wyatt, Bert W., Lieut.
Wyatt, Kenneth C., S/Sgt.
Wylie, James W., Capt. (& OLC)
Wyman, George H., Capt.
Wynne, Henry Champange, Sgt. (& 3 OLC)
Yandala, Gust J., Lieut.
Yates, Leo M., Lieut. (& OLC)
Yates, Milton, S/Sgt.
Yinger, Robert L., T/Sgt.
Yost, Clifford H., Sgt. (& 3 OLC)
Young, James E., Lieut.
Yuravich, Joseph A., Capt.
Zaorski, Roman R., T/Sgt. (& 3 OLC)
Zaresky, Jack, Sgt.
*Zeglin, Joseph J., S/Sgt. (& OLC)
Zeran, Royalton, Sgt. (& OLC)
Ziegler, Paul A., Jr., Lieut. (& 2 OLC)

S/Sgt. E. Van Valkenburg

Maj. J. M. Toomey

Lt. Clyde S. Uber

Col. B. K. Holloway

Maj. W. A. Hanson

Lt. P. F. Provenzale

CAMOUFLAGE WITH HORSE SENSE

By Lieut. Col. Merrill E. DeLonge

AAF Representative, Engineer Board, Ft. Belvoir, Va.

Camouflage, as the lecturers in basic training point out, is *protective concealment,* and its practice and theory in a theatre of war depends on the use of a large amount of horse sense. The whole idea is to make it hard for the enemy to see you, and to bomb or strafe you. The art of deception is also an integral part of camouflage and it can prove of value during offensive operations as well as when defensive measures are necessary.

In the Mediterranean and Pacific theatres we have found out a number of things about camouflage—what it can and can't do. For example, it was noted that for a while artificial concealment wasn't used to any extent by AAF personnel, *and, too, that many men were indifferent* to all kinds of concealment, natural or hand-made. Quite a few of these diffident characters are now dead or in hospitals.

Some of this indifference toward camouflage may have resulted from the uncontrolled enthusiasm of the men who first expounded the art of hiding objects from the enemy. A few of the pronouncements of these men led to the mistaken idea that they could make things invisible: a few dabs of paint here, a fishnet waved around a few times and buildings, airplanes and mechanics would be whisked from view. Just like that.

However, if a person will listen closely to the camoufleurs, he will find that they don't expect miracles and that they do have some ideas which will keep the Jap and Germans from breathing down our necks. He will find, too, that the ideas of the camouflage personnel are relatively simple and are based on good sense.

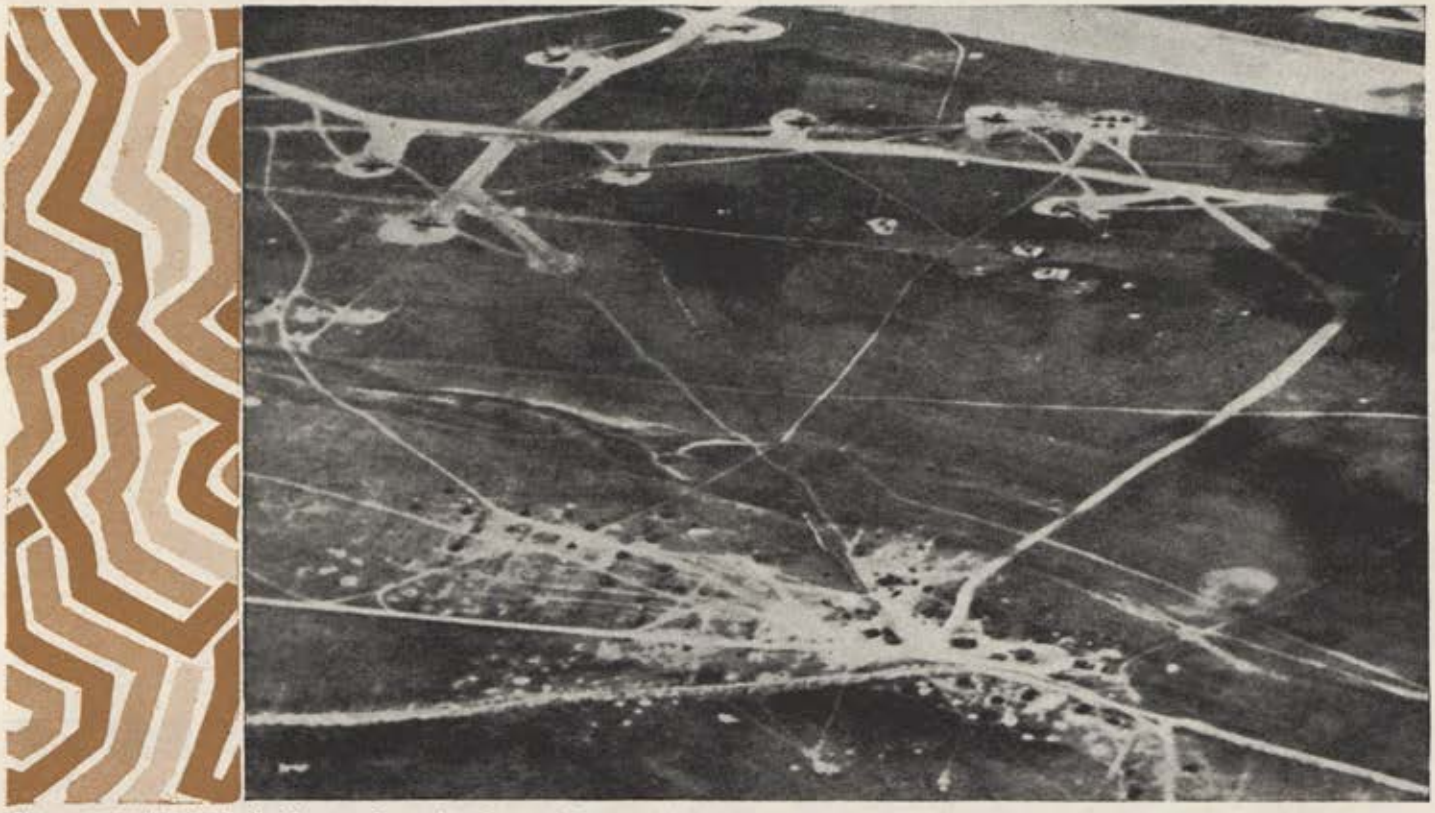
The protective concealment they speak of is, actually, *self-preservation* and *deception.* The idea is to make it difficult for the enemy to locate and bomb concentrations of airplanes, equipment or men. There also is the important point of misleading him as to just how many men there are at an installation, what planes are on the field and how much gasoline, bombs and other equipment is on hand.

A good way to judge how important the basic elements which are closely associated with camouflage are to your survival is to look over a few of the enemy's mistakes. Think of that fine target a bunch of JU-88s made for a squadron of B-26s one day. The 88s were lined up close, almost wingtip to wingtip, and as the Marauders laid sticks of 300-pound bombs among them there went a group of Germany's most valuable planes, caught on the ground. Think, too, of bomb and gasoline dumps going up in great explosions, of hundreds of Japanese killed by one strafing mission over a tent bivouac area.

Not long ago, a flight of P-40s, hitting the deck all the way out, came right up on a battery of ack-ack on a hill, and every one of the enemy's guns and all their crews were put out of action. This attack wasn't just a piece of good luck. It came about this way: A photo reconnaissance plane had run a strip over that part of the island, looking for such defenses. The battery showed up bright and clear because the gun crews had been lazy and had liked to take short cuts. There were three well-marked trails up the hill, pointing straight to the positions. Besides, the crews had been careless about tramping around the guns, and white patches showed in the photo just where the AA guns were located.

With all those markings, it was a relatively easy job for the P-40s to head right for the battery and knock it out. The Jap gunners are dead because they were indifferent about some of the first rules of protective concealment.

When the enemy bombs you, he is after three things: planes, other equipment and personnel. One way to cross him up is to scatter everything over the landscape. It may be a bit inconvenient, having 55-



There was a definite lack of camouflage discipline at this airfield in North Africa. Notice the scarred areas around the B-17s and tent bivouac and note especially the telling trails. Good dispersal of the bombers minimizes the probable damage in the event of an air attack.

gallon drums of gasoline placed yards apart over a large area, but it is better than having all your gasoline go up with one bomb hit. If reasonable dispersion has been carried out at a forward base, it will be tough for the enemy to knock the fields out of action. And then if the same precautions are taken with tents and shelters in the bivouac, an enemy is going to have a hard time doing much anti-personnel work with his machine guns.

WHEN you move into a new field, it is a good idea to look around a little and pick out a spot where you can dig in or be covered so that a Jap or a German can't see you from a couple of miles away. This sounds a little easy, but it takes time and careful planning to do it right—and it's the job of everyone in the new area.

Artificial cover is helpful, but it takes a lot of time and work to put up fishnets, garnish them properly and, as the months go by, change the garnishing to fit the seasons—green for spring and summer, brown for fall and winter. For similar reasons, large scale airfield camouflage is even more difficult to do. So if possible, seek areas where there is natural cover and save all the trees and local garnish you can.

Airplanes and equipment hidden among trees are almost impossible to see from the air, and if care is taken they will not show up on a photographic plate.

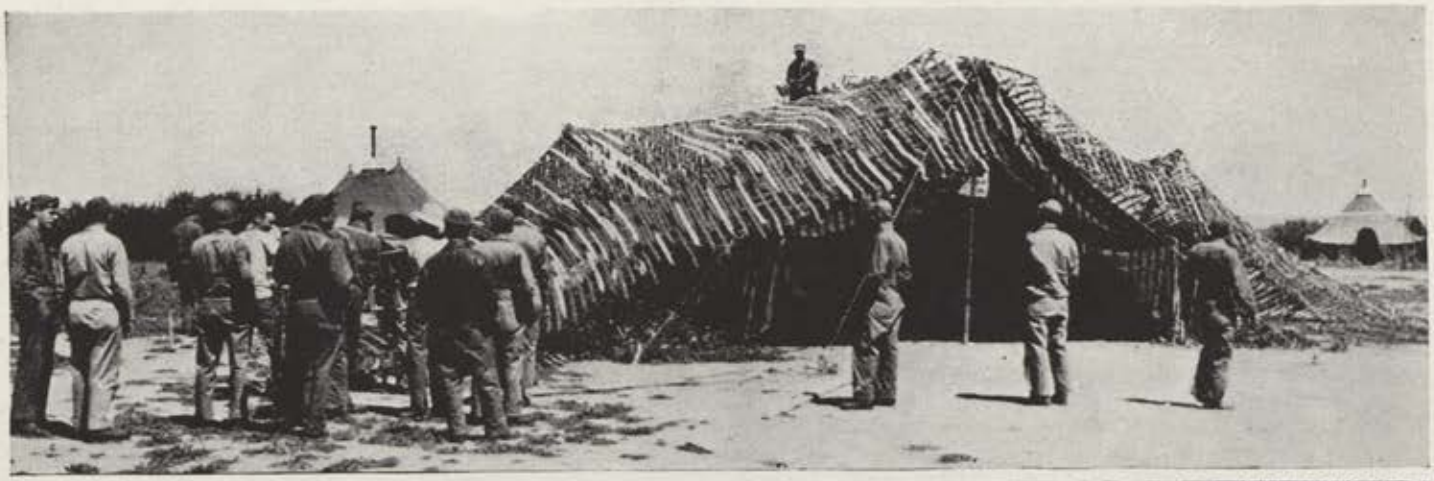
Another good rule after a bivouac has been set up is to avoid cutting too many trails and roads which can be seen from above. Sometimes it isn't easy to find localities with good natural shelter, and in those places some effort should be made to cover equipment and buildings with garnished nets. The main idea is not so much to hide whatever you are covering but to make it less noticeable to a reconnaissance plane. An airplane's shadow stands out as clearly, or more so, than an airplane. So reduce the shadow.

While you can see through a garnished net from below, it does a lot of good in absorbing the shadows or breaking the lines of a truck or plane as seen from above. It is important when using a net that it be stretched over the object, and, better, yet, even raised so it does not rest on the tent ridge, or truck top, or the top point of whatever you are concealing. If there aren't enough nets to go around, it is best to use them over tech vans, radio trucks and equipment that is hard to replace if destroyed.

Use all existing buildings and roads. Where new buildings are constructed, design and arrange them so that they will appear to be a part of the area. Any painting that is done should either blend the buildings into the background or make them appear like any other buildings in the vicinity. These basic rules hold true in China, New Guinea, Italy and wherever else the AAF is fighting.

This all sounds pretty fundamental, and it is. It might even mean saving your neck. ☆

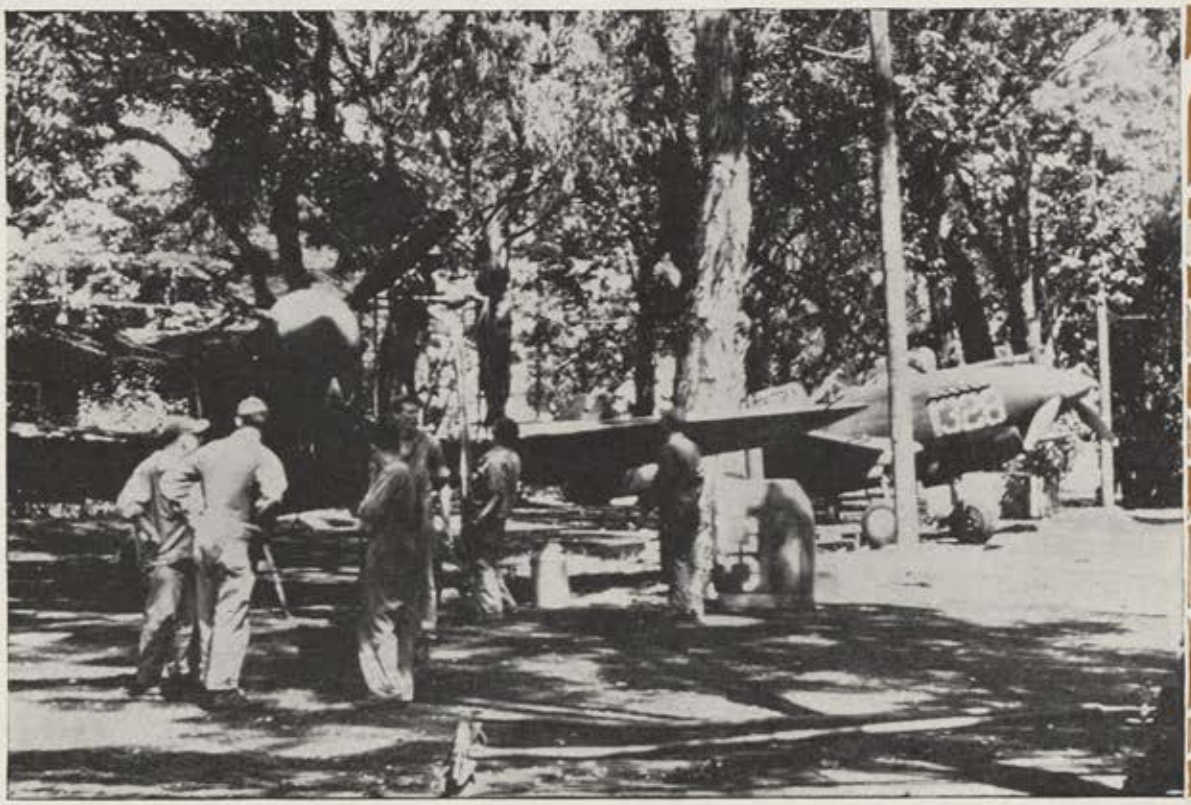
Little or no natural cover was available at this bivouac on a North African airfield but the men moving in had to make the best of it. They had to keep living quarters separated and installations dispersed so that bombers or strafing planes would not have concentrated targets.



An excellent job of garnishing is being done on this drape job over an operations tent of a heavy bombardment group. The net has been spread so that outlines are vague when seen from the air and the garnish has been dyed to blend well with the terrain. No telltale shadows are cast.

Replacement engines are rare and valuable in places like New Guinea and the ground men learn to protect them. In this case, the engines have been well scattered. The covering gives concealment and protection against weather. This is better than storing the engines side by side in a small area where a well-placed bomb has a chance of destroying the entire stock.

Whoever chose this spot for the maintenance area of a fighter squadron on Oahu appreciated protective concealment. The trees offer excellent cover against observation from the air, yet there is room enough for the mechs to work. Besides it is cool, a luxury not often enjoyed in this area.



Eskimos are clever, laughing people with fine respect for the property rights of others—including the AAF. Although they had seen hundreds of planes, the jeep was something entirely new. They enjoyed their ride.

On the flight from the States to Bluie West One airbase in Greenland scenes like this one form a panorama of interesting patterns, glittering mountains of craggy ice afloat on the dark, dull blue water of the North Atlantic. It was the gliding shadow of the plane on an iceberg which inspired this sketch.

AIR WAR'S TOUCH IN THE NORTH COUNTRY

In many respects Army Air Forces personnel stationed at hopping-off bases along arctic routes of the Air Transport Command live a life far-removed from active combat, but their basic mission in this war is wrapped up in thousands of bombers, fighters and transport planes which they help over the tough North Atlantic to fighting areas. During a recent visit, Capt. Raymond Creekmore of AIR FORCE staff made these sketches depicting the life our men lead on Labrador, Baffinland and Greenland. He returned with an appreciation of their problems and the valuable work they are doing under most challenging conditions. ☆

This is the williwaw, Eskimo for "high wind blowing snow." The squall hit 55 miles an hour velocity (winds sometimes reach more than 125 mph) and whipped temperature down to 31 below. The williwaw had blown out after 48 hours.

At another time and place these GI Izaak Waltons might be lazing on a creek bank of a warm spring day, yanking perch to be fried for supper.

Armed like Pilgrims going to church, these officers and men of the Army Air Forces in Greenland are always mindful of the enemy and go prepared to protect their base from air or sea-borne invaders. In this snow-blanketed, wind-whipped land the principal diversion is the post theatre which takes on a Klondike aspect with the big coats, heavy boots and abundance of shooting irons. Pop corn sold at the PX across the street.

This combat crew was holding a bull session before take-off hour at an AAF airbase somewhere in Labrador.

This night scene in Labrador was sketched while some Flying Fortresses were tuning up for their long hop across the North Atlantic to England or Scotland. Revving motors swirl up high clouds of dry snow which are illuminated by the lights of other planes. Ground crews do a topnotch job despite these conditions.

WHEELS OF THE AAF

By Lieut. Col. William B. Droge

Chief, Vehicles and Powered Ground Equipment Branch, Air Service Command

More than 400 B-17s of the 8th Air Force have been made to fly again by motorized repair shops. The first of these MRUs (mobile repair units) took to the field in 1943, equipped with repair trailer accompanied by a 2½-ton truck and, naturally, a jeep.

An RAF officer stood talking with an American colonel on the hard runway apron which webbed out over the big AAF Service Command depot area somewhere in mid-Africa. The Britisher's eyes moved rapidly across the field, first toward a huge crane that was hoisting a wounded P-40 fighter onto the scrap heap, then to a big six-wheeled tanker truck moving in to feed a thirsty Liberator. He was amazed at the operation. This was his first glimpse of American motorized ground units.

"You chaps have a regular traveling circus," he told the colonel. "By George, you have a pair of wheels for everything."

That is not an understatement. Today the Army Air Forces operating at home and abroad have thousands of specialized vehicles, each designed for a special job pertaining to the servicing or maintenance of our fighting planes. In all, there are more than 300,000 motorized units in operation and a like number on order in factories or en route to airbases. Of equal importance is the fact that hundreds of thousands of trained personnel are operating these mobile units on all battlefronts and home fields.

Charged with the responsibility of seeing that these vehicles and their operators are made available to our AAF units overseas and in the continental U. S. is the Air Service Command.

The command has hauled giant tankers, truck-tractors, bulldozers, ambulances and other such equipment to airfields in the jungles of New Guinea, the desert of Africa, the shell-torn fields of Sicily and the almost inaccessible landing strips on the Gilbert Islands.

By ship and by plane our AAF units are supplied with motorized equipment that is the best in the world, the product of the American automotive industry which before the war made eighty percent of the world's motor vehicles.

In China recently ground crews and airmen were startled when they saw 2½-ton cargo trucks roll out of the big doors of cargo planes that had just landed. Immediately the trucks were put to use hauling hundreds of pounds of supplies to the field. The motorized supply operation is a continuous cycle. The ground motorized units keep the airplanes in the air, and often the airplanes bring in the fuels and parts that keep the ground units operating.

These ground units have saved the day on many occasions. In North Africa, for instance, when the advances and withdrawals were quite frequent, when small forces fought each other for mere spots of

From cover this refueling truck services the more active vehicles in an airbase area in India. Here a weapons carrier takes on gasoline.

This land freighter is a 4-5 ton tractor attached to a low-bed trailer. The machine is called a tractor because it is a prime source of power.

ground that helped to decide the final victory, there was one case when a 2½-ton cargo truck saved thousands of pounds of AAF bombs and ammunition. The "ammo," on flat cars, had just been moved in, and the locomotive had chugged off to another job. Suddenly the enemy was reinforced, and it became necessary for our forces to withdraw. Our men didn't want to destroy the ammunition because it was too hard to get. Nor did they want the enemy to get it. Some quick-witted sergeant solved the problem: He put the cargo truck on the tracks and pushed the flat cars out of the danger zone, thus saving their precious contents for use later in blasting the enemy out of its position.

In the Southwest Pacific theatre our forces had established a landing strip on one of the small islands, but the Japs kept away our supply boats and our forces had all they could do to cut their strip out of the jungle so planes could fly in. When the planes did come, float drums of gasoline had to be floated ashore at night on the other end of the island and men had to carry them several miles through the jungle. That is, they did until motorized vehicles were brought in to cut a roadway and haul the fuel to our planes.

The colonel in command of the expedition said that his men were so glad to get the motorized units that one sergeant waved his .45 and shouted to the group: "Shoot anyone that doesn't treat these trucks like he would the Old Man's car."

"And," the colonel added, "I believe he would have done it."

That's how important the motorized ground equipment is to the men who are utilizing it on our fighting fronts. They keep the ships ready for offensive thrusts or for defensive action because they have ground vehicles with which to do the job. In a sense, these ground-bound trucks, trailers, tractors and all the others are the life lines of the Army Air Forces. Consider that for every B-17 or B-24 approximately seven ground vehicles are necessary to keep the big ship serviced and in the air. For every medium bomber there must be five. Every pursuit ship needs at least four. Such is the magnitude of the job of keeping ground units mobile.

Most of the vehicles which are peculiar to the AAF, such as crash trucks, mobile work shops, fuel and oil servicing trucks are designed and developed by the engineers of the Materiel Command at Wright Field. When they approve new equipment for specific jobs, the ASC distributes it.

Seven ground vehicles are needed to keep one heavy bomber serviced and in the air. The Air Service Command has more than 300,000 motorized units at home airfields and in the battle areas; thousands more are on the way.

Perhaps the most common of all the AAF motorized units is the tug, which looks somewhat like a farm tractor minus treads and takes over the job of moving the airplane between hangar and flying field. The name "tug" comes natural since this vehicle does a similar job to that of the small tugboats when they move the big liners to and fro in a harbor. Special tow roads have been developed which allow great maneuverability for the tug in pulling airplanes around the field.

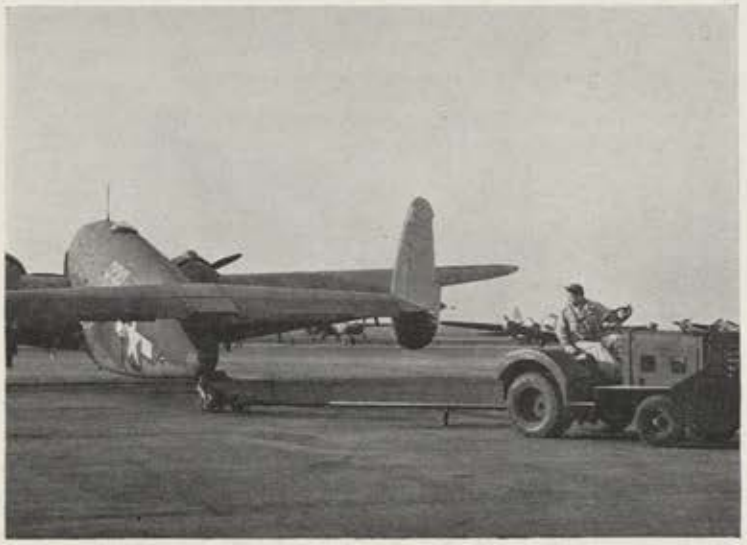
A larger version of the tug is the cletrac which is essentially the nursemaid for the cargo plane or the bomber. It is a combination of machine and service station for it has an energizer which can be used in starting the plane's engines. It is also equipped with air compressors which will inflate tires.

In the Southwest Pacific this air compressor was used to put compressed air into the torpedoes which our planes used against the Jap armada in the Bismarck Sea victory. Primarily, however, the cletrac serves to start planes, run blowers to clean the ship's engines and do other jobs which require power on the ground. In effect, it is "ground power" for the bomber or transport, which obviates the need to run the plane's engines.

CLETRACS were indispensable in the African desert. These power units started airplane engines when dust had nearly ruined their individual starter mechanisms. They also proved easier to operate than tugs in the soft sands when planes were forced down. Frequently they made their way over dunes and hills to haul distressed planes back to their bases. In Sicily cletracs equipped with scrapers helped ASC personnel to clear Axis-shelled runways so our transports and bombers could land with a greater degree of safety. They proved ideal for the job.

Criss-crossing this country and many overseas areas are the AAF's own truck-trailers. These units haul aircraft engines and wing assemblies. Sometimes they take airplanes or gliders to factories for final assembly, or to airfields for assignment to personnel squadrons. The truck-trailer combination is a five-ton affair. The long flat-car trailers are designed to hold complete airplane fuselages or wing sections, and, together, flat-car and tractor are probably the biggest motorized units used by the AAF today, with the exception of the wreckers. An unusual feature about the truck-trailers is that these units are so designed that a trailer can carry two of its own tractors — an astounding test of weight carrying capacity, but highly useful

The tug is similar to a farm tractor and performs a work comparable to that of harbor tugboats. It tows airplanes between hangar and field.



The AAF C-2 wrecker is used for salvage operations, and wherever the usual operational mishaps occur the tractor-crane is on the scene.

in solving transportation problems. The tough, rugged fuel trucks of the AAF are the biggest, most efficient in the world. There is, for example, the big 4,000-gallon capacity F-2 fuel servicing truck, a truck-trailer combination. This unit can service as many as four airplanes at once. It is equipped with four hose reels, two in the rear compartment and two in side compartments, each with a fifty-foot hose, and two gasoline-driven fuel pumps.

OUR most common in-use fuel truck is the F-2. With a commercial four-wheel drive, it is a 2½-ton unit with a 131-inch wheel base powered by a six-cylinder, ninety-horsepower engine. It has eight speeds, six forward and two reverse. The cab of the tractor unit is set directly over the engine, increasing maneuverability and vision for the driver. Overall length of the truck and trailer is 35 feet and the weight of the combination loaded is 20,000 pounds. The tractor-trailer will speed as fast as 45 miles per hour on the highway, or it can negotiate nearly any road or trail in ordinary open country.

In addition to the gasoline tanker there is also an oil truck, the L-1, which was designed because of the inconvenience and delay resulting from servicing both oil and gasoline from the same unit, which previously was the practice. An interesting feature of the L-1's design—brought about because of long-haul supply problems—is that the chassis of the L-1 is interchangeable in whole or in part with that of the big F-2 fuel truck. The oil tank of the L-1 has a capacity of 660 gallons of lubricating oil, housed in three compartments, the center one of 100-gallon capacity being insulated and having electric immersion heaters which keep the temperature at 110 degrees by thermostatic control regardless of outside temperatures. Power is obtained either from outside sources or from 2500-watt generator plant installed in the truck. In addition to heating the tank, the plant may also be used for operation of electric hand-tools and other equipment.

Besides fuel, our bombers and fighters need striking power and that means bombs and bullets. To get bombs into the bellies of our heavies or hook them to the wings of our fighters, it was necessary to design motorized vehicles for the job. Thus did the small bomb trucks and trailers come into being—the M-5 bomb trailer and M-6 bomb servicing truck.

The M-5 bomb trailer is a flat, tricycle-geared, four-wheel affair. Its description may sound confusing but its two forward wheels are mounted side-by-side to give the whole unit a tricycle effect. This piece of equipment, though small, is well built and sturdy. It will hold at one time four 2,000-pound bombs, or two 4,000-pounders. There also is a small lift truck on which individual bombs are placed for loading. It is a three-wheeled unit, which is without its own motive power. The bombs move from truck to lift-truck to bomb bay. The M-6 has its own power unit and hoist for lifting the heavy bombs into their nest racks.

Another vehicle common to most airfields is the AAF C-2 wrecker, a giant six-wheeled tractor-crane combination. As its name implies the wrecker is used for AAF salvage operations. When planes are forced to make wheels-up landings, or when they get almost home and crash, or when the usual operational mishaps occur, the C-2 wrecker is on the job. Its crane picks them up, puts them on a trailer, and the wrecker takes them home for repairs.

Similarly used, except for larger planes, is a thirty-ton bomber crane. It is a four-wheeled unit with dual tires on the rear axis. The rear tires are six feet in diameter and three feet wide and front tires, eight feet in diameter. Its long boom that serves as a hoist extends almost thirty feet into the air. A Diesel engine which weighs more than a ton furnishes the power and operates the crane which can pick up a B-24 as easily as it can a P-38.

WHEREVER our planes fly it is necessary that they have repair shops for their instruments and other small auxiliary parts. For this purpose the AAF has designed a portable instrument repair unit. It is a machine shop on wheels. Outwardly it looks like a large moving van or a trailer on a freight truck line. Inside it has a lathe, polisher, grindstone, drill and other machines necessary to the maintenance of aircraft parts and instruments. Many of these mobile mechanics' homes in the fighting zones have been responsible for keeping our planes in the air when they otherwise would have been grounded.

In listing the many items of motorized equipment used by the AAF the ordinary field service truck must be mentioned. It is a troop carrier, a mobile mess kitchen, a dump truck or a cargo carrier. In addition, there are the special Army buses designed for transporting workers to and from the continental airfields, the small pilot wagons and modified jeeps which transport plane crews to the operations offices. These have come in especially handy in foreign fields where the distance to the headquarters from the runway is sometimes more than three miles.

Although it doesn't have its own motor and, therefore, cannot qualify as a motorized unit, the bicycle also is playing an important part in the AAF ground-motivation program. It, too, has been redesigned. The AAF has introduced a folding bike which fits inside a common cargo plane. Latest reports show that almost every transport going overseas is equipped with one or more of them. ☆

A larger version of the tug is the Cletrac, nursemaid for cargo and bomber planes. It is equipped with air compressors.

HERE'S WHERE YOUR MAIL GETS ACTION

"I HAVEN'T received my allotment check," writes the mother of an AAF enlisted man overseas.

"Three months ago my wife entered the hospital and I haven't heard from her since," writes a sergeant in India.

"Our boy was lost in Italy. How can we obtain his personal effects?" ask a pilot's parents.

"I'm sure my boy is overseas. What is his APO number?"

"My husband is missing."

"Where can I get a job?"

"No letters have come from my son in three months. Where is he?"

Every day scores of dispatches like these from AAF men overseas and the families they left behind are received at a Washington office known as the Personal Affairs Division, Headquarters, AAF, where a small group of volunteers—all of them wives of AAF officers—give personal attention to inquiries involving allotments, maternity cases, employment and a dozen other problems. This section, which until recently was the Headquarters Section, Air Forces Branch of Army Emergency Relief, has handled 7,000 cases within the past year.

Men stationed from Iceland to the Fijis who may wonder exactly what happens when they write merely to "Headquarters, Army Air Forces" concerning matters purely personal are assured that no matter what the inquiry, it gets prompt and individual attention from one of 75 AAF women volunteers assisting Mrs. H. H. Arnold in the overseas section of Personal Affairs Division many hours each week.

When the letters arrive at this section, they are recorded and numbered. The executive secretary consults Mrs. Arnold concerning the necessary action for each. Volunteers note suggestions regarding the answer or action to be taken as a result of each letter and give each case personal attention until it is finished. When the answers are prepared they are returned to Mrs. Arnold's desk for final checking and signature, and so into the mails.

Problems of family allowances are referred to the Office of Dependency Benefits, and if help is needed by the applicants in assembling any necessary papers they are assisted by volunteer members of this section.

If a new baby is expected and the soldier's wife, aware that she will need help with doctor and hospital bills, writes to the Personal Affairs Division, she is told of the emergency maternity and infant care for families of enlisted men in the armed forces. This program is being carried on in most sections of the country by State Health Departments, and the mother-to-be is given the name and address of the director of maternal and child health in her state who will furnish upon request application blanks for this free care. Layettes made by volunteer workers are provided when needed.

INFORMATION is obtained from the Adjutant General's office to answer queries of "where is my soldier son or husband?" Each letter of this kind is answered immediately, emphasizing the fact that no news is generally good news and that the absence of letters usually means the soldier is being transferred. The anxious wife or parent is told that the correct address will be sent as soon as it can be found. It is usually not long before a "thank you" note arrives informing the office that letters are again coming from the soldier.

Families at home often worry because Insurance Certificates are slow in coming and are grateful for information obtained for them from the Veterans Administration. Many write also to learn when their War Bonds will be received.

Many women wanting to contribute their share in the war effort on the home front have been placed in jobs in defense industries through the placement branch of the Personal Affairs Division.

In some instances families who were self-supporting and needed no help from soldier sons when they left for duty outside the United States, have later encountered acute financial need through illness or the death of a parent. When such conditions arise which entitle them to receive family allowances under the Servicemen's Dependents Act, application forms are sent to them to be filled out and forwarded to the Office of Dependency Benefits.

The personal effects of a soldier lost in battle are most desired by his family. If they are not received, the family is told to write to The Quartermaster, Army Effects Bureau, Kansas City Quartermaster Depot, Kansas City, Mo.

A family writing to inquire where it can learn more details in connection with the death of a husband or son is instructed to write to the Chaplain of his unit.

Whatever the nature of the problem, AAF personnel overseas can know that these officers' wives in Washington—many of whom themselves have been left behind—are working daily to relieve the many worries that beset a soldier or his family in time of war. ☆

Location and file number of cases handled by women volunteers for overseas personnel and their families are displayed on a wall map, being kept up to date by Mrs. O. W. Picher, Mrs. H. W. Grant and Mrs. W. C. Sweeney.

WHAT'S WRONG WITH THIS PICTURE?

THE necessary equipment to install a cell properly is conspicuously absent in this month's picture. Installation is comparatively simple when done the right way, yet these mechs show some relation to circus jugglers.

Installation charts make the procedure easier and they're yours for the asking from unit FASC5-8E2, Fairfield Air Service Command, Ohio. Charts now ready are: B-24 main, CO1-5E-1; B-24 auxiliary, CO1-5E-2; P-39, CO1-11-F-1; B-17 main, CO1-20E-1; B-17 auxiliary, CO1-20E-2, and B-25A and B, CO1-60G-1. Others will be available soon.

To lend a hand to promote rubber conservation and combat mishandling of fuel cells this picture was posed by (left to right) Pfc. Urban Weber, Sgt. Robert Wilson, Pfc. Victor Bender and Sgt. Carl Elmore of the 478th Air Base Squadron, Patterson Field. Eight boners in the photograph are listed on Page 64. Do you find any more?

ON THE LINE

A MONTHLY MAINTENANCE ROUNDUP PREPARED IN COLLABORATION WITH THE AIR SERVICE COMMAND AND THE TECHNICAL INSPECTION DIVISION, OFFICE OF THE AIR INSPECTOR

Spot Light on Fuel Cells . . .

Constantly harping about the critical rubber shortage may become a little tiresome, but like the war itself, something, everything has to be done to lick it.

The big headache in the rubber conservation program is fuel cells. Efforts of rubber experts are of little consequence if men ON THE LINE continue to mishandle cells. See 03-10J series TOs.

Fuel cell failures, past and present, are caused largely by faulty and careless methods of installation and removal. The worst pitfall is on a collapsible type, where improper manipulation in common practice beats hell out of the cell.

Here are some suggestions on this problem:

Cells Require Proper Inspection—When inspecting molded type self-sealing fuel cells used in B-25s and P-38s irregularities on interior are often mistaken as cracks or splits. Thus, cells are needlessly returned to the depot as faulty. Proper inspection then reveals this pleated appearance to be merely sharp folds and crevices which are a result of manufacturing method and construction.

If cracks or splits are genuine and gasoline penetrates into sealant layers, the cells are unfit and must be repaired or scrapped. Inspection must be accurate.

On Tightening Fuel Cell Bolts—Beware of bolting down access door of a fuel cell too tightly; twenty to thirty inch pounds is adequate (see revised TO 03-10J-3). Tighten properly just once. Rechecking is not recommended because synthetic or natural rubber will fool you. Tightened access door bolts after a short period of time will indicate a decrease in inch pounds.

Tank Vent Fittings—Intensive pressure on fuel cells and connections is caused by side-slips, steep banks and dives. Such maneuvers bring about flexing action and may rupture synthetic rubber nipple of tank vent fitting (see TO 03-10J-4) and result in gas fumes filling the cockpit and gasoline splashing on electrical equipment.

TO 01-65B-10 must be complied with! Failure to install new tank vent fittings may cause cell to become inoperative, endanger pilot and plane and cost many hours of labor.

Never Use Knife—The expensive and wasteful practice of cutting cells out of cell cavity with a knife is deplorable. New cells cost $300. Never force cells out, collapse them to avoid damage.

Crate with Care—The correct crating of cells requires that fittings be secured and cell does not sag. Cells should be stored and shipped in original containers if possible. Never stack crated cells so high that the bottom one is under pressure.

Careless handling of uncrated cells administers a terrible beating to them. *Do not stack uncrated cells.* Use individual spaces and place them on the widest surface so they are supported from the interior and don't sag under their own weight.

Fuel cells are harmed greatly by any change from the original shape, whether from warping, bending, twisting or improper collapsing. TO 03-10J-5 tells the whole story.

Mechs Change Old Wing for New Behind the Jap Lines . . .

A "hopelessly damaged" transport plane, stranded on an emergency airfield behind the Jap lines during the recurring pushes from Port Moresby to Buna and Gona and beyond, was put back into the air by ingenious Air Service Command mechanics—and the repair job involved the shipment, by air and under the belly of another transport plane, of a complete new wing which was flown over New Guinea's worst mountains and jungles.

The story begins with an accident which disabled two C-47s at an advanced airstrip deep in the rugged interior of Dutch New Guinea. The field was actually behind the lines of the Japs, who at that time still held the coast positions of Buna and Lae and their forces in the Markham Valley were only fourteen hours away.

To recondition one of the two smashed planes, parts were stripped from the other. The repaired transport took to the air and was flown out. But the other, according to official report, was "damaged beyond repair" in the following sections: left wing, right wing tip, right aileron and right propeller.

Responsible for making a decision on what to do with the hulk was the 5th Air Force Service Command. Its mechanics insisted they could put the C-47 to rights if only necessary parts were brought in.

The problem, however, was to get a complete wing from Port Moresby over the Owen Stanley range and into the little Bena Bena field, more than 5,000 feet high.

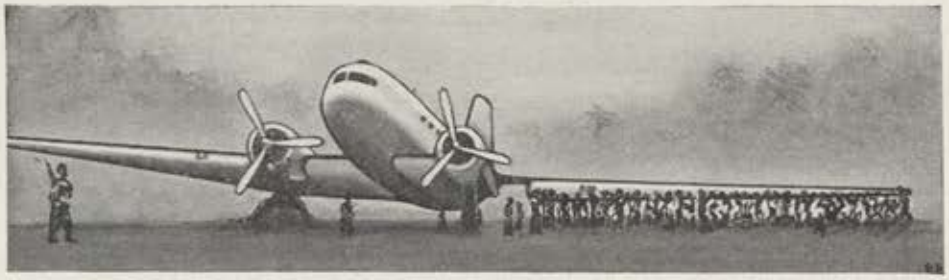
No transport was large enough to stow another transport wing, but the repairmen at Port Moresby improvised an external rig on a C-47 by which the wing was slung under the belly and cabled to the plane's bulkheads. So that the open root of the wing would not set up impossibly high air resistance, it was faired—streamlined—by means of a false framework rounded off with fabric and dope.

A new aileron, wing tip and dis-assembled propeller were loaded inside the transport and the flight to Bena-Bena was made without incident.

But the work of the ASC mechs there had only begun. To install the new prop it was necessary to cut great bundles of jungle grass as a mound to stand on—a wilderness substitute for a crew chief's stand. The next job was to mount the wing without benefit of a wing sling. Manpower made up for lack of equipment. More than 100 natives were drafted into service. Raising the wing on their backs, they walked it into place while mechanics made the junction.

The entire task, which had the effect of adding another precious transport to the none-too-large supply of the then struggling 5th Air Force, was accomplished in four days after the wing and other parts had been flown to the landing strip behind the Jap lines.

Hats off to the mechs, for another job well done. ☆



A periodic 'breather' in New Zealand does wonders in keeping our airmen in the South Pacific keen, alert and ready for combat.

TIME OUT FOR REST

By Maj. James E. Crane

Flight Surgeon, 13th Air Force Rest Area

That "3,000-mile look," a symptom displayed by men in the South Pacific at about the same time they "feel trees moving in on them," is being cured these days at rest homes established in New Zealand by the United States Armed Forces and Headquarters Service Command.

Wherever possible, a flyer completes a tour of duty in the South Pacific area when he obtains a score of ten points. The points are computed by the number of hours flown divided by one hundred, plus the number of missions divided by ten, plus the number of months in the area divided by three.

We have found, however, that it is not advisable for a man to fly continuously until the total is reached. Such a steady strain and grind would result in great loss of physical and mental efficiency. So, in order to aid our men in working toward the two things they want most to do—destroy the enemy and return home—we give them periodic leaves to visit a rest area. Squadrons rotate their duty and each outfit spends nine days in a climate and environment much different than the forward bases. Special Services of the Service Command set up the rest areas, and its personnel now handle all the supply facilities, maintain the rest camps and attend to administrative duties.

To iron out his flying kinks, this airman is enjoying a vacation in New Zealand. He has found a bicycle at a rest home and a girl at a date bureau, and everything is wonderful.

On arrival at the airfield at the start of the rest leave, all personnel check in with the Special Service officer who billets the men and hands out mimeographed sheets containing information of the available local facilities such as restaurants, canteens, dances, theaters and churches.

Enlisted men are issued any uniforms they might need. All men can draw partial payments from the Finance Office. Rules and regulations are kept to a minimum, and everything is made as simple and convenient as possible. The enlisted men usually go to Western Springs, and the officers to Kia Ora or Maungakiakai. No one is compelled to live at any of these places. If a man wishes he can live in a hotel in the center of the city. Some men, after months at a forward base, simply like to stand on the busiest street corner they can find and drink in the sight and sound of the street cars, autos and passing people.

Most of the men, however, prefer the rest homes which are about as interesting a joint service operation as can be found anywhere. These homes were planned by the Army and built by Navy Seabees. Some are operated by Special Services, with the Red Cross running the mess and providing the recreational program. Others are operated wholly by the Red Cross

with the assistance of volunteer New Zealand hostesses in addition to a regular staff furnished by the Army. A flight surgeon lives in each of the homes.

Western Springs has, in addition to the usual recreational facilities, a large swimming pool fed by natural springs, tennis and badminton courts, a huge recreation hall and a fine eighteen-hole golf course just across the street. Although there are acres of grounds around each home and fine views overlooking a harbor, the center of the town is only ten minutes away. A shuttle service between the homes and the town is provided.

Complete informality prevails. Breakfast is served until late in the morning. A man can sit under a tree all day, reading and sleeping, or he can play three sets of tennis before breakfast, eighteen holes of golf before lunch, go horseback riding and swimming in the afternoon, and take in a dinner dance that night. He has no hours to keep and no one checks on his activities. The food at the rest homes is as good and abundant as in any place in the world. Milk is always available. The icebox is open for midnight steaks. As a result, the men gain an average of a pound a day during their stay.

The morning after the first night of leave, the men report to the flight surgeon for a going-over; their temperature is taken and they are tested for malaria.

Later they are interviewed by two flight surgeons and a nurse trained in psychiatry. The interview is made as short as possible. The men are interrogated about their personal history, their flying careers and are given a Form 64 examination for flying. The results of these tests are compared with the findings of the squadron's own flight surgeon who accompanies his men. Usually, the results of the camp's examinations agree with the ideas the squadron flight surgeon had formed concerning the mental and physical condition of the men. Men who need additional rest get it, and others who are ill or need close observation and building up are sent to a general hospital. The number of neuropsychiatric cases is remarkably low.

ABOUT 5,000 men have come into the area on rest orders in the last year. File statistics present the following picture of the "average" AAF flyer, enlisted man or officer: He is 24 years old, unmarried and a high school graduate. He may have attended college a few terms. Six months in grade, he has been away from the United States for eight months, has flown over 600 hours in military aircraft and has had about 120 hours of operational flying from an advanced base. He has been on 21 missions, is in good physical condition although he is tired and in need of rest and recreation. He smokes a good many cigarettes and drinks moderately. He takes atabrine regularly to prevent development of malaria. He has lost close friends and has accepted the fact. He sleeps well and his morale is excellent. If he is tired and suffering from some combat fatigue, he recognizes his own symptoms.

Time on their hands and they like it. Away for a week from bombing missions, mud and mosquitoes, three officers sit happily in the afternoon sun with nice company and slow talk.

The men pay two dollars a day at the rest homes, an amount which actually covers only the cost of the raw food. The meals are cooked American style, and their reputation has spread over the South Pacific. One gunner stood in the middle of the kitchen, inhaled deeply and said, "They'd make a fortune if they could put this smell up in bottles and sell it." Everything possible is provided for the men's comfort, from individual rooms painted in restful shades and gay drapes, to the usual dances, date bureaus, picnics and all the other things for which the men and women in the Red Cross are famous. The people in charge have shown much ingenuity in getting things for the men, even unearthing a doughnut machine which some New Zealander had imported years ago and never used for one reason or another. It operates 24 hours a day now.

All of this adds up and has a great deal to do with the fact that, when the men go into the flight surgeon's office on their last day of leave for a final checkup, they are found to be keen and alert and ready to return to combat. ☆

And then there is the type who likes to move around. These two officers, with a very pleasant companion, have walked to a Maori shrine where they are looking over some native carvings. Others on leave go in for tennis, golf, beer drinking, sleeping or just admiring civilization.

A Report on Army Air Forces Training Devices

The Shadowgraph for Recognition Training

THE Shadowgraph is a device to project on a screen the shadow of an aircraft plastic model held at any angle which the instructor desires. The shadow thrown by a model on a flat surface gives a more realistic representation of the aircraft in flight than the model itself.

Among the Shadowgraph's principal advantages are simplicity of construction, realism of aircraft images, ease with which views of aircraft may be changed or contrast made between types, number of students who can view screen at same time and unlimited variety of views it affords for tests.

The screen of the Shadowgraph, which may be made from an old sheet or table cloth, should be hung much like a movie screen or stretched tightly across a frame. Preferably a rod should be attached to the top and bottom to keep it taut. A large screen is necessary in order to hide the instructor from the class and thus permit him to manipulate and change models without "giving away" the next one to the class.

Standard AAF aircraft models, scale 1:72 are used. These models may be kept on a table behind the sheet. A stand or a piece of stout wire is necessary to hold the model for projection. A number of devices may be used as the source for light. The SVE projector supplied in the AAF Recognition Kit will work well. An opaque projector or a "tin-can spotlight" may be used. An old automobile headlight with the lens removed will serve if it is placed inside a black box with about a three-inch hole cut in front for the source of light. Regardless of the light source, the distance of the light behind the screen will alter the diameter of the circle of light thrown on the screen. This distance should be adjusted to give approximately a three-foot circle of light.

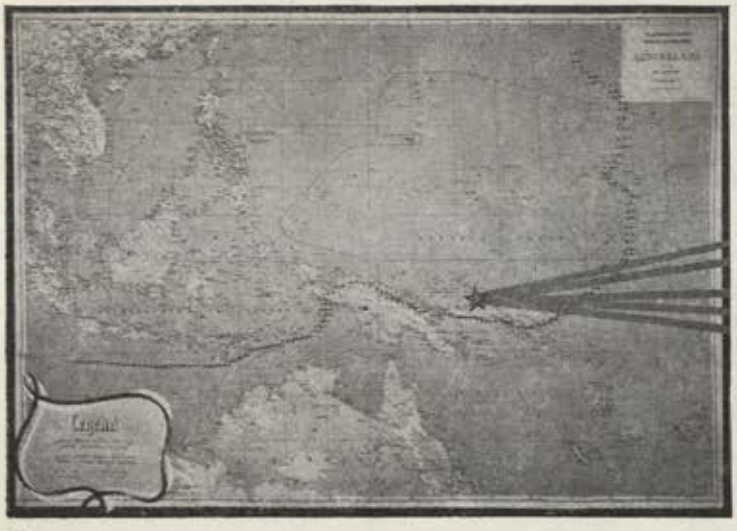
The room need not be completely darkened. When the model is held between the light and the screen, the aircraft's shadow or silhouette thrown on the screen is visible from the opposite side. There will be some distortion of the shadow if the model is not held fairly centrally in the patch of light on the screen. A compromise will have to be made between holding the models too close to the screen, which produces a sharp image but considerable perspective distortion, and having them too close to the light, which cuts down on distortion but creates a fuzzy image.

Great care must be taken to explain to students the exact position of flight. From their side of the screen they see the airplane as though they were looking at it from the source of light. When the model is facing the light it appears to be approaching the students; if the light shines on the under surface of the model, then

Behind the screen.

Before the screen.

These posters are reproduced from a graphic portfolio prepared by the ASF for first aid instruction. The series consists of fifty pages in color, each illustrating step-by-step first aid procedure in combat. The accompanying poster presentation, appearing on the bulletin board



it appears as if seen from below, and so on.

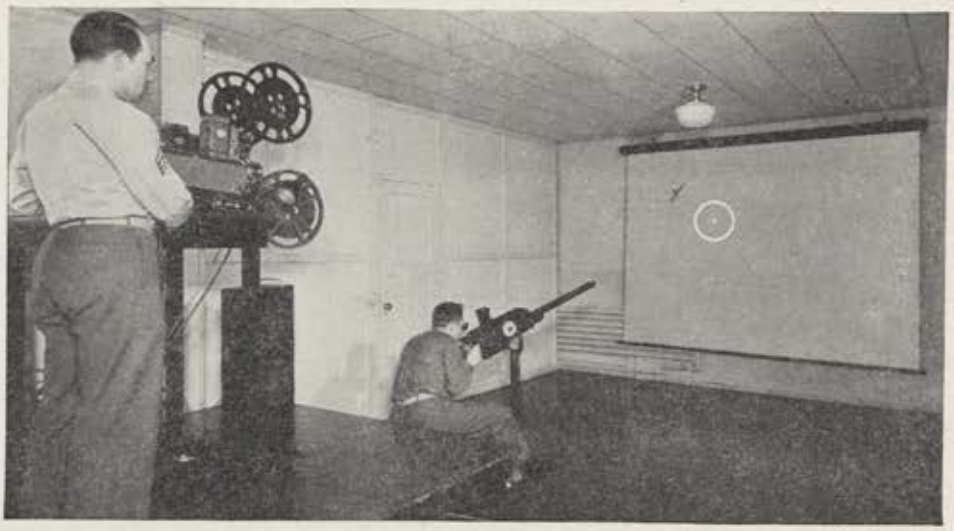
An unlimited variety of tests can be given with the Shadowgraph. For simple tests the aircraft image may be moved slowly across illuminated part of sheet, giving an average of three seconds exposure. This can be speeded up to one second or even less for advanced students. Attempt should be made to simulate correct attitude of flight in the interest of realism.

By varying intensity of light, different luminosity effects may be reproduced. Students should be kept at least six feet from screen and not too near the sides of the room. Combat crew members must be trained to recognize aircraft at any angle for 700 to 1,000 yards range. If a 1:72 scale model is used near the screen in a large classroom, this range is simulated to students sitting from thirty to forty feet from screen. In alert rooms or other convenient places, points equivalent to ranges of 400 to 1,000 yards may be marked on the floor, wall or ceiling.

Gunnery Trainer

THE worst that can happen to a student gunner in the Aerial Gunnery Trainer (E-14, Jam Handy) is that he "gets the gong" instead of hot lead if he misses the attacking enemy plane. This device is designed to teach all phases of aerial flexible gunnery, without any hazard, by allowing student gunners to shoot at motion pictures of attacking aircraft in accurately simulated combat.

The gunner sits behind a mock-up .50 caliber machine gun, or in a mock-up turret, facing a screen upon which are projected motion pictures of attacking aircraft. When an attacking plane appears, the gunner recognizes it, estimates its range and opens fire exactly as he would do in combat. If the target plane is within range, the gunner hears the sound of his own guns; if it is out of range, he hears a loud gong or siren. In addition, the sound of the engine of his own plane is present if desired for realism.



The E-14 Aerial Gunnery Trainer.

Two 16 mm sound movie projectors are used in this device. One throws on the 7 by 9-foot screen the picture of skyscape, groundscape, attacking fighter and a portion of the defending bomber to permit orientation. The other projects a ring sight which shows continuously throughout an attack the correct point of aim.

A reflector sight with a 101 mm diameter is mounted on the gun. A gun light mounted in the barrel of the dummy machine gun shows the student and instructor where the gun is pointed. An automatic timer for amunition is provided.

The gun or turret is placed so that the sight is 10 feet from the screen. This view gives the gunner a coverage of 40 degrees vertical and 52 degrees horizontal. The projectors are 15 feet from the screen mounted on a locally constructed stand to project the pictures over the student's head. Observers or students waiting their turn can be seated beside the projectors.

All films issued for use with this device have been prepared with the utmost care and are based upon exact mathematical calculations. The points of aim for each attack have been computed on the basis of the latest ballistic tables and other approved mathematical data. Films are provided with each trainer. ☆

WHERE TO GO

Information on the availability of training films and film strips, aircraft recognition materials, training devices and training publications may be obtained from the Chief, Training Aids Division, Army Air Forces, 1 Park Avenue, New York 16, N. Y., upon request through channels. AAF Regulation No. 50-19 explains fully the functions of the Training Aids Division.

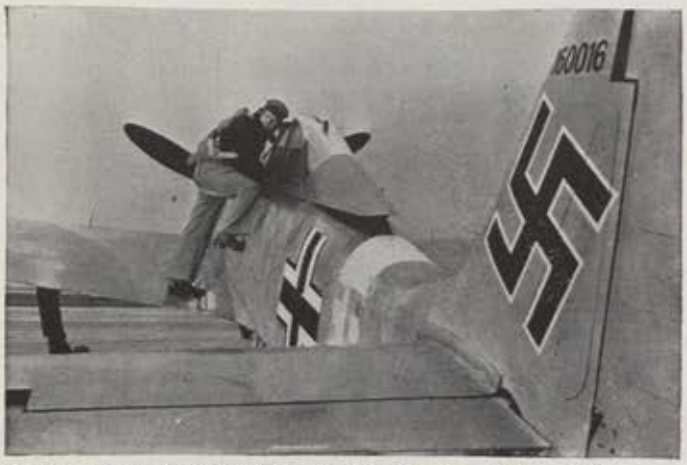
at AFTAD, illustrates a secondary use of the posters—to impress personnel in this country that "this is our war, too." At either end of the display are maps of Europe and the Pacific. The portfolios may be obtained by eligible military units through AGO sub-depots.

AID FROM THE SKIES FOR THE YUGOSLAVS

Since the capture of airfields at Foggia, AAF planes have hopped across the Adriatic Sea in repeated strikes against enemy positions in the Balkans. Some of the most telling blows have been directed at German troop concentrations, transportation centers and harbors along the Dalmatian coast and in the Yugoslav interior. In this photo B-25s are shown peeling off to bomb enemy forces at Travnik which had been taken over by the Nazis as a headquarters for one of their divisions. This 12th Air Force attack aided Yugoslav Partisans in delaying the German advance until Marshal Tito's troops, at nearby Jajce, could withdraw. Heavies and bomb-carrying fighters have joined in the Yugoslav attacks.☆

TECHNIQUE

A Review of Technical Developments in the Army Air Forces



Captured Focke-Wulf 190 fighter-bomber is being put through the paces by Materiel Command. Lieut. Col. Barney Estes (right), chief of fighter branch, inspects the landing gear. Note similarity to P-51 in background.

FLIGHT TESTING
the Focke-Wulf 190

A German FW-190 which was captured during the battle for Naples is now undergoing tests by the Materiel Command at Wright Field, where the aircraft is revealing the traits which have given it prestige over Europe.

Lieut. Col. Barney Estes, chief of the fighter branch of the command, took the plane aloft on its initial flight in the States and had this to say: "It's no wonder the boys flying the ditch have a wholesome respect for the Focke-Wulfs."

This particular plane might be called the counterpart of our P-38s, P-40s and A-36s. It carries two wing tanks, has long range and the standard practice of the Germans is to carry a bomb in a rack beneath its fuselage. Although the range with this gas capacity is not known, the British have found the droppable tanks scattered all over England.

The FW-190 requires no mixture control, and proper fuel to the engine is handled automatically. It does not have the usual hydraulic pressure gauge carried by most American-built planes and, like the B-17, the FW-190 uses an all electrical system for its retractable landing gear, flaps and bomb releases.

The German fighter is powered by a Bavarian Motor Works 14-cylinder, twin-row radial engine rated at 1,750 horsepower. The ship weighs five tons, has a 34½ foot wing span (dwarfs the light ME-109) and is similar in weight and size to the P-47.

Firepower of the FW-190 is limited principally because the weight once used for its defensive action in guns and bullets has been replaced by its light bomb load. It has two 20 mm cannon built into the wing roots, electrically synchronized to fire through the propeller. No data has been released on its speed and altitude. Pilots say it is extremely maneuverable.

— Lieut. Laurence B. Krogh, Materiel Command, Wright Field.

Growth of Aircraft Generators

Seven years ago, the largest generator used by the Army Air Forces was rated 750 watts and the electrical load it supplied consisted of the plane's radio and lighting. Today, generators rated 9,000 watts are in use on our new combat ships and the electrical load they supply has grown to include landing gear retraction motors, automatic pilot equipment, multiple-gun turrets, heated clothing, windshield wipers and many other pieces of equipment.

The development of aircraft generators has not been merely a matter of increasing size to increase electrical output, for the consideration of weight has become more important with each succeeding year. Today's 9,000-watt generator, weighing well under fifty pounds, represents an increase in power of 1,100 percent, yet it is only 25 percent heavier than our generator of seven years ago. This remarkable improvement in the ratio of output to weight has been made possible by a variety of new features.

The materials used in present construction permit the generator to be operated at higher temperature without exceeding the limitation of the insulation used. This permits a higher load to be drawn for the same size and weight machine. Cooling of the generator, which up to a few years ago was accomplished by a fan on the armature, is now provided by an air blast duct supplying cool air at the high pressure due to the

forward motion of the airplane. Again, this permits a higher load current to be drawn from the generator without exceeding the allowable temperature limitations.

An important contribution to generator progress has been the development of improved voltage regulations. The voltage regulator varies the resistance of the generator shunt field circuit automatically, to maintain a constant voltage regardless of changes in load or speed. Earlier voltage regulators of the vibrating contact type could handle field currents up to 1½ amperes. The present regulators, of a new carbon-pile type, can safely handle field currents up to eight or nine amperes. The increase in allowable field current has made possible a considerable reduction in generator weight, since the field coils can now be wound with fewer turns of wire and the magnetic field strength will still be the same.

Larger generators have required a departure from the simple shunt generator construction, and largest machines today contain compensating windings and interpoles, insuring against sparking between the brushes and commutator at any load or speed. This also helps to keep down the temperature within the brushes and commutator and permits a greater load current to be drawn for the same size machine.

A great weight reduction in our larger generators is achieved by the use of higher operating speeds, which reduce the amount of iron and copper needed in the magnetic and electrical circuits.

But the problem has involved more than merely increasing electrical capacity and keeping weight down. Conditions of operation have become ever more severe. Today we talk of long-range flights at 30,000 feet and higher. The effect of high altitude on generator brushes was to produce an abnormally high rate of wear until about a year ago when a successful means of treating carbon brushes to prevent excessive wear at high altitudes was developed by industrial research scientists in collaboration with the AAF Materiel Command at Wright Field. The aircraft engines on which the generators are mounted have become increasingly more powerful and with the higher engine powers has come greatly increased vibration. This has required careful design of the mechanical structure of the generator.

It is unlikely that Germany has a 9,000-watt generator weighing less than fifty pounds since the largest generator yet to be found on a German plane that came within American gunsights was rated 3,000 watts and weighed 38½ pounds. Comparing favorably with this is the AAF Type O-4 generator, also rated 3000 watts, but weighing only 26½ pounds and capable of delivering its rated load over a much wider speed range. The Type O-4 generator is standard equipment on several of our single-engined fighters. — **Lieut. Col. T. B. Holliday, Chief, Electrical Branch, Equipment Laboratory, Materiel Command.**

Jeep Camera-Carrier

A simple means of converting a jeep into a camera equipment carrier has been designed by the United States Army Signal Corps Photographic Center, Astoria, N. Y. This jeep carrier provides a means of transporting camera equipment for field units and serves as a platform on which equipment can be set up and operated.

The equipment necessary to make these facilities consists of two laminated plywood platforms with hooks, clamps and web belts attached. The main platform fits on the rear of a standard jeep behind the front seats and rests on the wheel wells. A smaller platform, mounted on the hood just in front of the dashboard, provides a means for holding one of the tripod legs. Both platforms clamp onto a jeep without the use of tools, and there are no holes drilled nor other alterations made to the vehicle. The complete installation can be attached within a few minutes and web belts with snap catches provide a flexible means of securing equipment cases to the boards. Equipment which may be carried includes the camera cases, magazine cases, standard and baby tripods, batteries, extra film magazines and standard crew field equipment such as bed rolls and rations. — **Col. Roy M. Jones, AAF First Motion Picture Unit, Culver City, Calif.**

This jeep has been converted into a traveling platform for field photography. Space is also provided for carrying camera supplies.

Brake-Bleeder for P-47

A Thunderbolt brake which formerly would have taken thirty minutes to three hours to bleed can now be finished in three minutes or less by a method devised by Master Sgt. Alfred J. Gouba of Shenandoah, Pa., maintenance chief of an 8th Air Force fighter squadron.

The sergeant's idea for such a device was given impetus when a technical order called for the modification of the de-icer systems on the P-47s. He built his machine from one of the discarded pumps. The small motor on the pump is driven by an energizer, an apparatus used to supply current to start airplane engines.

The pump forces the brake fluid from an attached can through a hose into the hydraulic system of the wheel. The old fluid and air bubbles are forced out of the drain in the master brake cylinder in the cockpit. The machines are a marked improvement over the GI brake bleeder, which consists merely of a large drum of fluid. Air pressure in this drum is built up with a tire pump, the pressure sending the fluid into the hydraulic system. The machine solves the problem of providing a more uniform pressure than is possible with the GI outfit and accounts for a marked saving in time during cold weather when the brake fluid is thicker. — **Cpl. Gerald C. Peterson, 8th Air Force Fighter Station, England.**

The World in a Room

A room which will manufacture any kind of weather from Arctic cold to desert sandstorms will soon be in full operation at Materiel Command headquarters, Wright Field. So versatile is this all-weather chamber that Army equipment developed to meet climatic conditions anywhere in the world can be tested there. The chamber will produce temperatures 60 degrees below zero, and 150 degrees above. In between it will reproduce hailstorms, rainstorms, sandstorms, sleet, fog and jungle humidity. It can even be converted into a foot-deep pond for testing life-rafts and water emergency equipment.

Two blowers furnish wind velocity to match that of any habitable area of the earth, and these will be used to enable engineers to study the reaction of equipment when operating under severe wind conditions. Showerheads on the walls permit engineers to create rainstorms with drenching realism, and the temperature, of course, can be accurately regulated. If something stormier is desired the blower is turned up and the room is swept by a full gale. Swirling sandstorms can be made by simply opening a hopper and dumping imported desert sand into the windstream. Heat is provided by several batteries of sun lamps.

Humidity can be created and controlled to any degree, such conditions simulated by means of an electrically heated humidifier and controlled air pressure. Fog can be produced by water spurted through specially made nozzles across the roof of the chamber. Two-way communication allows persons participating in the tests to maintain constant contact with an observer.

Blizzards rage and storm winds blow in the all-weather chamber of the Aero-Medical Laboratory at Materiel Command headquarters. Testing life rafts is one of many uses made of this storm center at Wright Field.

In cases where a subject is forced to remain inactive for long periods in the room, a music recording device is hooked up to provide entertainment.

For converting the chamber into a lagoon, a special rubberized lining has been built for the floor. With this lining in place the room can be flooded with one foot of water for making life-raft and related tests.

Refrigeration machinery for producing Arctic conditions consists of two individual compressors, although one will whip up enough cold for ordinary tests. Both are employed to hit the low of sixty below zero. Defrosting can be accomplished in a matter of minutes.

Elaborate instrument panels will permit operators to use either manual or automatic controls for all apparatus governing the chamber, and complete control within the chamber will be in the hands of an operator at all times. Recording devices will record to one-half percent of absolute accuracy any changes exhibited by the personnel inside, and often such changes will be recorded by the graphs before the person himself is aware of them. **— T. A. Berchtold, Materiel Command, Wright Field.**

The enlisted man with earphones is talking to the man inside chamber and observing his reactions to sub-zero temperatures while operating a machine gun. Thermometer showed forty below zero when picture was made.

Tin Cans and Blackouts

Two tin cans, four discarded bolts, a pair of tin shears and a few daubs of black paint recently were combined to produce a new headlight shade now providing maximum road light for jeeps in Britain's blackouts.

Designed by Maj. Robert H. Savage of Rivera, Calif., ordnance officer at an 8th Air Force Service Command depot, the new gadget takes advantage of the coincidence that a number ten can is the same size as a jeep's headlight opening.

Designed to provide an absolute minimum of road light, when the shade is installed no part of the headlights can be seen head-on, although the driver has good vision for approximately fifty feet. Full use of dimmers is permitted.

An experienced maintenance worker can complete a set of shades in thirty minutes, although Major Savage, working with jigs and fixtures has cut the time to ten minutes. After cutting the can (which is six inches in diameter) to a height of four and a half inches, ordnance workers use a templet to measure off a face opening three inches deep, then cut away the marked-off area. This leaves a full circular strip one and a half inches wide around the bottom of the can.

The second can is reduced to an inch and a half strip which runs its full circumference, and half of the circular bottom is cut out. Holes are then drilled in both sections at points marked by the templet. The smaller section is fitted inside the larger section, hole to hole, and fastened to the headlight opening and to each other with four bolts.

Extreme care is taken in installing the shades so that the top and bottom sections form a horizontal plane, thereby preventing a direct view of the headlights. The shade fronts are then blackened and the jeep is ready for the blackest blackout. **— Public Relations Section, Service Command Depot in England.**

Informal discussions on military tactics spring up at will in the Convalescent Training Program. Arguments are always lively, often heated, as GI strategists hold forth on air power, or when we'll lick Japan. In this case, tanks are under heavy verbal fire at Hondo Army Air Field, Texas.

LEARN WHILE YOU HEAL

(Continued from Page 16)

ing general medical officers, surgical, orthopedic and psychiatric specialists who keep careful tab on the clinical improvement of the men. Equally careful attention is paid to the vocational side of the picture by a trained staff who give instruction in the AAF's synthetic training devices.

These convalescent centers have this objective: To return as many men as possible to their previous AAF assignment, or to some *other* assignment in the Air Forces. Should this be either impossible or impracticable, each center has a staff of qualified specialists who provide transitional vocational instruction, job analyses and general education to enable men to make the best social and economic adjustment possible when they are discharged from military life.

Although the activities are supervised and selected with purpose, there is a welcome absence of regimentation. Facilities for recreation vary, of course, with the locale, but no bets are missed. Sun-bathing, swimming, tennis, golf, softball, good food, comfortable lounges for relaxation and reading make healthy inroads against operational fatigue and help considerably to speed GI convalescence.

Frills, maybe, but there's a method in this morale-building. All the officers associated with the CTP are firm believers in the value of the extra-curricular, usually-overlooked items which they consider of great therapeutic value. "Everybody bothers about the big things," Colonel Rusk says. "As a result, there's not enough attention paid to the little ones. Sometimes they are the things that will speed a patient's recovery just as much as the right kind of medicine."

It's not all play—as patients will emphatically tell you. Whether a soldier is hospitalized for a day or for three months, whether he's in a station hospital or a convalescent center, he's constructively working and learning day after day in almost every spare minute of his waking hours.

Convalescent education as developed and practiced by the AAF has already proved to be one of the soundest adult education ventures to come out of the war. Its scope is limitless. The subject range is as broad as the AAF itself, and the instruction can be adapted to any sized group or any educational level.

Special classes designed to teach self-protection are given to men in basic training centers. The CTP slogan to these men is: "While you're flat on your back today you may learn something that may save your life at some future date." Gas warfare, camouflage, map reading, Judo and first-aid are high on the list of "musts." Classes in booby traps are popular—and to the point.

In sunrooms filled with odors of paint and glue, half a dozen men in familiar grey pajamas and red robes may be building model planes while another paint-dobbed group may be learning techniques of camouflage. Patients able to walk to auditoriums and lecture rooms get training films, geopolitical movies, lectures on weather, decontamination, land mines, Arctic and jungle medicine, tips on the care of teeth in the tropics, what to do for sunburned lips and a host of other subjects that may not be stressed in other types of training.

But if the patients can't go to the program, the program is brought to the patients. It's as simple as that. In one ward a 16 mm movie may be on the screen; in another, men propped up in bed may be learning to make camouflage nets by tying special knots in pieces of string, or listening to a current events lecture or daily

While recuperating today, patients may learn something that may save their lives later. Lessons on tropical medicine, booby traps, gas protection are high on the list of CTP "musts."

news summary in still another ward, or watching a group of wandering patient-troubadours in action, or learning 150 key words of a foreign language from phonograph records or brushing up on math and physics.

Where weather permits, classes are also held out of doors, and it's not an uncommon sight to see a group of students studying aircraft recognition beneath palm trees on a strip of Florida sand, in a sun-drenched patio on a California desert or beside a cool lake in New England. Citizens of Miami Beach presented the hospital there with a number of small boats and instructors have made the most of this "convalescent fleet" and nearby lagoons to teach patients life-saving aquatics, how to handle themselves in shark-infested or oil-covered waters, or how to swim away from a shipwreck.

Since the advent of the CTP, hospital libraries have reported a 100 percent increase in the demand for technical books. Hospitals serving technical schools give patients a chance to keep up with their technical skills. Men lose their code speed, it is found, after a week without practice. To enable students upon discharge from the hospital to take up where they left off in their classes, special code receiving sets and sending keys have been placed by the patient's bedside. For at least thirty minutes each day, wards are blacked out and code is received from special blinker sets—simple but practical mechanisms made from ice cream cartons. Gadgets abound in the CTP and help to sugar-coat the teaching.

Keynote of the instruction is its informality. If the alert CTP officer finds he has among his patients a chemical warfare expert or a former political science professor, chances are that he will quickly organize classes in these subjects and ask these patients to conduct them. Seventy-five percent of the instructors are convalescent patients, either men who have seen foreign service or specialists in civilian or military subjects. It's good therapy for the teacher and a tremendous morale factor to the student-patients.

Each hour a patient spends taking necessary physical and mental instruction is a valuable man-hour saved. Multiply that by the number of hospitals throughout the AAF and the number of patients in each and you get a general idea of the part the CTP is playing.

On discharge from the hospital, each man who has received at least ten hours of instruction takes back to the commanding officer of his unit a certificate of his work under CTP, and it becomes part of his service record.

"The program has had a tremendous soldier reception," General Grant says. "Convalescents once did nothing but lie in bed bored stiff. Now the almost universal reaction is, 'Why didn't somebody do this before?' " ☆

What's Your AIR FORCE I. Q.?

1. The distance from Attu to Tokyo is approximately
a. 500 miles *c. 3,500 miles*
b. 2,000 miles *d. 950 miles*

2. You are most likely to find an isobar
a. Wherever liquor is sold
b. On the dashboard of a B-24
c. In Iceland
d. On a weather map

3. The Aegean Sea is located between
a. Sardinia and Italy
b. Greece and Turkey
c. Norway and England
d. New Guinea and Australia

4. The C-87 is a transport version of the
a. B-24 *c. B-18*
b. B-17 *d. B-19*

5. The Jap aircraft popularly referred to as Oscar is a
a. Single engine fighter
b. Twin engine bomber
c. Twin engine fighter
d. Four engine bomber

6. The commanding general of the 10th Air Force is
a. Maj. Gen. Howard Davidson
b. Maj. Gen. Claire Chennault
c. Maj. Gen. George E. Stratemeyer
d. Maj. Gen. Nathan Twining

7. If you are flying at 300 mph indicated at 20,000 feet, your true air speed is between
a. 300 and 315 mph
b. 325 and 350 mph
c. 400 and 415 mph
d. 385 and 400 mph

8. Truax Field is located nearest to
a. Baton Rouge, La.
b. Fort Worth, Texas
c. Madison, Wis.
d. Stockton, Calif.

9. The island of Truk is located
a. South of New Guinea
b. North of New Ireland
c. West of the Philippines
d. East of the Gilbert Islands

10. The hygrometer is used to
a. Determine wind drift
b. Measure the degree of moisture in the atmosphere
c. Determine the temperature of the air around the engine
d. Indicate the oil pressure in the lubricating system

11. From January 1, 1939, until November 30, 1943, the AAF trained approximately how many pilots
a. 100,000 *c. 25,000*
b. 50,000 *d. 150,000*

12. The Seafire is
a. The American version of the Spitfire
b. A weapon devised for antisubmarine activity
c. The British carrier-based version of the Spitfire
d. An American naval reconnaissance plane

13. Which of the following colors are found on the Distinguished Service Cross Ribbon?
a. Yellow *c. Red*
b. White *d. Blue*

14. The International radio code indicating an air raid is in progress is
a. QQZ *c. QQX*
b. QQW *d. QQQ*

15. Whiskey is a recommended treatment for snakebite.
a. True *b. False*

16. The MIG-3 is a
a. German tank
b. Navy scout-bomber
c. Designation for an anti-personnel bomb
d. Soviet fighter plane

17. Which word is out of place in the following group?
a. Wewak *c. Madang*
b. Gasmata *d. Buna*

18. Mustard gas has an odor resembling
a. Mustard *c. Geraniums*
b. Garlic *d. Hay*

19-20. Identify these planes:

Answers on Page 64

WATER FIRE

ON Guadalcanal they are shooting down Zeros with a water gun. Airmen who have just arrived in the combat zone, or those who have been flying on strikes over enemy targets for months, are introduced to the gunnery contraptions which you see on these pages, and given a minimum of fifteen hours practice in smacking a Zero model in the eyes with a stream of water which is forced through a turret nozzle by means of compressed air.

The device was contrived by Col. Marion D. Unruh, Commanding Officer of a Bomb Group, who got the idea for the trainer while watching a unit of men experiment with model planes used for target practice in Hawaii. At present, the Guadalcanal Gunnery School offers Belly Turret, Nose Turret, and Top Turret courses, with a Master's Degree *cum laude* for the combination curriculum.

The scenes presented here were taken by an AAF Combat Camera Unit. ☆

Salvaged from a wrecked B-24 and fitted snugly into a nest which has been dug for it, this turret has a nozzle assembly in place of .50 caliber machine guns. Aside from spitting water, however, the operator could just as well be handling a back turret on a Liberator.

As the "Zero" streaks by at a speed which has been compared with that of an actual enemy fighter plane travelling 300 mph, its erratic course simulates the conditions this gunner will encounter when he battles a Nikajima 01 — at which time the ammunition will not be "wet."

This "battle" shot shows the left wing of the attacking plane in the process of being thoroughly demolished by the stream of "bullets." An air compressor at the foot of the gunner's turret forces pressure through a hose from a salvaged water tank behind the compressor. The stream is thereby forced from the tank into the nozzle on the turret and then released when the practicing gunner presses the regulation machine gun firing button.

After Colonel Unruh had perfected the operation of the top turret assembly, he installed a nose turret which may be seen on the platform in the background.

When in operation this model Jap aircraft resembles the airplane ride concession at Coney Island—without music and bagels. The plane, suspended from a motor-driven cam, is controlled to revolve up and down in a complete circle.

The newest addition to the Gunnery School is the belly turret which is being hoisted to the top of a tall scaffold which was designed to provide the belly gunner with the firing angle he will ordinarily encounter in actual aerial combat.

Colonel Unruh discusses with Lieutenant Musick the next water-spouting device to be added to the curriculum, a flexible gun mount for the training of waist gunners. Mastery of all four techniques should lead to a Ph. D. in gunnery.

Mistakes in 'On The Line' Picture on Page 50

1. That can of sealing paste on the floor has no business around here. Never use it on rubber surface fittings; it deteriorates rubber and is a bad hangover from the time when metal tanks were used. You get better seal without it and can disassemble hose without breaking it. Reference: TO 03-10J-3.

2. You'll never light the way to victory, friend, with that unprotected lamp. Correct for this job is a *vapor proof protected lamp*. An unprotected lamp is a grave fire hazard and is taboo here according to AAF Reg. 85-6.

3. Also, lamplighter, the screwdriver in your pocket is an ill omen around cells. DON'T USE IT. The tendency of mechs to give cells an extra shove (at no extra cost, of course) with the handy screwdriver causes punctures and needless damage. See TO 03-10J-6.

4. Getting down to brass tacks, or more specifically, two-by-fours, this is no way to install a fuel cell! The right way is to use wedge paddles and pry lightly. See TO 03-10I-5. Fuel cells must never be jabbed with sharp instruments and whipping around with a two-by-four can break the innerliner. Reference: TO 03-10J-7.

5. Apart from their separate boners these men are performing a whopper in unison. Three or preferably four men should install a fuel cell in a B-25; two or three men hold it up, another anchors it. Installation procedure is outlined in the B-25 handbook, TO 01-60GB-2. Also missing are guide chains or wires to gauge and facilitate installation of hangar supports.

6. Mighty smooth leather jacket you're wearing, bud. It won't stay that way long, though, if you wear it while working around an airplane. The mech in the center (looking reverently at the cell) is just about to poke his two-by-four against the skin of the ship, thus bending the skin, shearing rivets and causing possible structural failure.

7. And that jack in the back looks like another boner about to take place. Are you men going to place the jack under the prop hub? That's wrong. TO 01-60GB-2 calls for use of a sling. This support is necessary because if a strut springs a leak and collapses, the airplane settles down to the bottom of the strut thereby twisting a wing out of shape so that the stress plate cannot be installed. The stress plate represents strength of a wing and must be installed correctly.

8. Brother, get those GI shoes off the stress plate. You'll bend it out of shape. Incidentally, never leave a stress plate on the ground. It belongs on the parts truck until after cell is installed.

CROSS COUNTRY

(Continued from Page 5)

pectation of spending the war-and-six on a Chinese garbage detail, the operator told what had happened and expressed his regret at creating such a furore over the arrival of two lieutenants and twelve enlisted men. The general listened, then laughed.

"Funniest thing that has happened in China," he said.

Song Book

A rather large number of inquiries has reached us about the new AAF song book, "Air Forces Airs," particularly from those in the service who wish to purchase copies of the book. We have been told that Post Exchanges can now order the official song book on Catalog Price Agreement Sheet F340. Special Services officers who wish to make the book available to their units may secure them through this source.

Author DeLonge

Lieut. Col. Merrill E. DeLonge, whose article "Camouflage with Horse Sense" appears on Page 41 of this issue, is the author of the book "Modern Airfield—Planning and Concealment" published recently by Pitman Publishing Company.

Well-Named

A B-24 piloted by Lieut. Herman C. Boles was flying over Europe with a full bomb load when ice, forming at the high altitude, froze control elements and put the ship into a dizzy spin. Frantic efforts to right the plunging bomber had no effect. The air speed indicator hit 350 mph and Boles ordered his crew to bail out, but they were being tossed about so violently during the 5,000-foot dive that this was impossible.

It was a fortunate thing since Boles finally brought the B-24 out of the spin with crew and bomb load intact. Thus separated from his formation, Boles found another and joined up with it to bomb the target. After the crew members returned to base and told their story, they were congratulated. It was the first time the base had ever heard of men taking such a spin on a loaded bomber and living to tell it. The name of the ship is Heaven Can Wait—and heaven did.

"Roger who?"

—FRITZ WILKINSON

Officer and Gentleman

The New Zealanders operate the airways communications in their country, and we assign a liaison officer to expedite our affairs. Late one week, this individual reached his office to find the higher ranking Allied officers in an indignant state. Some, in fact, were in a dudgeon. The cause of their distress was a message which had just come in from a Marine colonel who was enroute. The message read: "Contact best sporting house to stay open until arrive Star Hotel for two officers four men will be responsible."

The AAF man read the message and gulped, but he stood loyally firm, insisting that the message was probably code, and undoubtedly some form of government business. In time the communications officers let the message be transmitted. The next day the Marine colonel came through.

He explained that there was $600 in his outfit's recreation fund for a new supply of athletic equipment. In sending his message, the colonel had supposed everyone knew that sporting houses sell bats, balls, gloves and tennis rackets. Knowing that New Zealand stores are closed from noon Saturday to Monday, he had merely wanted to be sure the best store for athletic equipment would be open when he arrived.—The Editor. ☆

PICTURE CREDITS

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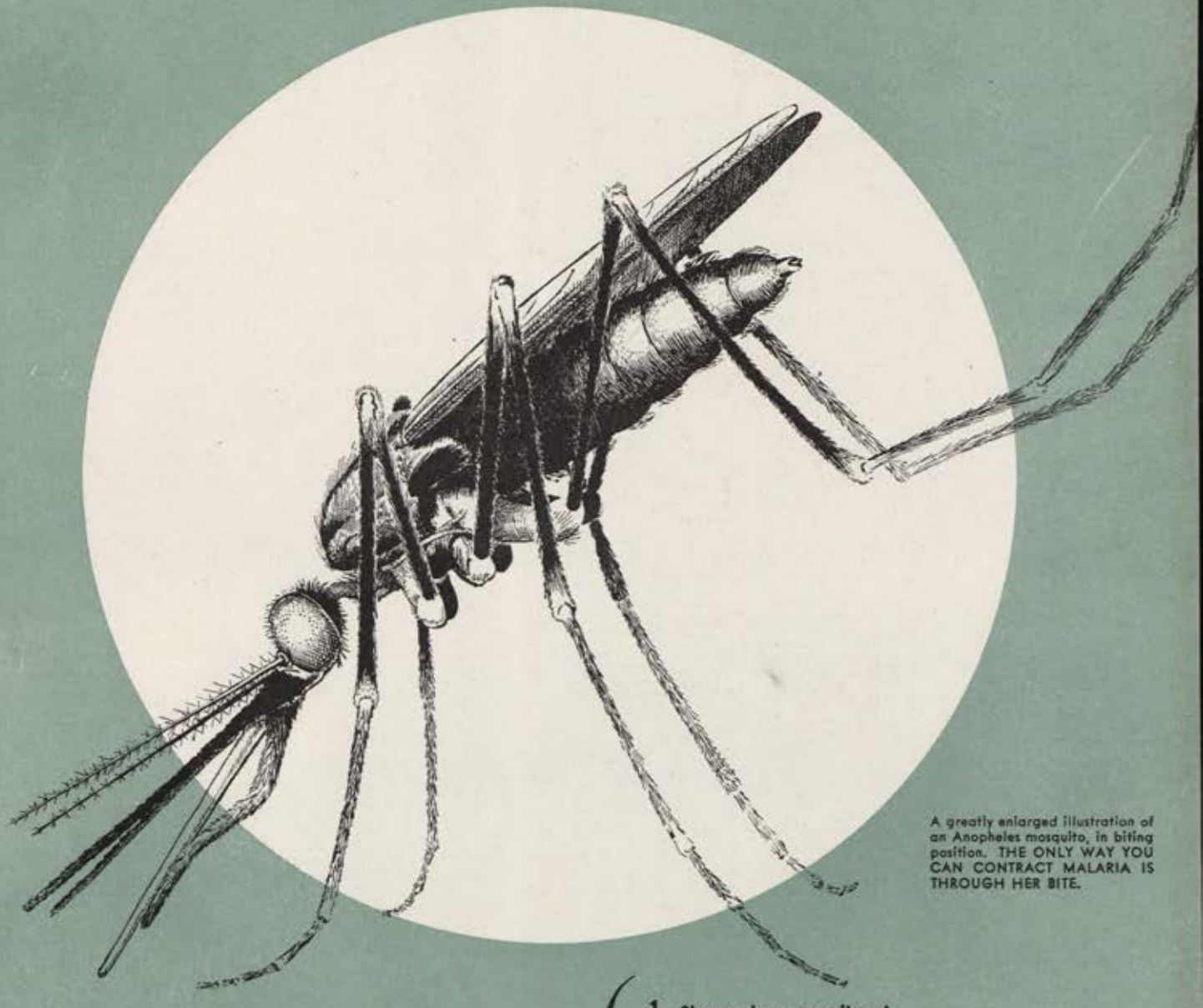
Answers to Quiz on Page 61

1. (b) 2,000 miles
2. (d) On a weather map
3. (b) Between Greece and Turkey
4. (a) B-24
5. (a) Single engine fighter
6. (a) Maj. Gen. Howard Davidson
7. (d) 385 and 400 mph
8. (c) Madison, Wis.
9. (b) North of New Ireland
10. (b) Measure the degree of moisture in the atmosphere
11. (a) 100,000
12. (c) The British carrier-based version of the Spitfire
13. Red, White and Blue
14. (d) QQQ
15. (b) False
16. (d) Soviet fighter plane
17. (b) Gasmata. The others are located on New Guinea; Gasmata is on New Britain.
18. (b) Garlic
19 and 20. The plane at left in the picture is a P-38; the other is a Jap Hamp or Zero. The enemy fighter was captured intact in the South Pacific and this photo was made during a mock air battle.

THE MEDIUMS ARE ON THE JOB

Our medium bombers have long since joined their "big brothers" in blasting enemy targets in war theatres around the world. From bases in England, B-26s are striking German airdromes and communications adjacent to the invasion coast; B-25s and 26s are running missions ahead of our ground forces in Italy; Mitchells, many of them with fire spouting from 75s in their noses, are pasting the Japs in Burma, China, in the Southwest Pacific and now, with the capture of forward bases, in the Central Pacific area. Bombing and strafing operations of the mediums against enemy airdromes in the various combat theatres have accounted for the destruction of Jap and German aircraft by the hundreds. This unusual photograph was taken from the cockpit of one of the planes in a B-26 formation headed for targets in northern Italy.

This, too, is your enemy



A greatly enlarged illustration of an Anopheles mosquito, in biting position. THE ONLY WAY YOU CAN CONTRACT MALARIA IS THROUGH HER BITE.

PROTECT YOURSELF AGAINST MALARIA

1. Sleep under a mosquito net.
2. Use your head net. Keep your sleeves and trousers rolled down and your collar buttoned. Wear protective clothing.
3. Use issue repellents on exposed parts of your body and on your clothing where it is tight.
4. Use GI sprays and bombs to kill mosquitoes wherever possible.
5. Avoid needless exposure, especially at night. Stay away from native villages.

TAKE ATABRINE AS PRESCRIBED