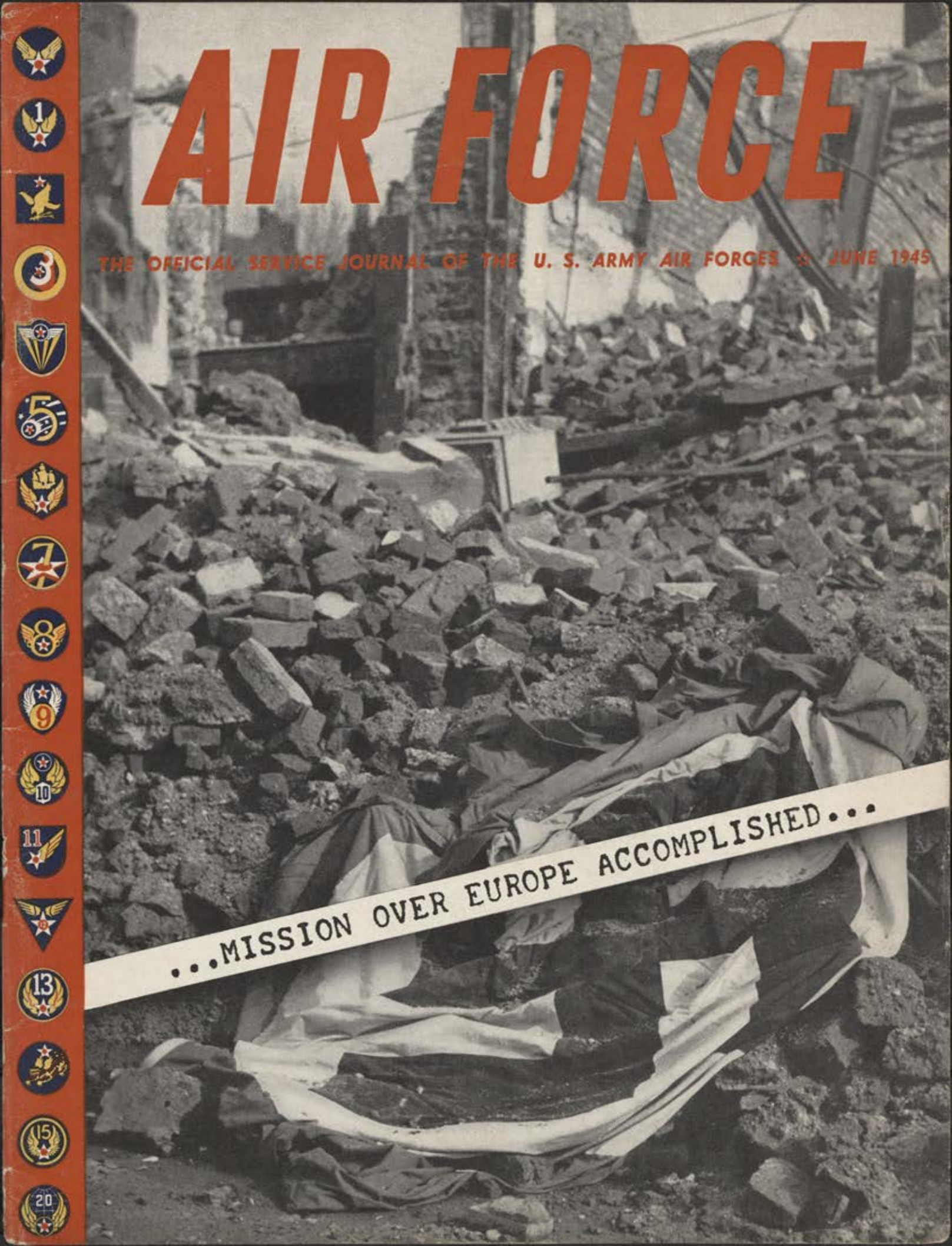


AIR FORCE

THE OFFICIAL SERVICE JOURNAL OF THE U. S. ARMY AIR FORCES • JUNE 1945

...MISSION OVER EUROPE ACCOMPLISHED...



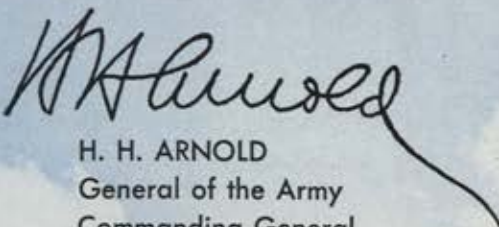
To all personnel of the Army Air Forces:

The might of the German Army has collapsed, and its leaders have agreed to Allied terms of unconditional surrender. I am happy now to be able to send my congratulations to the Army Air Forces for pressing our attack to a smashing climax. We stand now at the peak of our offensive power. As this is written, plans already are in motion to divert an avalanche of military might against our only remaining enemy—Japan.

The weapon that strikes home in modern warfare is the airplane. In our growing offensive against the Japanese, the Army Air Forces will play a vital role. At the same time, they must supply the punch to occupation forces throughout the world. Finally, they must maintain a network of supply and transport lines to all corners of the earth. A gigantic job remains to be done, and until it is done, no large-scale demobilization can take place in the AAF.

Those few men who can be spared will be returned to civilian life as rapidly as possible. They will be released from the AAF under the same standards that govern release from the Army Ground Forces and the Army Service Forces. Our rotation system will be accelerated. But for most of us, let me make it plain: We are fighting men in a fighting organization, and just as long as a single Jap ship, submarine, air squadron, or company of infantry remains to challenge us, our job is not done.

We are in this fight to the finish.

A handwritten signature in dark ink, appearing to read 'H. H. Arnold', with a long, sweeping flourish extending from the bottom right.

H. H. ARNOLD
General of the Army
Commanding General
Army Air Forces

Rendezvous

Captivating Cover

Dear Editor:

The WAC detachment of Spence Field is completely captivated by this month's cover (April issue).

It is quite evident that S/Sgt. Robert Gable would never lack pen-pals, etc., but he is elected as Spence Field's pin-up boy.

Can't we have his address? If Sergeant Gable will consent to this, please forward same in care of the undersigned, one of several eager to make his acquaintance.

Muriel J. Oakes,
Spence Field, Ga.

Sorry, girls. Sergeant Gable is happily married to his childhood sweetheart. While overseas, he wrote her every night.—Ed.

A GI and His Dog

Dear Editor:

Today I was reading the March edition of AIR FORCE and you could have knocked me over with a feather when I glanced at Page 37. There is a picture of a staff sergeant and a dog. I am dead certain that that dog belongs to me. I will explain.

When I was in Charleston, S. C., as a member of a heavy bomb group, we went out on a bivouac to Waltersboro, S. C. for about a week. The camouflage engineers there had a dog who gave birth to a litter of nine pups. I got one of them and named him "Bivouac."

That was in September, 1943. We were getting ready to go overseas. We got him a rabies shot and distemper shot at Mitchel Field. On the way over (we were flying over) the dog got pretty sick. I kept taking him to the vet's and nursing him and he finally came around after a few weeks. I had to carry him every place as he couldn't walk. Eventually we arrived in Italy.

We were a few miles from Cerignola in southern Italy. I pulled part of my missions and one day we were told we were going home on a 30-day rotation plan and would return after the furlough. I wanted to take the dog with me but was told I wouldn't be able to bring him on the boat.

I went home and had my furlough and went back to Italy only to find that the plans were changed and we were to be sent home again. I went back to my group to get my dog and I was told he was shot by an MP. Some of the fellows said he was seen in Bari. I didn't have time to go there, and anyway I was convinced he was dead. That was August, 1944. I went home and until today, had believed he was dead.

That's my dog. I know it is. If it ain't I'll eat all the sand in Texas. I would like to know where he is, who has him, and if there is any way I can get him back. I

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

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How Sharp are YOU?

A Photo test of Your Observational Accuracy

This photo was taken at Mitchel Field, just after an air evacuation plane had come in from the ETO. Look at the scene for 60 seconds, try to remember as many details as you can, then turn to Page 43 and see if you can answer the 10 questions we have asked about the photo. Score 10 for each question answered correctly. 70 is average, 80 is pretty good, 90 is peachy, 100 puts you at the head of the class.

HOW SHARP ARE YOU? Turn to Page 43

Rendezvous

(Continued from Page 1)

have pictures of him when he was a pup that are identical to the picture of the dog in the picture. My tail gunner is with me now, and he says the same thing.

S/Sgt. Martin H. Green,
Laredo, Texas

We received the picture from the Public Relations Officer, Hq. MAAF, and we suggest you write to him, c/o Postmaster, New York City.—Ed.

No Reflection

Dear Editor:

Before writing this maybe I should take a quick trip to the flight surgeon to see if my eyes are still 20-20, for AIR FORCE's April '45 "How Sharp Are You," Question 8, tells me there is "one" hatless man in the picture—I see two.

Take a look at the GI's reflection in the searchlight, and I believe that you will agree with me—do I get 100 or only 90?

W/O Lloyd D. Butler,
Harlingen, Texas

Take a quick trip to the flight surgeon.—Ed.

Personal Equipment T/Os

Dear Editor:

In your December 1944 issue, we read with interest your story on "The Careless Die Early." We are the enlisted men of a Personal Equipment Section, but we have yet to see the T/O your article mentioned as covering us. We do all we can to insure a safe flight for our flyers and hope that someday a T/O will come through as it did for our officers. We are still sweating it out.

Sgt. Guido Blanda,
and nine other enlisted men of
a heavy bomb group in the ETO.

Headquarters informs us that for sometime T/Os for single-engine fighter groups have provided for enlisted personnel in the Personal Equipment Section. Similar provisions for very heavy, heavy, medium, troop carrier, twin-engine fighter and night fighter groups are made in new T/Os and T/Es just published. The EM authorized carry MOSs other than Personal Equipment at present, but an MOS for Personal Equipment Technician is in the process of authorization.—Ed.

Further Clarification

Dear Editor:

Referring to the letter of 1st Lt. Peter M. Bowers, published in the April issue of AIR FORCE, in which he states that the Zeppelin biplane, shown in the December issue of the magazine, is the Siemens-Schuckert R-VIII, the following may help to clarify the subject: the aircraft was actually built by the Zeppelin works in Lindau, Germany, although the design might have originated with the Siemens-Schuckert concern, which has designed and built a number of very large multi-engine

aircraft, in 1918. About that time there existed a licensing agreement between Siemens-Schuckert and Zeppelin, and one dirigible was constructed by Siemens, while the Zeppelin works produced a number of "Giant" airplanes ranging in span from 130 to 150 ft. "Jane's All the World's Aircraft for 1919" credits these "Giants" to Zeppelin without mentioning Siemens-Schuckert.

The Basse-Selve, mentioned by Lieutenant Bowers, were used only experimentally because they were the only ones capable of producing anywhere near the horsepower required to fly the airplane. They were later replaced by the Maybach engines rated at 300 hp each. This substitution was also governed by the fact that Zeppelin works used almost exclusively the Maybachs to power their dirigibles and that they were a great deal more reliable than the Basse-Selve engines.

Based on the above, the original caption, calling the German "Giant" a Zeppelin biplane, is correct.

Alexis Dawydoff,
Recognition Branch, AAF

An Appreciation

Dear Editor:

Our heartfelt thanks for your recognition of the Air Force clerk in this month's copy of AIR FORCE. Believe me, sir, it's just the stimulation we need in doing this job that is full of boredom and monotony. To our knowledge, "405 Clerk, Typist" is the first article published in which recognition is given to the some 337,000 pencil and typewriter pushers in the AAF.

However, the cover and the text suggest that the clerk-typist is an NCO. May I alter this impression by mentioning that there are many Privates and Privates First Class with the MOS of 405 and even 502. Regardless, we'll still hold up our end by making out the furloughs and passes, keeping the service records, typing the hundreds of forms necessary for the movement of personnel and supplies and, in brief, typing our Air Forces to a grand victory.

Pfc. Richard H. Mazy,
Pfc. Sam A. Munafo,
Mather Field, Calif.

The Right Answer

Dear Editor:

While checking out in the AAF Quiz of the April issue of AIR FORCE, I noticed this error under question number twelve (12): Sez you, "The C-109 is a B-29 used as a fuel carrier." Stop me if I'm wrong, but having processed a few of the big iron birds, I practically guarantee you'll find the C-109 to be a modified version of the B-24, not of the B-29. It is, however, a fuel carrier. True?

S/Sgt. Charles J. Reeves,
Sq. D., Hunter Field, Ga.

To the sergeant and many others who caught this error: The C-109 is not a modified B-29. This airplane is a modified B-24 with built-in gasoline tanks which make it a tanker. It is used in China and I-B as a fuel carrier to supply the B-29s.—Ed.

(Continued on Page 46)

In This Issue

On our cover this month are the words: "Mission Over Europe Accomplished," backed by a photograph by T/Sgt. Roger Coster showing the ruins of a bombed-out German industrial center. These ruins are symbolic of the contribution which the Army Air Forces made to the prosecution and winning of the war against the Nazis, paralyzing their industry, obliterating their sources of oil, destroying their transportation systems. German General von Runstedt has stated that the biggest single reason for Germany losing the war was the Allies' tremendous air superiority which pinned down the Wehrmacht. To all the air force people who participated goes credit for a tough mission, well accomplished.

Next month we hope to announce publication of the first Far East Edition of AIR FORCE, printed in Manila. A dispatch that arrived at this writing, however, has made us cross our fingers. Here's the situation: Our paper and ink is on a ship in Manila Harbor. That should make us all set, but we are told that said paper and ink is at the bottom of the hold. On top of the hatches are loaded locomotives. It so happens that rails have not yet arrived, and the decision is that the locomotives will not be unloaded until when and if the rails do arrive. Maybe we're being railroaded?

The picture at the bottom of the page shows our correspondent in the ETO, Capt. Eric Friedheim (without hat) talking to Maj. Gen. Harry J. Collins, (left) commander of the 42nd Infantry Division, and another war correspondent, shortly after the capture of Schweinfurt (see "Be-



neath the Rubble of Schweinfurt," Page 4). General Collins gave our AIR FORCE correspondent a captured Nazi flag to be presented to the 8th Air Force group which sustained the heaviest losses in the aerial attacks on this center of Germany's ball bearing industry.

Friedheim has been in the thick of things for quite some time. Remember "RhineLand Rendezvous" in the May issue? The week before participating in that airborne operation, Friedheim went on a recon mission in a Lightning, riding piggyback. Of that episode he reports, "We took photos of the front, from Cologne almost down to Luxembourg. We had a minor scare when an FW190 appeared to our left, but we were up at 7,000 feet and in the sun. We dived and got the hell out of there in a hurry because the Lightning wasn't equipped with any guns."

"From Kansas to Tokyo," Page 18, is no second-hand account. Maj. Milton R. Krims, AIR FORCE correspondent in the Marianas, went overseas with the B-29 crew he is writing about, shackled with them when they arrived at their Marianas' base, flew with them on the memorable first mission he describes. Krims didn't let it go at that, but has flown on B-29 missions to all four targets mentioned in the article, "Air Blitz Against Japan," on Page 31, for which he gathered the material. Earlier in the war Krims was CO of a combat camera unit in the Southwest Pacific.

Incidentally, it was appropriate that Capt. Raymond Creekmore should illustrate the "From Kansas to Tokyo" article. Creekmore went on the first B-29 mission over Tokyo, on which he took his memorable Fujiyama photograph (see "Target: Japan," in the January issue). Before his return to the States, Creekmore also visited the Philippines. In fact, the L-5 in which he was a passenger was the first of our planes to land on Clark Field strip proper. It was still under artillery fire at the time.



Beneath the Rubble of

The ruins of this captured German ball bearing center support American principles of strategic bombing, and furnish a memorial to pioneers of the 8th Air Force

BY CAPT. ERIC FRIEDHEIM
AIR FORCE Overseas Staff

From the vantage point of an L-5 in the morning sky, there was a clear view of the town ahead and of the ring of German artillery dispersed in the fallow Bavarian fields around it. German troops and armored columns moved through the streets past rubble heaps and blackened buildings. A giant swastika waved defiantly over the factory chimneys near the railroad yards. The name of the town was Schweinfurt.

At an American field headquarters a few miles from Schweinfurt, commanders of the 42nd Infantry and 12th Armored Division hurriedly debated their next course of action. They had two choices. One was to punch through the circle of artillery and drive into the well-defended town. The other was to wait until airpower could soften things up a bit before the tanks and infantrymen advanced. It was decided to call on the air. While they waited, the 42nd laid down a withering artillery barrage on the German gun positions. The marksmanship was good and within a short time a number of the enemy's 88s had been zeroed by the division's gunners.

A few minutes before noon 72 Marauders from the 1st Tactical Air Force swept overhead. Threading their way through the antiaircraft fire, they carefully deployed when reaching the town. Bombs cascaded on enemy columns in the streets and on tightly massed vehicles in the center

of the town. A second wave of 48 mediums arrived immediately after the first formation had completed its bomb run. It caught some of the enemy concentrations that were streaming northward in a desperate effort to find safer positions near the suburbs.

When the second wave had passed, American infantry and armor moved forward, but there was still some fight left in the Germans. At 1700 hours a third force of 72 Marauders came in and gave the town a final going over. In a matter of hours the 42nd Division had fought its way into the outskirts. The next day Schweinfurt surrendered.

To the soldiers of the 42nd and the tankers of the 12th Armored, the name Schweinfurt didn't mean very much. To them it was just another name on the long road into Germany. Doughfeet of the 42nd had been moving steadily since the winter break-through that cracked the Siegfried line. The ruins of Wurzburg were behind them, and they stopped in Schweinfurt just long enough to paint the division's rainbow insignia on the Rathaus wall before setting off toward Nürnberg.

But to the American Air Forces generally and to the 8th Air Force in particular, the fall of Schweinfurt had deeper significance. Its capture ended a dramatic chapter in American military operations—the opening pages of which were written with the blood of a gallant band of airmen on a sultry summer's day in 1943. Its capture was the climax of what had started as a crusade back in the days when the American principle of strategic air warfare was still being greeted with skepticism.

Now, as the doughfeet of the 42nd Division and those of other Allied ground forces were marching across Germany, there was evidence everywhere to uphold the American bombing principle. On April 15, as a striking coincidence to the taking of Schweinfurt four days earlier, came a special Order of the Day from Headquarters, U. S. Strategic Air Forces in Europe, formally announcing that the strategic air war against Germany had ended victoriously and that hereafter our heavy bombers would be used for tactical operations. All strategic air units would continue with undiminished effort the final tactical phase of air action, said the Order of the Day, but the grueling strategic attacks against the heart of Germany's war machine had achieved the basic objectives.

For months the 8th and 15th Air Forces had roamed



The Nazis had started reconstruction at the Kugelfischer works, but the AAF's relentless bombing kept the area covered with rubble.

SCHWEINFURT



Spilled among the ruins of the Kugelfischer factory (foreground) are the ball bearings which had been the target of 8th Air Force heavies since Aug. 17, 1943. Background aerial view shows bomb bursts scored by B-17s in April, 1944. Attacks sent Germans underground.

JUNE, 1945

over Europe virtually unopposed, and it wasn't unusual to find more than 2,000 of our warplanes in the air on a single strategic mission. The strategic effort had come to a conclusion after an unprecedented battering of key targets which added emphasis to the conclusion that the Luftwaffe had been destroyed.

But one couldn't forget that many months before it had been the task of a hardy bunch of pioneers of the 8th Air Force to prove the efficacy of this type of aerial warfare. And one couldn't forget that it was this Bavarian town of Schweinfurt that nearly became a milestone marking the way to the defeat of a brave campaign—the campaign to show that the American theories of strategic bombardment were practical, that they would hasten Germany's doom, and that the cost in men and equipment would not be disproportionate to the results.

It was on August 17, 1943, a day marking the first anniversary of 8th Air Force combat operations, that 230 B-17s rose from their British bases to attack Schweinfurt's sprawling factories, from which flowed at least half of the ball bearing output in Germany and occupied Europe. That same day a companion force of 150 bombers set out for the Messerschmitt assembly works at Regensburg where they were to unload their bombs and proceed on to North Africa in the first American shuttle mission of the war. The combined force of these two missions was a small effort by present standards, but at the time it was the largest number of American bombers yet dispatched.

The Germans were ready for us at both Regensburg and Schweinfurt and put everything they had in the air. There was fighter escort only part of way against each target and the still potent Luftwaffe had a field day. One Fortress group on the Schweinfurt mission was attacked by 300 German fighters that peeled off 25 at a time into our formations. The effort against Schweinfurt cost 36 bombers; the Regensburg force lost 23 more. The 8th Bomber Command had lost more aircraft in a single day than in the entire first six months of operations over Europe.

Stung by this heavy loss, there were some who wondered if daylight attacks were the right thing after all. Then came October 14, 1943. The 8th Bomber Command sent 226 B-17s to Schweinfurt, now designated the most important target in Germany. Our bombers were met by 400 German fighters, among them twin-engine rocket-firing planes, the first time they had been encountered in force. The enemy struck in a perfectly timed and skillfully executed operation. Single-engine fighters came in from the front firing machine guns and cannon. Waves of the rocket-firing

planes followed, standing off and launching barrages of their 8.3 inch projectiles from a distance. Then the single-engine planes attacked from all directions, followed closely by more rocket-bearers boring in from front and rear. Walls of flak were sent up by hundreds of anti-aircraft guns. The fighter attacks persisted from the time the bombers reached Luxembourg until they were over the Channel on the return trip. The lead group encountered as many as 100 German aircraft attacking from all directions, had the automatic pilot equipment of its lead plane shot away before the bombing run, yet under these difficult conditions set a bombing pattern that resulted in 36,000 pounds of its bombs landing within a 1,000 foot target area, and 79,000 more pounds within a 2,000 foot target area. The other units of the attacking force followed the lead group, bombing with results that were appraised as "severe," "highly successful," "crippling."

But 60 Fortresses failed to return from the Schweinfurt attack of October 14, 1943. It was by far the greatest single-mission loss of the war to date, and the outcry against daylight precision bombing intensified. From several quarters came expressions of doubt that the heavy toll in men and equipment could be justified. Perhaps strategic bombing could not be conducted efficiently by daylight? Perhaps the strategic concept itself was not worth the price?

Those who controlled the destinies of American airpower remained steadfast against the mounting criticism. They were convinced that their cause was sound and that the Schweinfurt losses had been more than justified by the importance of the target and the damage achieved. They explained that the enemy needed ball bearings to operate his war equipment—airplanes, trucks, tanks, gun carriages, torpedoes, even submarines—and that the German ball bearing industry represented a potential war production bottleneck because it was impracticable to assemble any considerable stockpile of the bearings. From Washington, the President, and the Commanding General, AAF, reassured the nation that at Schweinfurt the enemy had received a smashing blow to one of his most vital industries, and that the American principle of strategic air warfare would be upheld by future events. But it was difficult, as it has always been, to answer air losses with aerial bomb damage photos.

Those of us who entered Schweinfurt behind the infantry this April day of 1945 recalled all this as we stood amid the charred and tangled ruins of what had once been the capital of German ball bearing production. We walked

(Continued on Page 61)

The city lay smashed and shattered from constant bombings. AAF mediums hit Nazi infantry and artillery day before Schweinfurt fell.



Germany's wheels of industry stopped rolling — trucks, planes, machinery, ships, tanks, all needed Schweinfurt's ball bearings.





ILLUSTRATED BY SGT. LOUIS S. GLANZMAN

As AAF men joined in drinking toasts to

Victory in Europe

they also lifted one for the road . . . to Japan

BY MAJ. ARTHUR GORDON

AIR FORCE Overseas Staff

To AAF men in the ETO, V-E Day seemed to come with maddening slowness. When it came, it simply made official what had been inevitable for weeks. Germany had surrendered unconditionally: the war in Europe was over.

At AAF bases from the windswept bleakness of Iceland to the hot glare of the Mediterranean men looked at one another with a queer finality and said in a thousand different phrases and with a thousand different inflections: "Well, it's over. *Fini la Guerre*. This part of the job is done, anyway."

Often they said it rather flatly. The edge was off the news. There had been too many rumors, too many conflicting reports, too many false starts. In most minds, moreover, there was still a large question mark about the future. "Now what?" they asked one another. "Most of us will get a crack at the Japs—that's sure. But do we go direct, or do we go home first, and who will be tagged for the occupation air force?"

Nobody seemed to know the answers to such questions. But there was one certainty that overshadowed all the rest. The Germans were finished. On the shattered cities of the Third Reich—the Reich that was to last 1,000 years—no more bombs would fall. Our fighters would still sweep the skies over Europe, but the tapes on their gun muzzles would remain unbroken. No flak would rise to meet the bomber boxes. No more airmen would be reported missing in action in this theater. There was much to be thankful for.

Even the Germans were thankful. The terror from the

skies that had wrecked their homeland, destroyed their Luftwaffe, and—on the testimony of their best field generals—paralyzed their Wehrmacht, was ended. In Wuppertal, German women put on their fanciest summer dresses and picked their way through rubble-filled streets. In Munich, they passed without a glance the ruins of the Hofbrauhaus and the repaired cellar where the Nazi movement began. Their faces showed their relief, but if there were any trace of remorse, any consciousness of war guilt, the Allied conquerors could not see it.

For the AAF men who flew and serviced the Britain and Italy-based heavies, the urgency had disappeared from the war days before, when Allied armies biting into the shrinking Reich overran virtually all the important strategic targets. Airmen of the 8th, their work of destruction complete, had turned to the more satisfying tasks of ferrying food to the starving Dutch or flying their faithful ground crews at low altitude over German targets to see for themselves the results of the air attacks their patient work had made possible.

At some airfields in Great Britain, all personnel were restricted to their bases on V-E Day. This did not mean that there were no celebrations. One group had hoarded 198 barrels of beer for just such a contingency. Stations were manned by skeleton staffs. Finding themselves without a war, the boys at one group fought a mock battle with Very pistols, sending colored flares arching across the late purple twilight.

Reactions of individuals differed considerably. Some felt a curious let-down, a distinct sense of anti-climax. Others felt a sudden surge of inarticulate pride in their country and its achievement. At the bar of (Continued on Page 62)



Bombs from formations of 13th Air Force heavies rock Cavite, Manila Bay.

AIR STRATEGY IN LUZON

By MAJ. THOMAS C. HARDMAN

AIR FORCE Overseas Staff

*How the Far East Air Forces
knocked the Japs' well-laid plans
for the defense of
Luzon into a cocked hat*

When American forces landed on Luzon in January and advanced rapidly down the rolling central plains, Gen. Tomoyuku Yamashita told the Japanese people that this was intended as a part of the Japanese defensive trap. He was only half kidding.

Probably the General still had hopes of effecting at least a part of his well-planned original strategy for the defense of Luzon, but he was destined to become the victim of two major blunders:

1. A gross underestimation of effective American air power and the unprecedented skill with which that power would be employed.

AIR FORCE



This attack occurred January 24, 1945.



The heart of Manila goes up in flame and smoke. Four large fires are burning between the Bay and the Walled City which is a heap of ashes. The wide stream in the midst of the town is the Pasig River and the cartwheel in foreground is Bilibid prison. Note the Jap ships sunk in the harbor.

2. His own indecision which resulted in chaos and disorganization among his ground forces at the outset of battle.

Within a matter of weeks, the greatest concentrated Jap air force in history was blown to bits, and an uncontested, smoothly-functioning American Air Force proceeded with a systematic reduction of enemy communications and ground installations in a display of air-ground coordination unparalleled in the southwest Pacific.

Admittedly anticipating that the battle of Luzon would prove decisive in the outcome of the Pacific war, Jap military leaders had planned an elaborate defense long before the Allied landing on Leyte. Full air strength was to be an integral part of that defense, and General Tominaga, commander of the Jap Air Force in the Philippines, had drawn into Luzon fighters and bombers from Burma, China, Manchuria, Formosa, the Ryukyus, Japan proper and even the Kuriles.

General Yamashita, meanwhile, had begun to deploy his ground forces where they would have greatest advantage when the invasion came. For example, in the Lingayen area, where our forces eventually landed on January 9, he had planned to place well-reinforced ground troops in the high country on both flanks of the central plains, with a third force across the plains inland along the Agno River line.

Then, while his men would move in on the invaders from three sides, Yamashita was counting on the Jap Navy to stop American supplies and reinforcements from the south. The defense plan was a natural. But it was upset when our landings succeeded on Leyte. The Japanese Com-

mand was forced to shift ground forces from strategic positions in central and northern Luzon to reinforce garrisons in the Batangas area south of Manila, to prepare for a possible follow-up landing in southern Luzon.

It was late in December before this movement was reversed. The wily Yamashita apparently had decided that the Luzon invasion would come in the north, in the Lingayen area—but he was too late.

Repeated blows by bombers and fighters of the 5th and 13th Air Forces, and carrier-based naval aircraft already had taken a heavy toll of Jap air strength. With Leyte secure, the 5th, joined by elements of the 13th, began to have a field day blasting Jap troop and vehicle columns as enemy forces attempted to scurry back to planned positions flanking the Luzon central plains to the north.

Maj. Gen. Ennis Whitehead, commanding the 5th, reported to Far East Air Forces Headquarters that his planes between Christmas Day and January 16 had knocked out 79 locomotives, 466 railroad cars, 486 motor trucks, 18 tanks and 67 staff cars.

As our ground forces rolled south from Lingayen Gulf, this drubbing from the air stalled what was left of Yamashita's strategy for the defense of central Luzon. One after another, bridges were bombed out and highways were blocked by strafing fighters with the result that the enemy found movement of his troops and equipment as organized units an impossibility.

No opposition was encountered from the hills along the west flank of the north central plains because no defenders had been able to reach this area. The few troops who strag-

gled into the mountains along the east flank were too disorganized to put up a fight.

Only in the Rosario sector in the north did the Jap line hold, and here Yamashita was able to throw in forces he had retained in northern Luzon and the few reinforcements which had run the gauntlet of American air and sea power to land in such ports as San Fernando up the west coast.

Our forces moving south finally encountered their first stiff opposition in the ridges overlooking Clark Field. The Japs had been determined to hold Clark at all costs. The vast influx of Jap aircraft was destined to prove of little value, however, in the defense of the Clark Air Center. For, in addition to their wholesale destruction by our Air Forces, most of the enemy planes were unable to get off the ground because of an obvious lack of ground and maintenance personnel. This deficiency occurred despite the presence at Clark of the Manila Air Depot, largest Jap installation of its kind south of the Japanese homeland. The air center had been elaborately camouflaged and protected, in



Liberator of the 13th AAF blasts away at Cavite Naval base, rebuilt by the Japs after it had been destroyed in 1942. Fires covered the entire area which contains arsenal, docks, cranes, and foundry.

addition, by nearly 700 heavy, medium and light anti-aircraft weapons supported by some 25 searchlights.

With our ground forces sweeping down the central plains with so little opposition that close air coordination became unnecessary, General Whitehead's airmen had turned their undivided attention to Clark. B-24s came in with tons of demolition bombs. Low-flying B-25s, A-20s, P-38s and P-47s crisscrossed the lush target with devastating effect. Concentrated .50 caliber fire, parafrags and parademos destroyed scores of planes on the ground, blasted flak defenses, hangars and administration buildings, and slaughtered Jap defenders who darted about in frantic effort to escape the sweeping fire that covered the area like a blanket. In the air Jap interceptors were knocked down as fast as they closed in for battle.

Clark Field as a Jap aerial stronghold was done for. Enemy ground forces continued stiff resistance in the nearby hills but the air center was securely in our hands by the first few days of February.

A scene of complete devastation greeted our occupation troops at the air center. Hundreds of Jap aircraft, all types, were scattered, twisted, burned and bullet-ridden through-

out the area. Others were found in relatively undamaged condition, affording our technical experts a happy hunting ground. Our emplacements were completely smashed, hangars and other buildings were demolished, and runways were pitted with bomb craters.

More than 200 new aircraft engines, some uncrated, were found buried under houses, in churchyards and beneath rice mills in a nearby village. Gasoline in 20 barrel batches was found underground in scattered areas. Even such equipment as carburetors, propellers, guns, tires, tools, generators and wheels had been cached in shallow pits all over the center. A number of underground shops were discovered, complete with electric power and generators.

The Japs had dispersed their planes over a wide range of territory. Some units were found more than two miles from the nearest runway.

While our engineers rushed in with their heavy equipment to repair and construct runways for our use, other enemy airfields throughout Luzon were being neutralized. Our B-24s also began to strike Formosa's vast network of airfields in earnest. The Japs soon became wary of coming up for a fight, whether the heavies were escorted or not.

Although some 20 of Formosa's airdromes were known to have held more than 400 aircraft during the last two weeks of January, our bombers went about their work with negligible opposition. Insulting jibes radioed to the Jap bases by confident airmen failed to get them off the ground. A sample taunt was this announcement by one of our pilots:

"Aren't you boys happy that you won't have to patrol this area any longer? We are taking over the job now."

An indication of the steady reduction of Jap air strength and the increasing reluctance of enemy pilots to oppose our planes can be gained by figures on enemy aircraft shot down over Luzon during the first three months of this year: January, 184; February, 14, and March, 4.

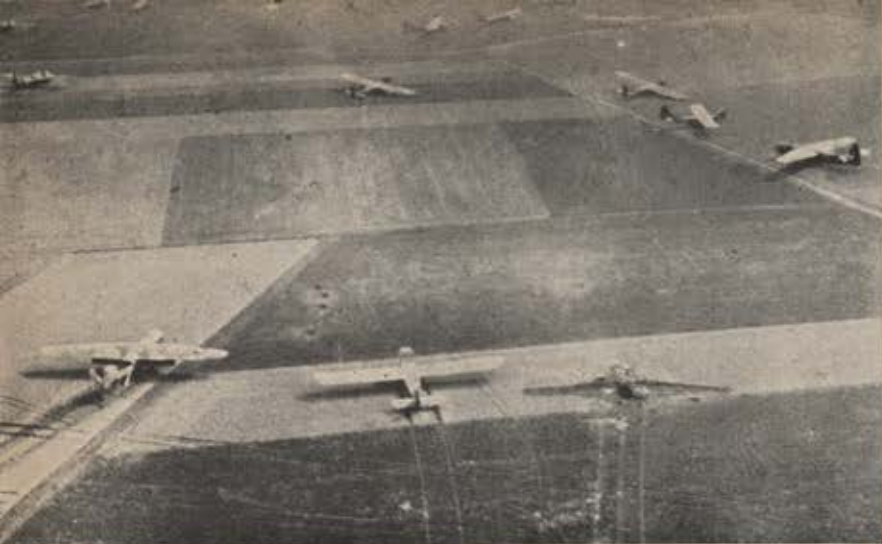
Meanwhile, our ground forces had bypassed the heavily-defended Fort Stotsenburg area and the advance toward Manila was continuing steadily. Enemy troops in the north, however, were fighting even more furiously as our drive in that direction threatened the remaining escape route from the south into the Cagayan Valley.

Bloody battles were taking place in the hills around San Manuel, San Nicholas, Umnigan, San Jose, Munoz and Rizal. It was in this sector that the Japs finally committed the armored division which had been held in readiness down in the central plains, but it was not employed in striking force. The enemy used it piecemeal in counterattacks and in antitank operations. With air power again aiding with low level strikes, our forces took advantage of this tactical boner, and the Jap soon lost his armored division. Remnants—minus armor—fled to the high country in the north.

As our troops entered the city of Manila and other invasion forces pushed inland from beachheads in the Zambales, Subic Bay, Bataan and Batangas areas, Gen. George C. Kenney took stock of the Luzon accomplishments of his Far East Air Forces. The figures were extremely gratifying. From January 1 through February 30, our aircraft, under the tactical direction of the 5th Air Force, had flown every day, despite frequently inclement weather; had dropped 47,485 tons of bombs, expended 28,500 rounds of 20 mm ammunition and 3,060,000 rounds of .50 caliber ammunition.

The General studied an impressive array of targets struck. One thousand, five hundred sorties against Luzon's airfields; 1,600 more against targets of opportunity which included roving strikes on troop concentrations, gun emplacements—

(Continued on Page 61)



Field filled with AAF and RAF gliders shows strength of operation. Glider at right foreground caught fire during the landing, was reduced to ashes.

AIRHEAD

At 0100 hours on March 24th divisions of the 18th U. S. Airborne Corps began landing in an area 2-5 miles northwest of Wesel. They captured six bridges across the Ijssel River, made contact with British units sweeping eastward from the Xanten area.



One of "Raff's Ruffians" hangs helplessly from treetop.

Glider troops of the Airborne Army take cover against German defenders of the area. A total of 40,000 men participated in this operation.



From Dusk to Dawn

By an AIR FORCE Overseas Staff Correspondent



At 8,000 feet the night was crystal clear and the lone A-20, knifing across the German lines, had little difficulty in picking up the Saar. When he reached the river, the pilot banked slightly and, with the coaching of his navigator, set course upstream to the target area. In a few minutes, the A-20 was close to Taben.

"This is it," the navigator said.

Quickly he made a final check, and while the pilot held the Havoc level, he released the flash bombs.

Within seconds, the sky and ground were drenched in the brilliance of an 800,000,000-candlepower light. Automatically the shutters of the cameras started snapping. Greedily, the camera drank in every detail of the terrain below.

An hour later, the A-20 was back at its Belgian base. At the mobile laboratory in a nearby forest, interpreters studied the photographs.

They noted with interest two bridges spanning the river near Taben. One was a two-span, concrete highway-bridge that had been badly battered during a recent Allied bombing. The photos clearly showed this structure still was unserviceable. The other was a steel-girder type in process of construction. Under the magnifying glass, however, the photograph revealed that a temporary flooring had been laid across the bridge's framework, indicating it was capable of handling enemy traffic.

Thus was exposed a trick by which the Germans hoped to fool Allied intelligence about their troop movements. The fact that the enemy was building the bridge was well-known to our G-2. Reconnaissance planes, flying in daylight, had been keeping a sharp eye on the construction work for several weeks, and Allied bombers were ready to pounce on it the moment it was finished.

The Germans, however, had no intention of completing the job. Reasoning correctly that the bridge wouldn't be bombed so long as it appeared unserviceable, the Germans had been placing a temporary flooring on the span nightly. Troops and supplies moved across until early morning, at which time the flooring was removed. As a result of these photos, we promptly removed the bridge.

This bridge incident is a good example of the important role played by night aerial photo-reconnaissance in the Rhineland operations. Because of overwhelming Allied air superiority, there was little the enemy could hide during daylight. To keep his movements secret, he was forced to rely mainly on bad weather or the cloak of darkness.

There was nothing we could do about the weather, but the 9th Air Force's 155th Night Photo-Reconnaissance Squadron ranged over hostile territory taking pictures of road traffic, gun positions, staff headquarters and railway lines. This detection of enemy activities from dusk to dawn proved invaluable to our armies on many occasions.

"Give us a good clear night," says Lt. Col. Joe Gillespie, commanding officer of the 155th, "and in many cases we can find out if Jerry is trying to put one over on us."

On the face of it, night aerial photo-reconnaissance ap-

*When the cameras of the night photo
reconnaissance boys pick up
bustling enemy activity,
it is certain that the bombers
will pay a prompt follow-up visit*

pears to be a simple chore. The three-man crews who fly the camera-planes of the 155th leave their Belgian airstrip a few hours after dark, and usually are over the targets across the Rhine in 45 minutes. Photographing a highway, a crossroads or a marshalling yard is a matter of five minutes' work, and the planes are back at their base within two hours after taking off.

Most of the combat roster of the 155th is composed of volunteers. The squadron likes to use men who have had experience in night fighting.

Aerial photography at night is still in the primary stage of development. The Germans have made some progress with complex cameras that can take pictures from altitudes as high as 25,000 feet. American effort in this field—much of it under the direction of Col. James G. Hall and Lt. Col. Richard W. Philbrick, veterans of air reconnaissance operations—has resulted in many advances. But there still is much to be done before the art is perfected.

For this reason most of the work performed by the 155th Squadron has been of a pioneering nature. The outfit has functioned as a tactical unit, with all the attendant dangers, and at the same time has served as a flying laboratory, testing new equipment and techniques of photography. The squadron has been forced to modify aircraft and equipment during the swift tide of battle, often overnight at front line airfields where there is a scarcity of tools and an abundance of discomfort.

Since the mission of a night photo-reconnaissance plane is flown entirely by radio aids and instruments, the squadron has spent many wearying hours of extra transitional training for its pilots and navigators. To fly through a blackened sky and pick out a quarter-mile stretch of highway or a few hundred yards of railroad siding on the map of Europe requires navigation of the most exacting sort.

To the casual observer, this type of operation might seem a reasonably safe and pleasant way to fight the war. The truth is, however, that the job of night photography in conjunction with the Rhine operations was an extremely hazardous assignment.

There was the night when most of the squadron's Havocs took off to photograph troop movements east of the Rhine. One of the A-20s, piloted by 1st Lt. Edward Bielinski, of Chicago, was enveloped by an overcast soon after leaving the target.

Bielinski took the plane up to 12,000 feet and then down to the deck to find an opening. But the cloud front was a solid wall and he gave the bail-out signal.

1st Lt. Stanley Stipick, of Burlington, Pa., the navigator, went out through the nose hatch and while he was drifting earthward he remembered that when he took his last navigational fix the plane was just above the German lines.

"There was a 50-mile gale blowing," he related, "and it blew me right back into Germany."

Landing on a snow-covered field, he started walking west.

(Continued on Page 63)



Lt. Col. Joseph G. Gillespie, Jr., CO of the 155th Night Photo Reconnaissance Squadron, handles the pre-midnight briefing.



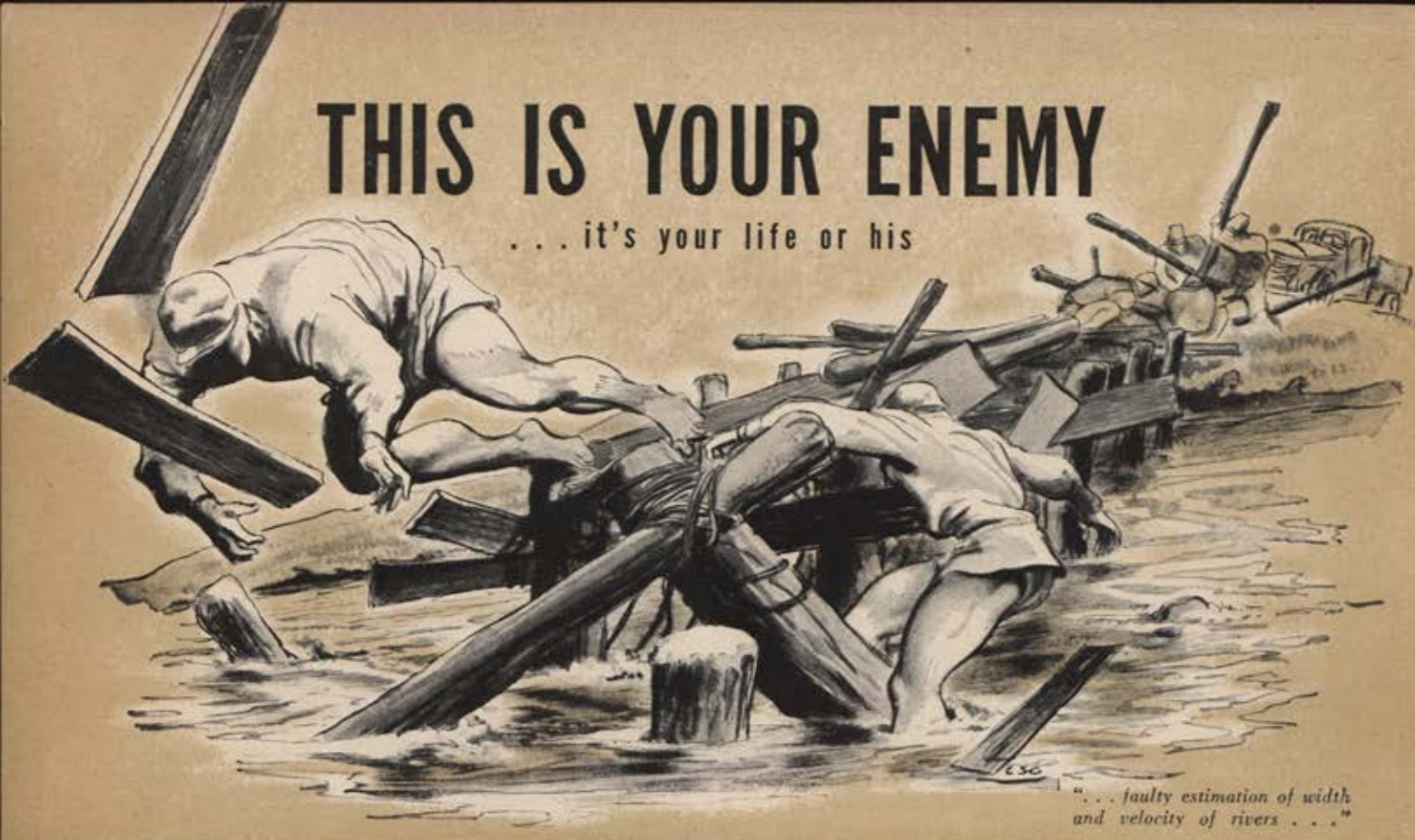
An ordnance mechanic sets fuzes of the flash bombs which, upon explosion, will emit light equal to 800,000,000 candlepower.



T/Sgt. John McNicol, photo plotter, checks photographs to determine if recon crews covered areas indicated in field orders.

THIS IS YOUR ENEMY

... it's your life or his



ILLUSTRATED BY SGT. LOUIS S. GLANZMAN

Seeing the Picture. The Japanese are having their troubles with photo interpretation. A training critique on the subject points out that "great errors in interpretation" have considerably hampered the military progress of Nippon. Among the blind spots are bridges, jungle terrain and rivers. The Japs, they tell their PIs in training, have incurred great losses from the following types of slips: assuming that 80 cm. footbridges will carry military vehicles; not recognizing steep slopes, marshes and narrow roads in the jungle; faulty estimation of width and velocity of rivers. It appears that some Jap PIs have assumed that any narrow river means an easy crossing, but troops ordered ahead have often hit gorges and impassable rapids.

Jerry Propwash on Fighters. Even a Nazi has a right to his opinion about aircraft. German pilots, discussing fighter planes, naturally list their own among the very, very good. As for Allied fighters, they have mixed opinions, based largely on combat under 20,000 feet. Following comments are typical: "P-51—only the best ME109 pilots can out-turn it." "P-47—great diving speed and ability to absorb punishment." "P-38—extremely fast in a climb." "Tempest—speed, climbing ability." "Spitfire—most formidable, rapid climb, tight turn." Of their own fighters the Luftwaffe pilots add that they consider the ME109 better than the FW190 in a turn and dive, but the FW they rate as a great climber.

Signals Off. A member of an air-ground team in Burma was embarrassed not long ago by unexpectedly close liaison in the wrong direction. He says that he was directing the attack of 12 P-40s against Japanese positions shortly to be attacked by Chinese ground forces. When a flight of four planes came over, he was right on the ball. "Four of you are directly over my position," he reported. "The target" Then he saw the large red blots on the wings. From

a distance his message was taken up by the P-40s, which had already spotted the Oscars just above him. He is now majoring in aircraft identification.

They Don't Know Everything. Long ago the Japanese publication Koku Asaki printed pictures of B-17s in flight, with Fuji in the background. Besides Fortresses, B-24s, P-40s, A-20s, PBVs, and other American aircraft have been re-conditioned and flown by the Japs. The fact remains, however, that the JAF has not succeeded in duplicating some of the most important American aircraft instruments known to have been captured. This is the answer to easy-going assumptions that just because a plane has been "shot down over enemy territory," all its secrets are spilled.

ME262 . . . by Stages. Employment of the ME262 has been described by expert observers as falling into three development stages. First, there was a period of "capability tests," in which the jets were simply "flown" into interception and avoided fighting. Obvious purposes were to acquaint pilots with their aircraft and "let the plane out" experimentally. Second, the ME262s concentrated their attack on escorts. Stragglers were special targets. Attempts were made to force planes to drop external gas tanks, cutting the range of the escort. Finally, the most recent development has been direct attack against bomber formations. Approach has usually been from 6 to 12 o'clock. When Allied planes have been strung out over a target, jets have usually ignored German flak and sailed in.

Arado Takes a "Nolo" Flight. After bail-outs, propellered aircraft have often flown crewless in this war. One of the earliest jet "nolo" flights was made by an AR234. The Arado was sighted in the Bielefeld area by a Mustang pilot. The jet was loafing along, and the Mustang easily overtook it. As the American came up fast from under, at about

10,000 feet, the German must have lost his nerve. Maybe he had read in the book that jets don't accelerate very fast at slow speeds. Anyway, he jumped. His plane continued to fly for about 10 minutes, during which time the P-51, which was equipped with cameras, followed it throughout its lonesome maneuver, taking pictures. The resulting movie was entitled, "The Unwilling Waffe."

Nipponese Notes. The Japanese have not only adopted the German buzz-bomb, but are also probably indebted to the Nazis for miscellaneous data on German jet planes. . . . Allied planes continue to report scattered use of Jap flak cars, land mines as antiaircraft defense, and rockets in various guises. . . . Sharp-eyed EAC interpreters spotted some fine "sitting duck" Sallies all ready for strafers. In the next picture, the same interpreters noted that AA emplacements had been added to the revetments. . . . Some Tojos are packing two 12.7 mm machine guns and a 40 mm. cannon. . . . Among Jap antiaircraft projectiles spotted at Iwo was a parachute missile seen at 2,000 feet. The container, suspended by a four-foot cable, was about 2 feet long. Coming down, it spurted flame. . . . Reports that Japanese fighters are pressing their attacks more closely than before have been accompanied by a summary of B-29 gunnery results from a series of missions. Out of every 8 Jap fighters attacking within range, the Superfortress gunners destroyed, probably destroyed, or damaged 3 of them.

Air Sagas of the JAF. "While lying in wait for enemy raiders at an extremely high altitude, I spotted a formation of B-29s. One enemy plane lagged behind 1,000 meters. Its altitude was 8,500 meters. As its right wing slid about 100 meters below the belly of my plane, I pounced on it. I opened fire and riddled the B-29 with incessant shots. . . ." That is Sub-Lieutenant Masuda broadcasting on Radio Tokyo for the Japanese Army Air Forces, which have begun to make a regular thing of air heroes' stories.

Perhaps the individual is still submerged in his unit and the Empire, but individual exploits are good grist for the propagandists. Radio Tokyo and Domei are collaborating on the series. The pattern is pretty well set, and follows a dramatic prescription. A junior officer or noncom turns up before the microphone well primed. His story is always pitched against fearful odds. He introduces a bit of suspense here and there, but speeds up at the end, filling the air with adjectives and closing on a "spiritual" note. So Lieutenant Masuda goes on:

"The B-29 was mortally hit. It vomited black smoke and began to lose altitude. The smoke changed to white as the plane nosed toward Tokyo Bay. My fuel was running short, but I was determined to confirm the result. The enemy raider began to whine in agony. Violent explosions . . . huge columns of water . . . red and black flames . . . the raider was swallowed up. Unable to control my emotions, I shouted 'Banzai,' and returned to my base."

Japs over Airdromes. Summarizing Japanese methods of attack on American airdromes, the 14th Air Force notes the following recurrent tactics. Altitude of the bombers' approach varied from 4,000 to 6,000 feet, and intervals of attack ranged from five minutes to an hour. Usually bombers came in singly, although occasionally two or three

planes were over an airdrome at the same time. Direction of attack was consistent. There was a marked increase in demolition and incendiary bombs, and the use of the "banana" bomb was common. Japanese leaflet-raids were described as carried out in an "off-and-on, hit-or-miss, what's the use" manner.

End of a Myth. About 12 miles north of Bangkok lies the Don Muang airfield, perhaps the most important operational base in Siam. In Japanese propaganda it has been an

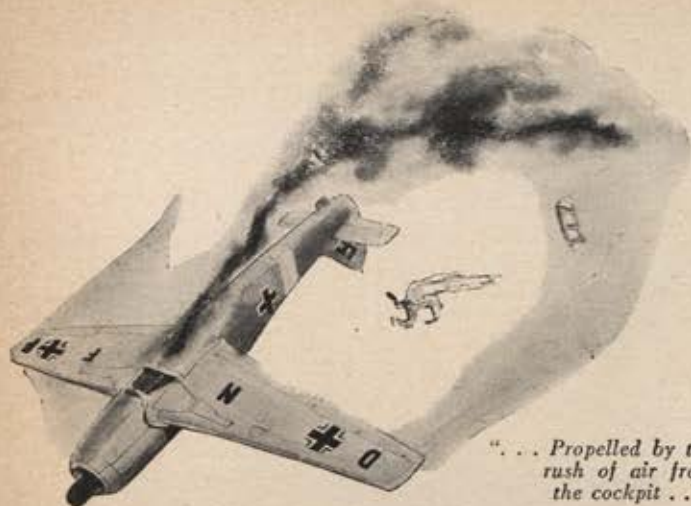


"... Mustangs . . . raised general havoc . . ."

example of the "unreachable" strong points of the Co-prosperity Sphere. Suppose, said the propagandists, that an occasional bomber foray did get in, never would there be anything but desultory attack, and never, never would there be systematic going-over by fighters.

At 1015 on March 15, over 35 P-51s set out from a field in Burma. Their target was Don Muang. Flying one of the longest single-engine missions of the war, the Mustangs reached the field and raised general havoc. One American plane was lost, one hit. The Japanese lost numerous planes, facilities, and a myth.

Japanese Phrasemaker. A phrase-making Jap correspondent covering Southern Burma has explained to Tokyo readers that American pilots in his theater are very funny. For example, he writes, these Americans fly their missions with such regularity that the Japanese ground forces have called



"... Propelled by the rush of air from the cockpit..."

their routine "The Time Clock." In the vicinity of the Old Burma Road to Yunnan, they often get "tripped by tree branches, throwing the Japanese into hilarious laughter." Equally side-splitting is the American "maneuver" in which the tail-end of one AAF plane smacks another, so that an entire formation goes down. The name for that one is "Airplane Nine-Pins."

Jots and Tittles. The newest name in German planes, TA154, honors the aircraft designer, Kurt Tank, who dreamed up the new fighter manufactured by Focke Wulf. . . . The new crop of V-1s turned up with occasional wooden wings—saving 50 pounds in weight. . . . To make Allied attackers believe that hits have been scored on German transports, the Wehrmacht recommends lighting smoke pots and gasoline containers for fiery effect. . . . The Germans have adopted flares planted on mountain tops as a means of aircraft warning. . . . A recent set of instructions to Jerries who bail out ends with a frank bit of hedging: "Release your safety belt. Jettison cockpit cover. Push control column hard forward. You will fly out, propelled by the rush of air from the cockpit and your forward motion, which tends to keep you moving horizontally while your plane noses down. Thanks to this downward motion, pilots clear the tail in almost every case."

Hard to Swallow. A local newscaster on the Jap-controlled Radio Manila in autumn said:

"Now that no other lubrication is available, castor oil remains the only possible source of oil for all transport machines."

Different, Important. Geisha girls trained as aircraft-instrument inspectors were recently interviewed by the Japanese press. Most articulate of the comely patriots who had exchanged evening-dress for the Mompei uniform, was a Miss Sato. Formerly she had been famous for her stewing of samisen and pouring of saké. Now, according to Miss Sato, the geisha girls work a straight 8-4 shift instead of their former 5:30-2 A.M. schedule. "My present work is quite a bit different," she told reporters. "An important little cog in Japan's aircraft production machine," concluded her supervisor.



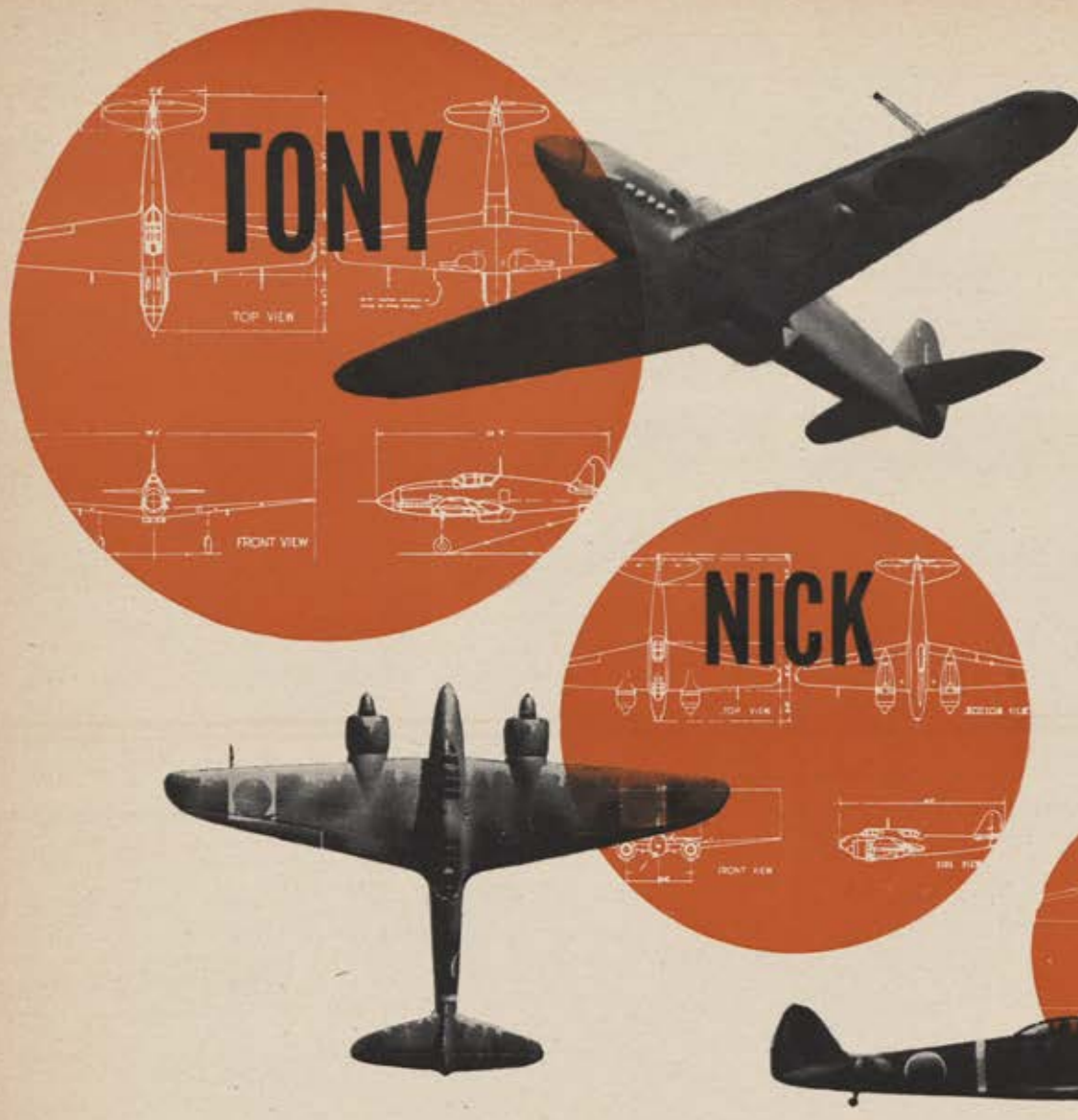
Open Season Continued. Booby-trap season never closes. Among Japanese devices for spreading sudden death, three adaptations of old principles have been noted. They follow a set of well-tried tricks; using familiar and unsuspecting objects, connecting explosives with an innocent bit of "nature," and planting destruction where human curiosity or souvenir hunting will set it off. The first gadget is simply a bar of soap, a widely advertised American floating brand, complete with trademark and manufacturer's name. Purpose: incendiary.

The second is a harmless looking coconut. It houses an adapted Type 97 hand grenade. The third has been given a complicated name, "Cloth Bag Demolition and Booby Trap Assembly." It is sure death for the man who tampers with it; besides, it can be attached as a delayed demolition charge on moving equipment.

Word War. Japanese and German propagandists, in big type and with sound effects, have done what they could to bring their messages up to date with the situation maps. Lt. Colonel Shozo Nakajima told a full dress press conference in Tokyo that the Superfortress raids were bagatelle bombing compared to the disaster of an earthquake. He reminded the newsmen that in the Great Kanta catastrophe of 1923, 270,000 of Tokyo's houses were razed, and thousands damaged. It would take 70,000 Superfortresses, he figured, to approximate that kind of damage. The Colonel studiously neglected to recall that "foreign" help was one solution to the 1923 disaster. Nor did he point out that now the United States is on the side of the earthquake.

. . . Front und Heimat has given the Germans a definition of two leading types of military cowards. "One kind," declares FUH, "tells civilians the most fearful stories. Apparently he is being hunted by hundreds of Soviet tanks which have just broken through the lines. In this way, he tries to camouflage his fear, explain his fright. The other type acts calm and prudent. He declares that things could be worse, probably, and that after all the Russians are not a very bad sort. . . ."

Tokyo newspapers have acquired what they called two "American documents." One purports to be a memorandum to B-29 crews, saying, "Drop bombs anywhere; come back quick." The other, quoted by Tsuchiura, Domei correspondent, gives Americans who may be shot down over Tokyo directions for "proceeding to American Headquarters in Tokyo." This worries Tsuchiura, who explains that there is nothing in Tokyo that can be described as American Headquarters. . . . Das Schwarze Korps, one of Germany's leading military periodicals, condemns civilian growlers who grumble at two-way evacuation. "When evacuees from the East meet evacuees from the West," concludes the SK, "space problems will not permit left-hand solutions. Relentlessness is demanded to break the stubbornness of those who complain. When a nation's life is at stake, one does not say what can or cannot be demanded." . . . Japanese newspapers and Radio Tokyo have collaborated on an announcement that it is the considered opinion of the Government that American propaganda leaflets are "absurd and ridiculous." . . . As for the Japanese Government, Tsuneo Kanamitsu, member of the Diet, got up courage to declare publicly its complex structure should be "courageously abolished." The Oriental solon had no intention of being ambiguous. ☆



Some flight facts and combat characteristics on three fighters of the Jap Army Air Forces

BY CAPT. W. H. CARTER

Chief, Foreign Equipment Unit, ATSC, Wright Field

The principal fighter opposition to our conquest of the Pacific islands has been provided by aircraft of the Japanese Navy. Their fighters include the Zeke 22, Zeke 32 (the Hamp), and the more recent Zeke 52. In the opinion of technical men who examined them, and pilots who fought them, these planes could not compare with our current fighters. Now, however, as we reach territory controlled by the Jap Army, we can expect to find Army planes which differ greatly from their opposite number in the Jap Navy.

The standard Army fighters, as exemplified by the Oscar Mark 2, Tony and Nick, reflect the Japanese attempt to make up for their original disadvantages. These planes have armor plate—a radical departure from early Jap aircraft—and they have heavier machine guns, more powerful engines and greater speed. Some have leak-proof tanks, another innovation for the Japs. They can turn better than anything we have at low speeds and outmaneuver and outclimb our best at low altitudes. Nevertheless, the opinion

of our experts remains the same: these Jap Army fighters have certain good characteristics, but for all around usefulness they are outclassed.

Take the Oscar Mark 2, for example. It is a single-engine fighter with a radial air cooled engine, a three bladed propeller and a top speed of about 345 mph at 20,000 feet. This speed does not compare with that of our fighter aircraft which are better by at least 50 mph at 20,000 feet and by about 70 mph at 25,000 feet.

However, the Oscar Mark 2 can climb faster than either the P-38G or the P-47C up to 15,000 feet, and faster than the P-51C between 5,000 and 20,000 feet. Something new has been added here, for previously Jap fighters lost their rate of climb advantage in the higher altitudes. At 5,000 feet, the Oscar Mark 2 goes up at over 3,000 feet per minute, and at 10,000 feet its rate of climb is about the same. At 15,000, it drops off to a bit over 2,500 fpm, but that is still slightly better than the P-38G, and still better than the P-47D.

Furthermore, there is the fact that the Oscar Mark 2 is the most maneuverable of all the present Jap fighter planes. American pilots who have tried to turn with the Zeke 52

(Continued on Page 60)



"... crouched over his
bombsight, counting off
the seconds..."

ILLUSTRATED BY CAPT. RAYMOND CREEKMORE

From Kansas to Tokyo

BY MAJ. MILTON R. KRIMS

AIR FORCE Overseas Staff

This is the story of how one B-29 and its crew became operational. It could be the story of many B-29s and many crews now hitting Japan.

The Superfort grew up somewhere in Kansas. In another part of Kansas, at practically the same time, 11 men were learning to become its crew. First there was the airplane commander, a West Point graduate, class of '43. His name was Capt. Russell J. Smith. Three corporals were added as gunners: Edward Zita in the right blister, Charles E. Boland in the left blister, and Joseph P. Bohan in the tail. Later were added 2nd Lt. Robert Dean as copilot, 1st Lt. Carlyle E. Schnelle as bombardier, 2nd Lt. James E. McLain as navigator, 2nd Lt. Raymond Yeager as special equipment operator, Cpl. Sam Schulman as radio operator, Cpl. Boyd Mericle as central fire control operator, Cpl. Hayden F. Washington as flight engineer.

This was the crew. They flew navigation missions to Cuba and Puerto Rico. Once they lost an engine about an hour out of Puerto Rico, and got back with a new confidence. They went to a B-29 plant, watched an airplane being built. But always they wanted a plane of their own. Even when they began processing for overseas duty—straggling from office to office making out papers, getting sore arms from shots, kidding about infectious diseases—they still didn't have their own plane.

Then one day their airplane was sitting on the ramp. Separately, they wandered down to admire the shiny new B-29. One by one they went inside, handled controls and guns and instruments, each man especially concerned with the tools of his job.

When the time came for the overseas hop, take-off was delayed by a leak in the relief valve to the deboosters.

The story of a B-29 and its crew, from a training field in Kansas to a Marianas base; then their first mission—Tokyo at low-level

Standing around on a cold, windy morning, waiting for the valve to be replaced, they grumbled about it being a hell of a way to get started.

The seven-hour flight from Kansas to Mather Field, Calif., Port of Aerial Embarkation, was routine except that No. 1 engine carburetor acted up, making it necessary to operate on auto rich most of the time. At Mather the maintenance boys installed a new carburetor and, while they were at it, replaced a cracked glass in the bombardier's pane.

The schedule was rigid at Mather—checking and processing, briefing on everything from navigation to tropical diseases. And they had time to wonder about their B-29. The flight engineer wasn't at all sure about the wisdom of keeping cowl flaps closed down to within temperature tolerance; he'd always believed a reasonably low cylinder head temperature was easier on the engines. But he appreciated the cruise control charts. Time and again he'd been told that if he adhered to their established requirements, he would get maximum efficiency with minimum fuel consumption. The plane had been washed and steam-cleaned at Mather, and they wondered how many mph this would add to the previous speed.

From the time they left Mather to arrival in Hawaii, the radio operator, navigator and engineers were constantly busy; pilot or copilot occasionally adjusted the turn control on the automatic pilot to correct a tendency to drift to the right. The navigator was determined to find Hawaii on no more than three readings. The airplane commander, the group flight engineer, 1st Lt. John L. Stevens, who was flying with them as a passenger, and the flight engineer were holding within the exact specifications of the cruise control charts and flight plan.

A perfect landing was made at John Rodgers Field in Hawaii. They felt better with a long overwater hop behind them.

On their way again, 43 hours later, there was a noticeable change in the crew. For one thing, they were no longer troubled by overwater flying, although Kwajalein was a landfall over 10 hours away. About 200 miles from Kwajalein, the navigator called for a slight change of direction. Then, once again, Lieutenant McLain called his shot. Kwajalein was straight ahead, a hairpin-shaped atoll, and the pilot brought them in with another perfect landing.

The next morning there was some trouble with the oil pressure gauge and the men were impatient, anxious to beat the noon deadline that would keep them another day on Kwajalein. Then at 1116 they took off for the last step on their journey to an island in the Marianas.

For the next six hours the men speculated about their future home, about living conditions, climate, but mainly they wondered about their first mission. When would they fly it? What would it be like? They felt ready for a mission and, thinking back, they tried to remember what they had learned on this journey. The navigator had learned to trust his instruments. He had flown day and night over water and he knew he had both the confidence and the tools to guide the airplane to any desired destination. The men knew that an airplane must be kept as clean as possible inside and out; washing and steamcleaning the plane

had added five to seven mph to their airspeed. The engineer was finally convinced he must run his engines at the indicated maximum temperatures. And pilots and engineers had proof that the airplane should be flown according to specification of the cruise control charts.

The voice of the navigator came over the intercom. "Navigator to pilot. You should be seeing that island any minute now."

It was only their second day in the Marianas when one of them said, "I came over here to fight and they've got me going to school again." The whole crew was annoyed. They had taken their plane across 6,000 miles of water and were ready to take her into combat and here they were in school—eight hours a day of it.

Maj. Gen. Curtis Lemay, Commanding General of the XXI Bomber Command, put it this way, "The idea that training days are over when a crew arrives in a combat zone



"... another day on Kwajalein."

is absolutely false. The basic training in the States is excellent, but it can't help but be a little behind because we learn new things every day over here and we can't possibly get the information back fast enough. Training continues right through combat operations, letting up only a little in direct ratio to the combat experience of the crew."

The crew of this B-29 went to school for 10 days. General Lemay gave their class its first lecture and introduced them to air discipline. He said crews must reach a point of proficiency where procedures become automatic, must become thoroughly at home over the target, know the way there and back as well as they knew the way to the mess hall, must learn to fly exactly as briefed.

On the fourth, sixth, eighth and tenth days of school they flew practice missions, and it felt good to get back to their plane. They dropped bombs on Jap-held islands, and the first time they returned a little disgruntled. They hadn't even hit the target. There were all the intricate problems of allowance for turn to be solved. They were flying new and very close formations. In the States they had paid little attention to fuel consumption.

They felt differently now about the training.

Lieutenant Schnelle, the bombardier, said, "High ballistic winds really present a problem. At home you've got an average wind of about 30 mph. It's not unusual, I'm told, to run into 150 to 200 mph winds over Japan."

Lieutenant Yeager, the special equipment operator, smiled happily. "One thing I like about this school. They explain my problems to the rest of the crew."

Added Lieutenant Dean, "They say copilots in the States

don't get enough chances to function as pilot. Here they expect us to get more time so we can lighten the load on the pilot. Suits me fine."

Lieutenant McLain, the navigator, said, "We're going to fly through all kinds of weather, fly doglegs to miss Jap islands. I got to be sure to get a fast reading as soon as we come out of an overcast. I got to make sure the pilot goes into the wind to make landfall. I got to worry about 180° wind shifts and constant altitudes on the way to the target and varying altitudes on the way back."

Precision instrument flying, almost split second timing, tight formations for perfect bomb patterns—these they found added up to air discipline. And these they thought of in terms of the first mission.

Then suddenly it came. March 8, 1945, was no different from any other day at first. They had planned to do some work on their huts, check the airplane. But they had no time for casual activities that day. Captain Smith was informed there would be a briefing for all crew members.

The briefing hut was overflowing into the white coral path. At the long end of the hut there were maps on the wall, maps of Tokyo. Smith and Dean and Schnelle and the others grinned a little; not bad—Tokyo. And then a quiet, unemotional voice was talking to them. "You will come over the target at an altitude of 5,000 feet." There was more, but for the moment that was enough. Their first mission—Tokyo—with the lowest stack at 5,000 feet.

Then they were suddenly very busy. Col. Carl R. Storrie, CO of their group, gathered them together for a talk. The colonel had a long record of combat in Europe and he spoke with the quiet assurance of a man who knows. They listened as he told them the tricks of flak evasion, warned them about making precision turns and maintaining altitude, told them how to evade fighters. There would be some 300 airplanes over the target and each must be in its assigned place at the proper time. If not, there would be air collisions as well as planes hit by friendly bombs. And wear amber glasses so as not to be blinded by lights and flak. Finally Colonel Storrie said, "And don't go for the Emperor's palace. It's not named as a target. There's only one place for your bombs to land and that's on your target. Good luck—I'll see you all tomorrow when we get back."

They talked excitedly as they left the briefing hut. "Holy hat . . . 5,000 feet . . . incendiaries . . . 5 to 7 tons of bombs in each airplane . . . and at least 300 airplanes."

After dinner, Captain Smith and the crew returned to the briefing hut. They wanted a man-to-man briefing. Never before had a B-29 been flown at such a low altitude over an enemy target. Quietly they studied the maps, reviewed their problem.

They slept late the next day, and they slept well. A late breakfast was arranged. There was a final air-sea rescue

briefing, a weather briefing. "Got a hack coming up," said Capt. Joe Byrtus. "Fifteen forty-four in thirty seconds." They bowed down over their watches. Five . . . four . . . three . . . two . . . one . . . hack."

Following a 1739 take-off, Captain Smith was guiding the plane carefully over the cliff that dropped abruptly into the blue sea. The intercom was busy. Schulman at his radio . . . Mericle, Zita, Bohan, Bolan at their gun positions . . . each had his own way of answering "RRRRodgeRRR." Somehow you always recognized them as soon as they spoke. The tenseness was gone.

Each man tested everything he could think of, tested it again. Gradually the chatter on the intercom died down and it became very quiet. The sun was setting, and it seemed the whole world was gradually turning gray. Then suddenly it was dark. All around, the darkness was crowded with airplanes. General Power, Colonel Storrie, Colonel Wheless, Lt. Colonels Mason, Martin and Strouse, Majors Baird and Evans, and others. The sky was full of rank flying with the men they commanded—and trained. As

Colonel Storrie said, "The only way I can pick my lead crews is to fly with them." He had flown every mission so far.

Time passed; gradually, the values of air discipline began to show. Maintain proper altitude and air-speed and you needn't worry about other airplanes nearby in the dark. Set power according

to the specifications of the cruise control charts and you needn't worry about running out of gas. Maintain a proper military organization in your crew and you knew everyone would function efficiently and calmly, quick to respond to every command. Everything seemed to be working as planned. Finally, quite incredibly, they began to feel as if this were just another flight.

It was getting pretty close now. They struggled into their flak suits. They put on their amber goggles. They seemed to be able to remember everything they had been told without even trying.

Yeager sighted land. McLain had guided the big airplane over 1,300 miles through darkness and changing weather and made landfall only 3 miles off course. Already, he was plotting the course away from the target.

The Japanese homeland was hidden under a perfect blackout. The weather, as predicted, was CAVU. They were over the I. P., turning into the axis of attack. Smith increased his airspeed and the airplane surged forward.

Suddenly, off a little to the right, there was an oblong of yellow flame. In another moment, it was crossed by another, forming a perfect X. The first incendiary bombs had been dropped on Tokyo. Colonel Storrie, flying with Captain Russell, was first in. Lt. Col. Gene Strouse, with Captain Douglas, crossed his bomb pattern.

A split second later, the darkness over Tokyo was cut by

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"We're going to fly through all kinds of weather."

Get Going, Gooney

It is always open season for "Gooney birds" on Ascension Island. The Captain shoots his Very pistol, the colored rockets scare the birds, and a safe path is opened for air traffic using this station.



Ascension's 35 square miles are covered with rocks, cinders, and volcanic lava.



The birds use Ascension as a nesting ground, creating a serious traffic hazard.

After an airfield had been carved out of Ascension Island, thousands of "Gooney birds" assembled on it and created an unusual problem. For five months each year it was extremely hazardous for planes to land or take-off after 1600 hours. All attempts to shoot the birds, smoke them out, or scare them away by dynamiting the ground failed. Then Maj. C. S. Chiles hit on the idea of firing Very pistol flares. That proved to be the answer. Now it is SOP for two men to stand near the end of a runway and shoot the flares. The birds are chased away long enough to keep the air traffic moving. ☆



Work goes on at the runways all the time. The labor is native and the methods are primitive, but together they do an important task.



Ghurkas, among the finest of native troops, load up for Mandalay.



This C-47 fuselage with thatched roof served well as base operations.

Natives are loading packages which will be dropped by parachutes.



BURMA



BY CAPT. L. P. BACHMANN
AIR FORCE Overseas Staff

Sometimes they landed at forward airstrips, often they dropped food and other supplies while still airborne. Some of the boys who had this latter job grew tired of being shot at as they circled over enemy lines to make a drop. To keep Jap heads down, they loaded 100-pound bombs along with cargo, and shoved them out between packages of food, ammunition and PX supplies.

All kinds of similar ingenuity were required in Burma; it was rugged for the Troop Carrier and other transport men who had the job of supplying our forward ground troops—they had to contend with enemy fire, the worst terrain in the world, topheavy schedules. But today we have Lashio, Mandalay—and the capital of Burma, Rangoon. The entire operation, all authorities agree, would have been impossible if ground troops had not been able to count on us for everything from tactical and strategic air support to deliveries of replacement troops.

The 10th Air Force, stripped down principally to fighters, L-planes, medium bombers and C-47s, was assigned to support the Northern Combat Area Command—composed of Chinese divisions plus the U.S. Mars Task Force which took Lashio—and the British 36th Division which approached Mandalay from the north. Matched with this organization was the Combat Cargo Task Force given the same job in support of the British 4th Corps in Central Burma.

The entire operation was really Allied, in the most jumbled sense of the word, with Indians and Chinese loading American planes assigned to resupply British troops—with RAF Dakotas carrying even chewing gum and an occasional can of beer to Americans on the road to Mandalay.

With cargo planes flying up to four missions a day and crews working often more than 17 hours per diem, the

AIR FORCE

Much of the credit for our successes in Burma belongs to the AAF and RAF men who helped supply our troops slogging through the jungles

REF

tonnage figures were terrific. Ground crews worked every night during the few hours of the 24 that the aircraft weren't actually airborne. Through their efforts more than 80 percent of all assigned aircraft were kept operational—despite impossible climate, weather and a baffling shortage of spare parts.

Actual packing of the cargoes was done by Air Cargo Resupply Squadrons composed of men newly assigned to the Air Force from Quartermaster, Infantry, Cavalry, Signal Corps and Merrill's Marauders. They had to separate and pack the supplies and then provide crews to fly with them and serve as kickers—actually shove the groceries out the doors of the planes. It's hard work, sometimes dangerous, and many of these non-rated men have accumulated more than 1,500 flying hours. Some of them have been lost through the open door when their plane took a sudden lurch; others have been hit by Jap bullets. One corporal

(Continued on Page 56)



Hot meals are brought to the squadrons who fly the combat cargos.



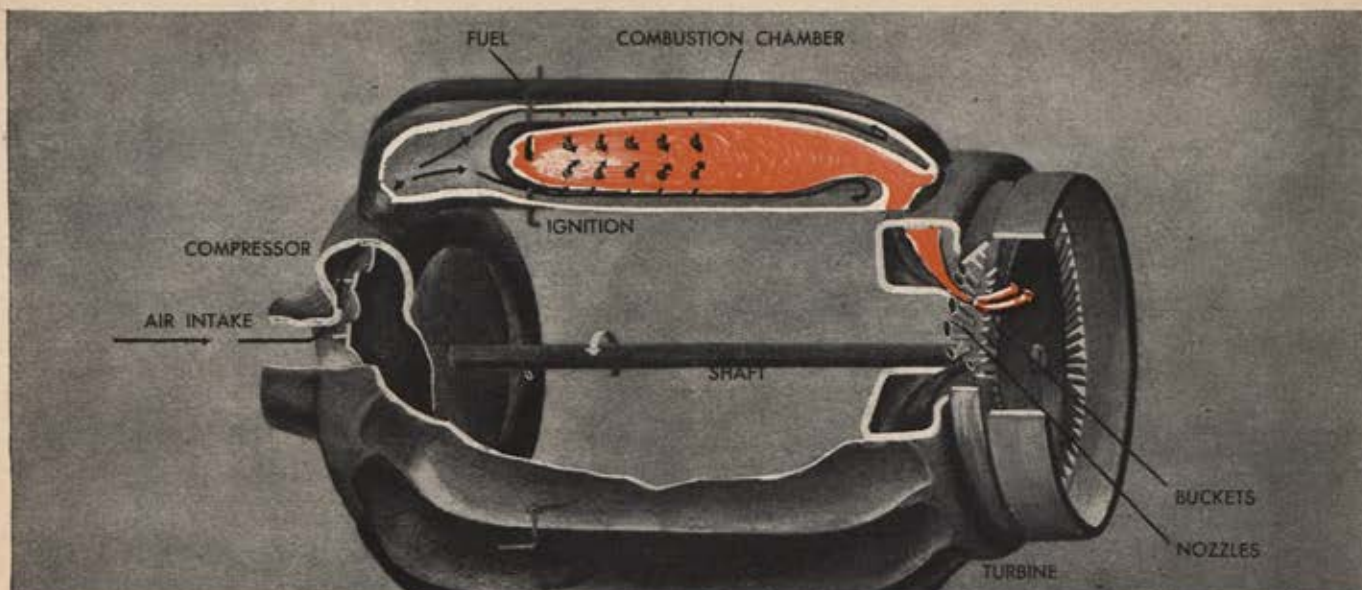
Each morning combined staffs meet to discuss next day's operations.



What looks like a crap game is really a study of briefing maps.

Loading and unloading of the C-46s is done by a British outfit of native Indians. Between work they cool off in this convenient pool.





Cutaway view shows operation of turbo-jet engine. Combustion of fuel-air mixture spins turbine which rotates compressor by means of shaft.

GROWING PAINS OF JET

BY MAJ. ROBERT V. GUELICH
Air Force Staff

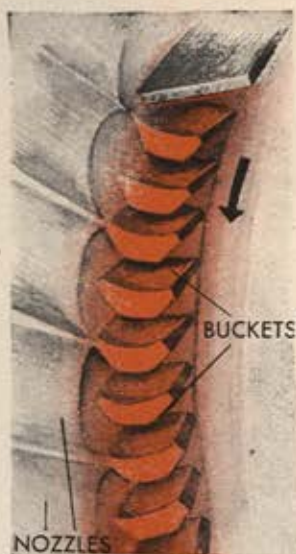
ILLUSTRATED BY CPL. MILTON J. WYNNE

In early March, 1939, Lt. P. H. Robey took a YB-17A up to 25,000 feet in a test run and clocked its speed at 311 mph. This was 100 mph faster than a B-17 had ever flown, even faster than any of our fighter aircraft had flown at that altitude. The test flight was an astounding performance for those days, but no one thought of it as a milestone in the development of jet propulsion in this country. Yet, indirectly, that's just what it was.

If that test flight had been unsuccessful, all orders for turbo-superchargers on B-17s would have been cancelled, for it was the turbo that produced the 100 mph margin in speed—and in early 1939 the turbo-supercharger definitely was on the spot. At the time of the flight, orders for turbos on B-17s had already been technically cancelled. The paper work had been initiated and forwarded to Washington. Boeing Aircraft and the AAF had lost faith in the turbo. For 20 years the AAF had struggled with the gadget only to have one disappointing flight test after another. The Robey test used a turbo that was equipped with a new regulator, the final hope for assuring reliable performance.

As soon as the B-17 rolled to a stop after the record-breaking flight, the telegraph wires to Washington began to sizzle. Headquarters read the test results, threw the cancellation papers in the waste basket and issued a directive that all AAF high altitude bombers should be equipped with turbo-superchargers from that date on.

The pendulum had swung and the turbo-supercharger had been saved from the junk pile. Significant? Look at the turbo's record in this war—its contributions to high altitude performance, its application not only on the B-17 but on planes like the B-24, B-29, P-38 and P-47.



Hottest part of the turbine are turbo-wheel buckets that receive blast of hot gases.

Rejuvenation of the AAF's turbo-supercharger program meant more than altitude superiority for our heavy bombers. It meant that development work on whirling red-hot gas turbine wheels had been given a new impetus. Key to the supercharger program had been the development of metals that could withstand the high temperature stresses of these turbine wheels. That's where jet propulsion comes in, for this also was the key to jet engine progress.

The turbo-supercharger and a turbo jet engine might be regarded as birds of a feather since they both convert hot gas into mechanical work through a turbine wheel. The difference is that the turbo jet generates its own heat and converts it into thrust while the turbo-supercharger depends on the conventional engine for its supply of hot exhaust gas and does not use it for primary jet thrust.

The turbine wheels of both must withstand very high temperatures under extreme centrifugal stress. Both drive compressors directly from the turbine wheel shaft. But the compressed air of the turbo-supercharger is ducted back to the carburetor of the conventional engine, to keep the engine operating at sea level horsepower while the compressed air of the turbo jet unit is ducted into a combustion chamber, where it is mixed with fuel and burned to produce the hot gas that turns the turbine wheel and then exhausts through the tail pipe to impart forward thrust.

Although the metallurgical problem connected with the turbine wheels had been licked to a great degree by the time the Robey test flight was made, it is anybody's guess as to what our jet engines might be capable of today had the turbo-supercharger program been abandoned in 1939. But to get the story we have to start at the beginning.

The jet engine developed in this country must withstand high temperatures and stresses of 34,000 times the weight of each turbine wheel bucket. To realize just what that means, consider that the internal combustion engine can be cooled to operate efficiently with metals that have to withstand temperatures of less than 600° F, and that its stresses are nothing like those common to the jet engine. The reason, of course, for the tough requirements peculiar to jet propulsion is that power of turbo jet engines is increased by increasing the combustion (hot gas) temperatures.

To harness these temperatures before the gas cools off, combustion chambers are placed as close to the turbine wheel as possible so that maximum amount of heat energy can be squirted against the turbine buckets. Therefore, the hotter the gas that strikes the buckets, the greater will be the efficiency of the engine. Although combustion temperatures can be raised to over 4,000° F, the fuel-air mixture in present turbo jet engines must be leaned out to burn at the top operating temperature limit of the alloys in the turbine buckets now being used.

Without such alloys we would be compelled to compromise on the efficiency of the jet engine, as did the Germans. In their Junkers 004 gas turbine engine (ME262), for example, the Germans utilized aircooling and specially coated metals to hold operating temperatures down to a 1,300° temperature range. They have to hold the heat down because the metals in the Junkers 004 won't stand up. This means a sacrifice in the efficiency of their jet engines.

For more than two decades America's leading industrial metallurgists have been concentrating their research on development of high temperature alloys that could withstand the stresses of hot turbine wheels. The search for high temperature alloys was stimulated primarily by the AAF development program of the turbo-supercharger. This program was kept alive by a handful of men who refused to lose faith when time after time the turbo-supercharger would overheat and throw its buckets out of the turbo-wheel. And these men knew the problems they were tackling in the turbo-supercharger were giving them the answers that would pave the way for successful development of an efficient gas turbo aircraft engine. But that is going a little ahead of our story.

Basic research in the hunt for high temperature alloys goes back to the last war and to Dr. Sanford A. Moss, gas turbine expert for the General Electric Company, one of the nation's largest turbine manufacturers. Dr. Moss designed a simple type of gas turbine to compress air for high altitude operation. This was the turbo-supercharger. Under the sponsorship of the National Advisory Committee for Aeronautics, Dr. Moss first had explored the operation of the 1917 turbo-supercharger of the Frenchman Rateau. Then Dr. Moss came through with the basic turbo-supercharger as the AAF knows it today.

First altitude test of this turbo was on top of Pike's Peak in the late summer of 1918. On a specially rigged dynamometer test stand, the turbo was hooked up with a 350 horsepower

Liberty engine. Altitude was 14,109. Without the turbo, the engine turned out only 230 horsepower, but with the turbo, sea level (356) horsepower was pulled from the engine. These results were encouraging enough to continue the experimentation program despite the dropping of most war projects with the signing of the Armistice.

One year later, in September 1919, the first successful flight test of the turbo-supercharger was made by Maj. R. W. Schroeder in a LaPere biplane. Up at 18,000 feet, the engine's coolant supply of water gave out, forcing Schroeder to glide back to earth and make a dead stick landing. Less than six months later, Schroeder successfully flew to 36,160 feet altitude, where his oxygen supply failed. His plane plummeted at the rate of 300 mph, but Schroeder regained consciousness and pulled out at 2,500 feet.

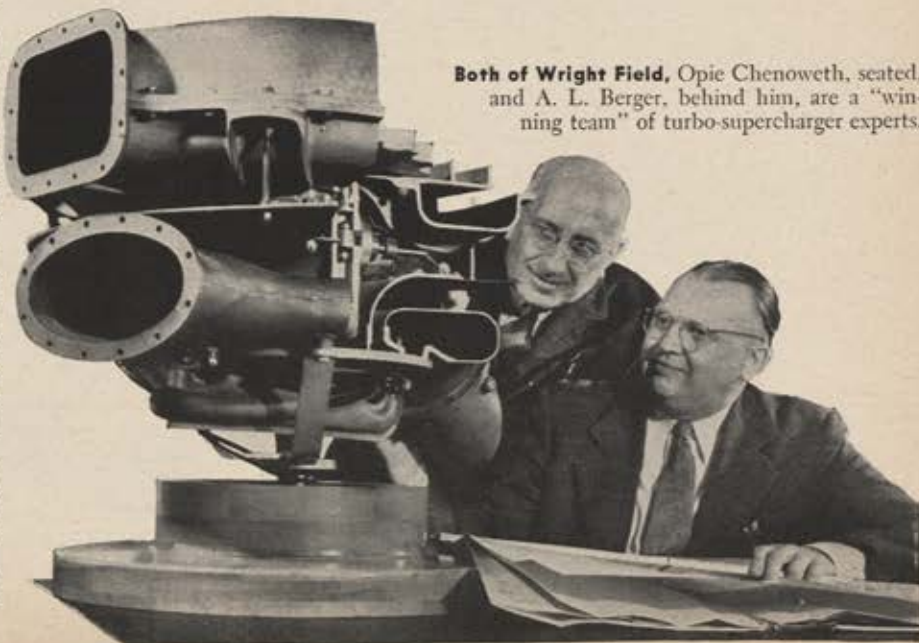
All of these flights were precarious because equipment had not yet been perfected for such altitudes, but the results of turbo performance were encouraging, although dwindling appropriations threatened to force abandonment of turbo-supercharger development.

Fortunately, the AAF had an ex-Army man by the name of A. L. Berger who had fallen in love with the turbo-supercharger. Convinced that every airplane should have one, "Doc" Berger began hooking the few available turbos onto everything that would fly. When the unit disintegrated in tests at high operating speeds and temperatures, Doc moved it from in back of the propeller to the side of the engine. Such compromise cooling methods, in the absence of high temperature metals, had to be adopted to make the turbo practical.

Parts being used were principally iron until the introduction in 1922 of Silchrome No. 1, a chrome-nickel-molybdenum alloy that could withstand high stresses at temperatures over 1,100° F. This was used for the turbine

(Continued on Page 56)

Development of metal alloys that could withstand the high temperature stresses of the turbo-supercharger's hot turbine wheels solved a basic jet engine problem



Both of Wright Field, Opie Chenoweth, seated, and A. L. Berger, behind him, are a "winning team" of turbo-supercharger experts.

FROM KANSAS TO TOKYO

(Continued from Page 20)

daggers of searchlights. They sliced up and down, searching the high altitudes for airplanes that were thousands of feet lower. They slashed across the sky, came closer.

Smith looked straight ahead, never deviating from course. Bob Dean leaned a little to the left, watching, adjusting altitude. Schnelle crouched over his bombsight, counting off the seconds on his stop watch. There were four bursts of flak near the tail, some heavy flak ahead, low, inaccurate. But the searchlights were coming closer. Washington never turned from his instrument panel.

Another oblong of flame spread over a part of Tokyo. And at the same time light from a searchlight flooded the cockpit. All of a sudden it went out . . . and a few moments later an airplane spouting a tail of blue flame shot past and up at a terrific speed. No searchlight picked them up again; only once had been enough to teach Smith how to avoid them. The flak improved as they made their turn around and away from the target. Bohan, in the tail, spoke very steadily. "Night fighter coming in at six o'clock." They waited for the burst of fire, their guns tracking him as he came within range. The Jap veered off. To the right, a B-29 was coned in a pyramid of searchlights. Somehow, they forgot their own danger, begged for her release. A great ball of fire plunged towards them, then dipped under them. A B-29 burns big at night.

The searchlights ringing the city frantically searched the sky. Ack ack ran in yellow and red and white bursts in desperate pursuit of targets. And through this pattern flew some 300 B-29s, each maintaining a planned course, speed and altitude.

They were away from the target now, looking back at the growing fire that was sending a faint streak of red to thin clouds 10,000 feet above. They watched sudden bursts of new fire added to the old. And even as distance made the fire grow smaller, a great plume of black smoke grew higher and higher over the city.

It was a beautiful fire.

They chattered over the intercom, excited now by the spectacle below and behind. But they were still over Japanese land and they were abruptly quiet when Zita broke in with, "Flak below." A few moments later Boland called, "Night fighter coming in at four o'clock." Smith called for auto rich. Seconds passed and they were like hours. "The crazy guy is blinking his lights," said Boland.

Mericle's voice was a little bored. "Two bits says there's another fighter at about five o'clock." There was. The one blinking his lights was probably acting as a decoy, trying to draw fire so the other could shoot into the blaze of the B-29s guns. There was no shooting. The Japs went away, probably thoroughly annoyed at the unwillingness of the stupid Americans to fall into a trap.

So at last they were on the way home from their first mission. Neither the airplane nor its crew had been hit. But it was a long way home over nothing but water. Smith checked McLain, got the course. Then he checked with the flight engineer. Gas? Hell, they had plenty of gas to get home. In fact, their fuel consumption had been a little less than predicted in the cruise control charts.

For a while they chatted among themselves.

Then it became very quiet, and there was only the roar of the four engines taking them home. Hours passed. The clouds began to turn grey with the first light, then a brilliant white as they were touched by the morning sun.

Bob Dean looked at the light and said, "This is the most beautiful morning I've ever seen." ☆



This Navy aircraft carrier was made into a floating Army airfield when it brought the Mustangs from Hawaii to Crote Bay, Guam, in February.



A P-51 is unloaded from a pontoon lighter at Guam. From there it was flown to Saipan, then to Iwo Jima where it went right into the battle.

"Park your car, bub?" At East Field, Saipan, a seven-ton D-4 "cat" clears away the jungle to provide ample parking space for the Mustang.



PACIFIC DEBUT



When our "Sleeper" plane, the P-51 Mustang, was introduced for the first time in the Pacific, the Japs apparently mistook it for their Tony fighter. This little recognition blunder resulted in one of the most spectacular individual aerial accomplishments in the Pacific war. It happened in northern Luzon, when Capt. William A. Shomo, commanding officer of a P-51 tactical reconnaissance squadron, and his wingman, 2nd Lt. Paul M. Lipscomb, spotted a Jap Betty escorted by 11 Tonys and a Tojo. The two AAF pilots eased up to them without arousing suspicion, and shot down five Tonys before the remaining Jap planes even broke formation. In three sweeps, Captain Shomo knocked off six Tonys and the Betty; Lieutenant Lipscomb, in a couple of passes, got three more Tonys.

There are several reports of unsuspecting Jap pilots waving in a friendly fashion just before being shot down by a P-51. It was a good game while it lasted, but the Jap finally caught on. This costly recognition mistake is the reason announcement of the Mustang in the Pacific was held up several months.

Early in April, long-range P-51s from Iwo gave Tokyo spotters a new recognition problem—and the Jap aerial defenders a new combat hazard—by flying escort to Marianas-based B-29s in a strike against the island capital. Jap reaction was less than enthusiastic as the P-51s strafed ground targets. ☆



These Mustangs get practise run over Saipan before they are moved up to the fighting at Iwo.



The second P-51 to land at Iwo hit a soft spot in the airstrip. Mechs start repairing damage.

YOU'RE THE UMPIRE



BY MAJ. ALFRED FLEISHMAN

Office of the Air Surgeon

S/Sgt. Dave Arcie, looking up from his Army hospital bed at Oran, watched every expression on the faces of the medics. He couldn't hear what they said, but he knew their decision meant whether he spent the rest of his life with one leg or with two. To him it meant the difference between being a whole man or no man at all. There was no in-between.

For weeks his leg had been in a cast, ever since they pulled him out of the ball-turret of the B-24, back from a raid over Romania, with his leg full of flak.

One of the medical officers came over to Dave's bed. "Sergeant," he said, "We've done everything we can, tried everything we knew, but I'm afraid we must amputate your leg. If we don't do it right away, infection may spread and that would make matters considerably worse. We'll save as much of your leg as possible . . ."

The doctor was kind, he was sympathetic, he was re-

assuring. But no matter how you dress it up, letting a man know one of his legs has to be cut off is no pleasant job.

The sergeant begged the medical officers to wait a little longer. Maybe the leg would heal after awhile. Maybe something might happen and it wouldn't have to come off. But the doctor shook his head.

Sergeant Arcie's leg was amputated a few inches below the knee. From a medical point of view it might have been worse, much worse, but they couldn't make Dave believe it. "I'm a cripple and I know it," he kept mumbling over and

over. When they told him he could still do a lot with what he had left, he just stared. It was as if the medics had amputated his spirit. Dave was a concrete mixer before he joined up to be a gunner in the Air Forces. You can't mix concrete with only one leg—that's all he knew.

They shifted him from one hospital to another, finally to a large Army medical



center back in the States. Here he learned how to get around on crutches, but he had no interest, no spark. What they told him were just words. He could do a lot of things, they said. But it didn't register.

One day they told him he was ready to be fitted with



Sports and games play a big part in AAF Rehabilitation, but the big contest is the patient vs. himself, with the outcome dependent on his own decision

an artificial limb. Sergeant Arcie wasn't interested. "I'm a cripple and I know it," he said. "Might as well walk on crutches, I'm getting used to them." But the doctors kept working on Dave Arcie, and reluctantly he agreed to give it a trial.

When Dave had learned to walk with his artificial limb, he was sent to an AAF Convalescent Hospital. It wasn't bad, and everybody treated him fine—but what the hell! He saw the big gymnasium and the athletic fields, but he couldn't see them for him. Then one day they took him up to the 70-yard circular track in the gym. He thought they were just going to show him the works. When the PT officer told him he was supposed to run around that track, he couldn't believe it. "This guy must be nuts," Dave thought. "Run!" he said. "Hell, I've got all I can do to walk! Look." And he proved it with a demonstration of his heavy limp.

The PT officer wasn't impressed. "C'mon, we'll show you a few tricks." Well, Dave figured, he was still in the Army, and when the Army makes up its mind there's no use trying to buck it, let alone trying to figure it out.

They went to work on Dave. Here's how you use your hip to get the most out of it; here's how you follow through; this is the way to get better balance; take these exercises for your hips; your legs; your stomach; swim; learn to golf; bowl; play ping-pong.

Didn't the damn fools know he was a cripple?

Dave finally made it around the circular track in 114 seconds. When they had him post his time next to his name on a board, he studied the board, a sort of racing form and saw that many others no better off than he had started about the same way and gradually had cut their time down. That 114 seconds began to bother him.

In a few days he was ready to try again. When he found he could lop off a few seconds from his previous record, he really went to work on it, even got excited about it. Not that he felt he would ever be any good, but it was a kind of challenge. Those figures on the scoreboard got under his skin. As Dave began to cut his running time down, something began to happen to him. He perked up a little, began to haul other guys over to the score board to show them how he was doing. He even got a few of them to race against him.

Soon Dave found he could shake a pretty good leg at badminton, even tennis, could bowl a better than average game. He began to laugh again. His spirit went up as his track time went down. One day he hit 16 seconds for the 70 yards.

Sgt. Dave Arcie was no longer a "cripple." The word wasn't in his vocabulary. No man who can run, bowl, swim, play golf, badminton, tennis, volleyball, baseball, pitch horseshoes, is a cripple.

Medical science had done everything possible for Dave Arcie, but it remained for Dave to help himself. He had to

play a big part, the final part in his own recovery. Athletics and recreation had helped him regain his spirit, had provided him with the means by which he could recapture the group feeling he needed so badly.

There are plenty others like him.

1st Lt. Carl Watkins was a pilot who had flown over the hump in China more times than he liked to count. On one of the trips the plane caught fire and blew up. Watkins hurtled down to earth from 500 feet with no parachute; the rest of the crew had been killed in the explosion.

Lieutenant Watkins had a broken back, two broken legs and was badly burned. When, months later, the doctors had completed an excellent repair job on the lieutenant, they shipped him to an AAF Convalescent Hospital. When he arrived his back was stiff; he didn't have enough strength to carry a bag. Bending down was out of the question. He didn't think he could ever do it again. At the hospital Watkins didn't care much about anybody and didn't think anybody cared much about him. Just let him alone, that's all he asked.

It was difficult for the hospital staff to get Watkins interested in anything. He was becoming one of those borderline discipline cases that the CO doesn't quite know what to do with. The PT boys found out that Watkins showed a fair interest in swimming. They started with that, got him in the water. He made 20 yards the first time out, then asked for help to be pulled out of the water.

But now he, too, had a record. The spark was there. It was easier to get the lieutenant back in the water the second time. The third time was still easier. The fourth time he went himself, for now he could see his own improvement.

One day 1st Lt. Carl Watkins raced up and down the pool against time for 240 yards. By this time he could do 25 sit-ups, could bend down and come up 10 times with a 10-pound weight on his neck. Reviewing these accomplishments, he began to wonder what the hell he was doing in a hospital. He walked out carrying 45 pounds of baggage.

Sgt. Joe Harlan was a gunner who had a pretty rough time of it overseas. He flew 47 missions in one of those planes to which flak and machine gun bullets seemed abnormally attracted. On almost every mission they were hit. He saw his friends go down all around him—and most of





the time no parachutes could be seen to open. On several occasions men were taken out of his plane who would never fly again. They were dead.

Finally he couldn't take any more. They sent him back to an AAF Convalescent Hospital in the States. He was nervous, jumpy, full of tension. He seemed to remember everything that

had happened, and at night it all reappeared in vivid detail. In the convalescent hospital he wanted only to go off by himself in a corner. When he talked, which was seldom, he had trouble with his speech and stuttered considerably. He made no bones about letting people know that he didn't want to be bothered.

The psychiatrists worked with him and he gradually showed signs of improvement. But his tenseness and stuttering remained. The personal physician, to whom he was assigned, thought he ought to play. He was persuaded to get on a volleyball team. Harlan played without interest at first. His timing was bad, his coordination practically non-existent. Often he found himself swatting at the ball after it had already gone over the net.

But when his team lost, Harlan didn't like it and he worked harder trying to improve his own game, finally began to make a few scores himself. Soon he reached the yelling stage. "Sock that ball, sock it, hit it!" He could be heard a city block away. When he played, he found the stuttering almost gone. When he was hard at it, he could yell and speak without stuttering at all. His improvement in the game became noticeable—so did his spirit. He seemed to have taken a new lease on life, became more sociable, could sit around with the rest of the fellows instead of going over in a corner by himself.

T/Sgt. Walter Werne was a top turret gunner, shot down on his 51st mission. He was sent back to the States, to an AAF Convalescent Hospital, with no visible scars but full of tension, shakes and tremors. He was hostile to the point of being almost violent when any one got in his way. When you could get him in a corner to talk, his conversation was full of gripes. The Army this, the Army that, what a raw deal he got and what a soft life the civilians who "sat out the war" had. Werne made it plain to everyone, including his personal physician, that from now on he was a passenger and was riding free on the merry-go-round. As long as he was going to be nervous

all his life, according to his own reasoning and diagnosis, there wasn't much use in doing anything except just sit and be nervous.

Getting Werne interested in anything seemed like an impossible job. But the doctors didn't give up. He stood 6 feet 2 inches in his stocking feet and the PT boys thought he might make a good basketball player. They quizzed him on it and found that back in high school he used to jump center. Well, a center was just what they were looking for. Werne figured it was a gag, but he'd go along with it. He broke into the line-up and within a few minutes, in spite of himself, was working like hell trying to score, block, pass and generally be all over the court at the same time. When the game was over he could hardly talk. It wasn't from lack of desire, but because he had yelled himself hoarse.

Sergeant Werne didn't work out his trouble right away, but when the writer saw him last he was well on his way and was constantly on the lookout for men with the same type of troubles he had had and was yanking them into the game.

Sports and recreation do not replace medicine, far from it. But they do play an important part in eventually motivating a man to get well under his own power. What is there about competition either between others or within the man himself that relieves tension, strain and uncertainty?

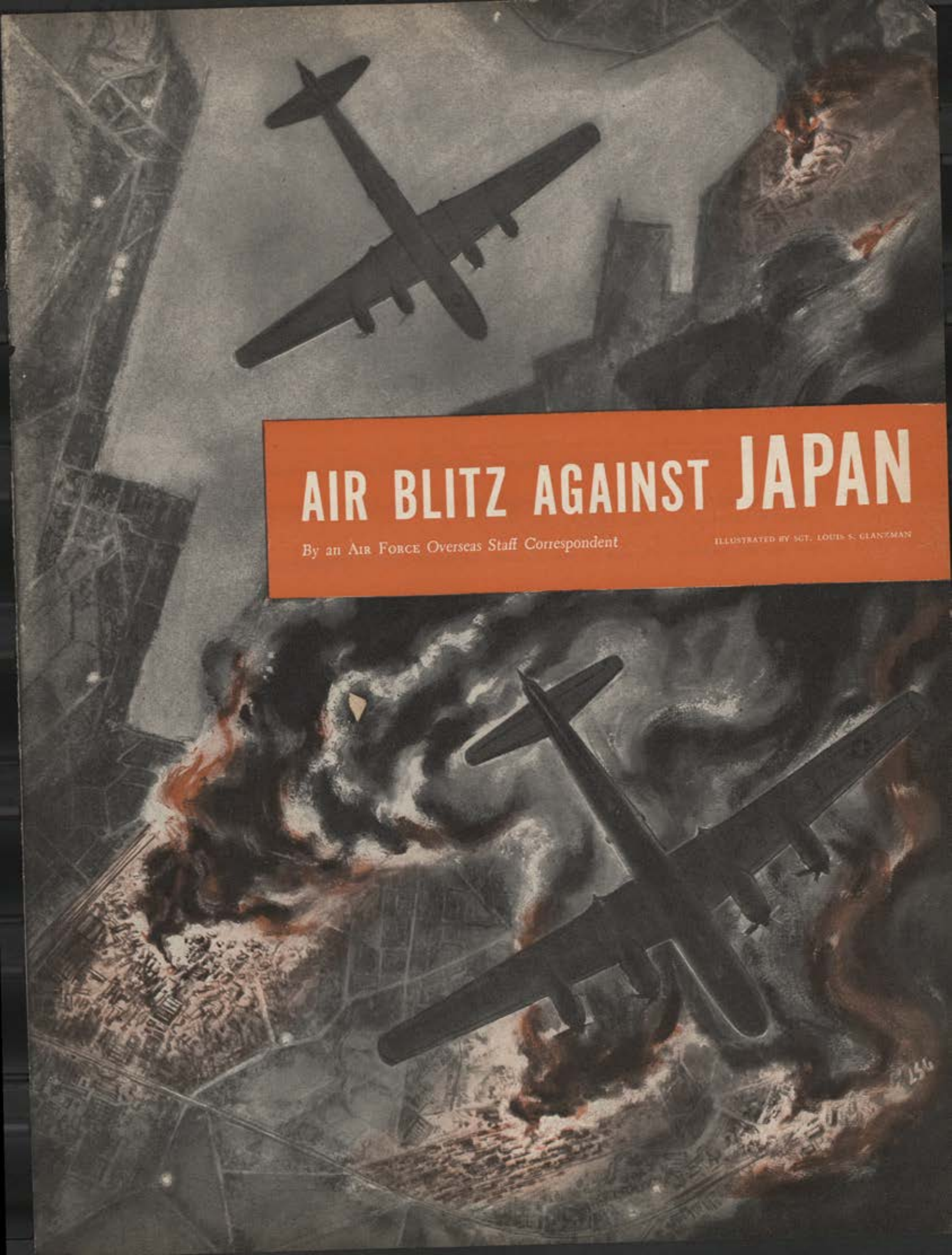
Let's go back a little. Throughout his training in the Air Forces, the aircrewman has been imbued with a "team spirit." During the process of welding him into a fighting group, he found a loyalty to his fellows that stood him in good stead. They trained together, flew together, fought together.

When one of the gang got hurt or sick, necessitating his removal from the outfit, almost immediately he began to feel a decided loss. He didn't belong anymore and his dependency on the group was brought home for the first time. He might be with a lot of other men, but he still felt alone.

This group feeling must be replaced and, in the process, a man's sense of proportion and balance restored.

When airmen feel that they can play together again, are still part of the team, belong to the group which looks to them for a contribution, then they know they can work together once more—and that's what AAF rehabilitation is designed to do. ☆





AIR BLITZ AGAINST JAPAN

By an AIR FORCE Overseas Staff Correspondent

ILLUSTRATED BY SGT. LOUIS S. GLANTZMAN

The real aerial blitz against industrial Japan began in early March with a series of low level attacks that also marked a revolutionary change in the tactics and employment of our B-29s in the Pacific.

For six weeks preceding March 9th, B-29s of the 21st Bomber Command, flying at 25,000 to 30,000 feet, had been running into adverse cloud conditions and winds of from 120 to 180 knots an hour. In those six weeks it had been difficult to judge visually the results because altitude and clouds made visibility poor. This uncertainty indicated the wisdom of deviating from the established operating procedure of high altitude bombing.

Many long hours were spent considering the various problems. First, low level would offer weather advantages: winds would vary between 25 and 35 knots, lessening the problem of excessive drift on bombing approaches. Cloud conditions were bound to be better. There would be less strain on the engines, thus simplifying maintenance problems. Perhaps most important, low level attacks by eliminating climbs to extreme altitudes would decrease fuel consumption, thus permitting greater bomb loads. On the other hand, bombing at lower altitudes also would give the enemy certain defensive advantages, if he was prepared to exploit them. There would be the danger of more accurate antiaircraft fire, more extensive fighter opposition. These, in turn, presented the question: should the strikes be at night or in the day time?

Then there was the problem presented by the physical makeup of the target areas—Tokyo, Nagoya, Osaka, Kobe. Collectively, these contained a preponderance of Japan's most important war industries. Here were the factories making the weapons, equipment and supplies needed by the Japanese to carry on the war. Here were the ships, shipyards and the railroad facilities, the warehouses containing raw and finished material.

The significant aspect of these cities—as seen from the air—was the solid mass of one and two story houses, over 90 percent flimsy wooden structures, with only a relatively small proportion of multi-storied modern buildings. Inside these small houses were unknown thousands of little shops, the “invisible industries,” all selling their products to factories on a piece-work basis. For example, former toy shops were finishing and assembling engine components; former household cutlery shops were producing components for precision instruments. There were also many “shadow plants,” small enterprises clustered around larger factories and serving as added sources of production. In 1939 Tokyo alone had 15,000 such shadow plants, each employing five or more persons. These invisible industries and shadow plants, dispersed through large cities, presented almost impossible individual targets. Only by widespread fires could they effectively be destroyed.

After careful analysis, it was decided to make a low level incendiary night strike against the most densely populated area of Tokyo. One of the most important contributing factors of this decision was its great element of surprise. The Japanese seem to have little resiliency; when they establish a defensive doctrine they appear slow to change it. If the Tokyo strike should be successful, Nagoya, Kobe and Osaka would be hit in rapid succession on alternate nights. It was a daring plan, calling for maximum effort and maximum courage.

On March 9th, the Superforts of three wings of the 21st



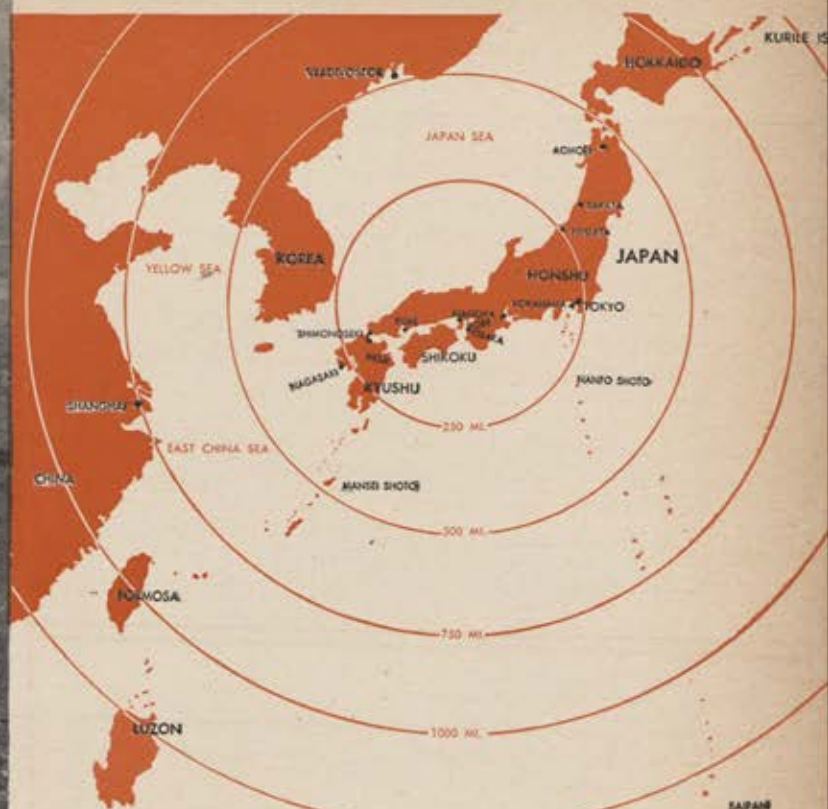
The decision was that widespread fire could paralyze Japan's power industries. B-29s of the 21st Bomber Command went in and



B-29 bombstrike on Tokyo. Twelve hours later fires had burned out area of 15.8 square miles. Incendiary bombs were dropped.



Powerful hidden and "shadow"
did the job at low level



Bomber Command were on their way to Tokyo. It was a good night; the weather excellent. The target was a highly congested rectangular area, approximately 10 square miles, with a population density of 103,000 people per square mile, perhaps the highest in the world.

Tokyo, one of the world's three largest cities, had a population in 1940 of about 7,000,000. Also Japan's leading industrial city, it contained such key war industries as machines and machine tools, electronics and precision instruments, petroleum, aircraft and aircraft parts. It was the terminus of practically all the main railroads on the island of Honshu, as well as the administrative seat of government and of the great industrial concerns comprising Japan's war machine. The target area included such vital centers as the Joban, Ueno and Central Tokyo railroad stations, the Marunouchi Telephone Exchange, whose lines go out to all parts of the nation, governmental districts, and the Army and Navy administrative planning headquarters.

From the moment the lead airplanes came over the target, the mission was intensely dramatic.

Japanese searchlights combed the sky at the expected altitudes. The first two airplanes dropped their bombs to form a perfect, blazing X. Two hundred and seventy-seven B-29s followed to spread that X into one of the greatest fires in history. Flak was spotty, light and inaccurate to accurate and intense. Automatic weapons' fire was low, and heavy gun fire was mostly high. Night fighters were timid, kept away. Apparently the magnitude of the defensive problem was too much for the Japs.

The flames, started in the northeast section of the target area, were fanned over the area by a 20-knot wind. Twelve hours later, fires had burned an area of 15.8 square miles. Less than 15 percent of the area escaped destruction.

There is no way of knowing exactly how much of Tokyo's invisible industry was destroyed. What is known makes an interesting list, much too long to be itemized here.

Photo reconnaissance indicated the Kanegafuchi Aircraft Parts Plant was severely damaged, Japan Machine Industry destroyed, as were the Tokyo Gas Co., Nippon Electric Wire and Cable Co., Nisso Steel Co., Sakurada Engineer-

ing Works, Rising Sun Petroleum Terminal, Oriental Weaving Co., Shiodome Freight Yards, Susaki Dockyards of the Ishikawajima Shipbuilding Co. A good target severely damaged was the Steam Engine and Rolling Stock Manufacturing Co., producing freight cars and rolling equipment known to be critical items in the Japanese economy. The Army Provisions Depot was destroyed. The great Tsukiji market and wholesale warehouse, most important wholesale food outlet in the area, was practically destroyed. To repeat, these were only a few of the plants destroyed. At this time there is no absolute way of reducing to statistical terms the millions of man hours lost to Japanese industry.

The Japanese were given no time to rest. Two nights later, Nagoya was hit by nearly 300 B-29s. The target area was a triangle three miles long on each side. Population density in this area ranged up to 75,000 per square mile. Nagoya was one of the three largest industrial areas in Japan, and was believed to be the largest center of Nippon's aircraft industry. It was estimated that 25 percent of the population was engaged in some phase of aircraft production. Here, too, the Japanese system of household industry and shadow plants prevailed. In addition to aircraft, Nagoya industry produced machine tools, bearings, railway equipment, metal alloys, motor vehicles and processed foods.

This concentration of 40 to 50 percent of Japanese production of aircraft and combat aircraft engines merited a maximum dispersion of destruction.

Ack ack and searchlights were somewhat better here than at Tokyo. The B-29 crews reported phosphorous bombs and strange green balls floating down from about 6,000 feet. Evidently the Japs were beginning to open their defensive book a little, but it seemed to reveal no successful weapons. The Aichi Aircraft Works, Atsuta Factory of Nagoya, Daido Electrical Steel, Nissan Chemical Plant, Hokoku Machinery Co., and Sumitomo Light Metals Plant were among the important installations damaged.

Osaka was next. The target area was about 10 square miles. Prior to the present war, Osaka had grown to one of the most important industrial cities in the Far East. Here also were the household workshops and shadow factories, perhaps more densely concentrated than in any other city in the world. Osaka was noted for its heavy industry which included shipbuilding, iron, steel and rolling stock works, as well as nonferrous metal enterprises, specifically copper and aluminum. It also produced aircraft propellers and governors, munitions and ordnance, textiles, special steels, electrical equipment, instruments, machine tools, anti-friction bearings. It was the third port of Japan.

On the 14th of March, nearly 300 B-29s carried 1,733 tons of incendiary bombs to Osaka, delivered from 5,000 to 9,000 feet. Once again, enemy defenses were ineffective. Total damage to the enemy amounted to 8.1 square miles. Heavy industry was hard hit. Among the plants put out of business, either permanently or temporarily, were the Kubota Iron and Machinery Works, the Kujo Power Plant, the Osaka Gas Co., Nakayama Steel Mfg. Co., Kurimoto Iron Works, Osaka Metal Industry Co., and the Hatsudoki Engine Works.

Early on the morning of the 17th, Kobe heard the air raid warning signals. It must have seen the fires of Osaka three nights before. It must have known what to expect. It was Japan's sixth largest city, its principal port. Here also was Japan's largest concentration of shipbuilding and marine engine plants. Here the Sanyo main rail line from Shin-osaka at the western tip of Honshu joined the Takaido main line west of Osaka and Tokyo. A national highway ran through the center of the city. There were also steel,

railway equipment, machinery, rubber and ordnance plants, all closely integrated with Kobe's transportation activities.

Over three-hundred B-29s dropped 2,328 tons of incendiaries on the urban area of Kobe. They burned a total of 2.91 square miles. There were many night fighters seen, but the few attacks made were unaggressive or poorly executed. The Kawasaki and Mitsubishi heavy industry areas were still obscured by smoke two days after the strike.

It was as if a vast, fiery tidal wave was sweeping across the great cities of Japan. There was no hiding from it, no stopping it. For the Japanese there was only the hope it would burn itself out.

Early on the morning of the 19th, the wave of fire struck Nagoya again, engulfing areas and plants previously damaged but not destroyed. The Japanese radio confidently had predicted the time of night the next mission would strike, but the B-29s struck later than usual, once again confusing the Jap defenses. Over two-hundred B-29s dropped 1,858 tons of incendiaries. Total damage to Nagoya was now five square miles. The Tokyo Cotton Mills, Yamada Engineering Works and many light industries were added to the list of industrial casualties.

In a series of five missions, the B-29s of the 21st Bomber Command had destroyed 887,855,000 square feet, or 31.81 square miles of Japan's four most important cities.

What made it possible?

First, daring and intelligent planning based on a thorough knowledge of the B-29 as an offensive weapon, and a complete study of the defects inherent in the Japanese industrial machine. Second, well trained combat crews with the courage and stamina to maintain the momentum of maximum effort. Third, the extraordinary achievement of the maintenance personnel.

With regard to the combat crews, collectively they flew a total of 4,225,000 miles, each aircraft averaging 60.5 combat hours. Each crew averaged 45.5 combat hours. Concurrently, some 30 weather and reconnaissance missions were flown. In lowering the altitude from 25,000 to 4,900 to 5,900 feet, the B-29s were subjected to greater danger from fighters and ack-ack.

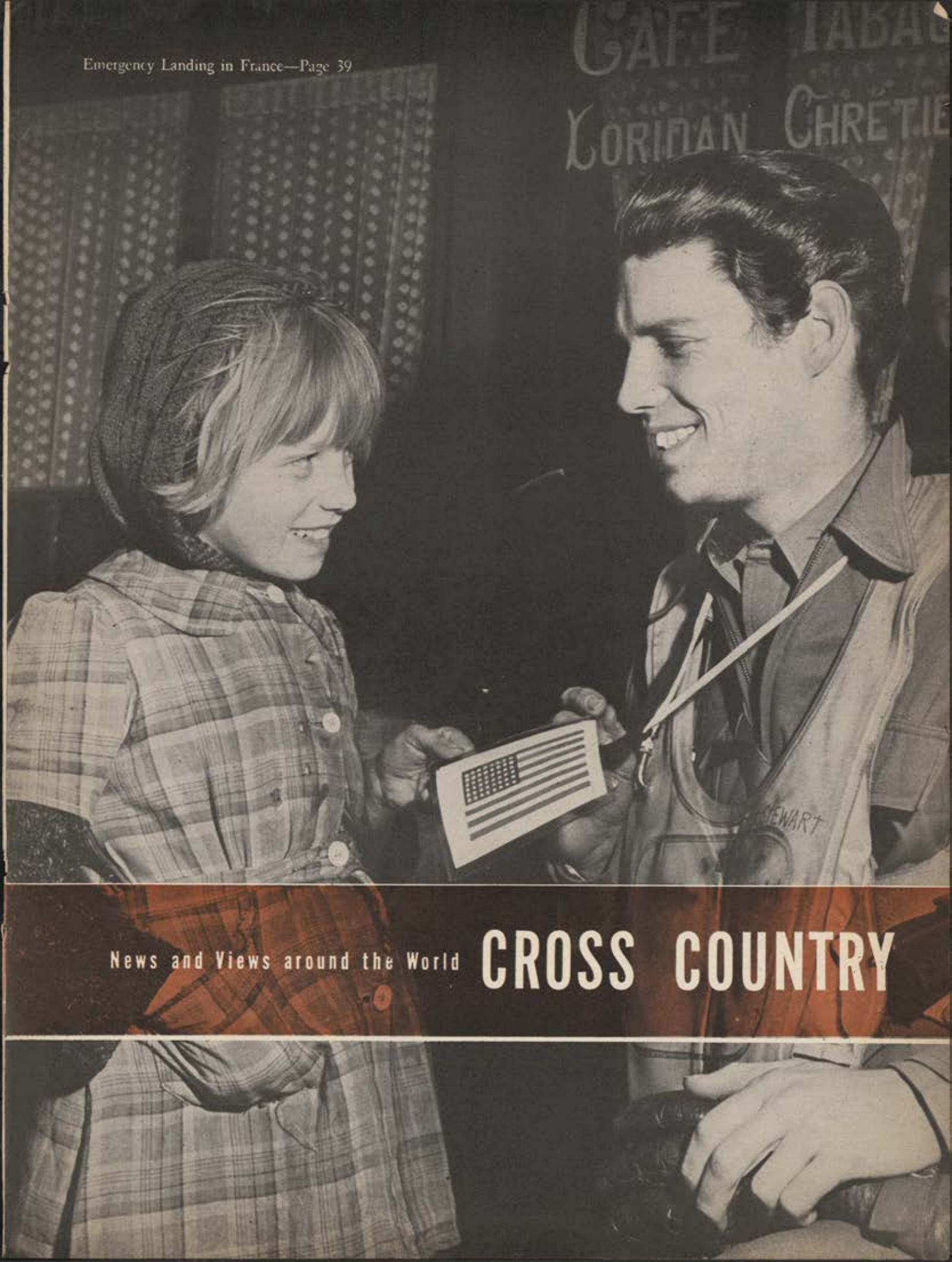
The achievement of maintenance personnel was equally impressive. Ground personnel were faced with a lack of equipment, tools, warehouse facilities, shortages of critical equipment and engine parts. They worked 24 hours a day under the most difficult field conditions of tropical heat and rain, repairing battle damage, changing engines, making inspections, refueling and reloading by feel and by flashlight so that returning aircraft would be ready for the next mission. By their ingenuity and their ability to improvise, they made it possible for over 80 percent of the total striking power to be airborne, and for over 90 percent of these to bomb effectively the targets.

Not one aircraft was grounded for lack of parts.

Only 1.3 percent of total airborne aircraft was lost.

It seems fitting to quote a Japanese broadcast made during the period of the incendiary attacks. Said the commentator, "The 21st Bomber Command is commanded by Lemay. He has experience in Germany. How were the bombings carried out in Germany? With about a hundred planes he raided German cities, followed by bombing German facilities." Then the commentator became slightly contemptuous. "The enemy changes his tactics very often. They take turns in bombing, shuttle about or have fighter plane escort. Tokyo to Saipan distance is far greater than London to Germany; Germany is carrying on with production of aircraft." Finally he reached the \$64 question. "You are not scared of these bombings, are you?"

It should not be a difficult question to answer. ☆



News and Views around the World

CROSS COUNTRY

Tropical Disease

As the war leaps closer to the Asiatic mainland and the most densely populated lands in the world, the lessons we have learned in the prevention and control of disease will become potent weapons.

In areas where the population density is less than 10 persons per square mile, simple anti-malaria procedures have been to pitch camp at least a mile from any native village; or to remove all native workers from military posts between sundown and sunrise when mosquitoes are most pestiferous, or even, if necessary, to evacuate and burn a tick-and-mosquito-infested village.

But these simple methods cannot be applied in more densely and more permanently populated countries such as China, where the average is 250 persons per square mile. However, there are other methods of keeping our men healthy and effective.

We now have both the knowledge and the techniques to keep military epidemic diseases at a minimum. The crucial link in the chain of prevention is personal and unit discipline. The medical officer has the information, preventive procedures are well standardized, and the materials—atabrine, screening, disinfectant and, especially, DDT

and energy of the unit commander, reflected in the alertness of his troops. The primary responsibility for the prevention of infectious diseases is fixed upon commanding officers of all grades (AR 40-210, 15 September 1942). The function of the medical department is advisory. Success is

lent insecticide—dimethylphthalate, which is the only effective agent against mites. Mite-borne typhus, or tsutsugamushi fever, is a new disease to most of us. It is a killer. Air engineers working in grassy or forest areas are most liable to infection. Whenever such terrain is being cleared for



Dusting out dengue



Mission against mosquitoes

—are on issue. Training and supervision are among the responsibilities of every unit commander.

We must insure that disability by disease remains a military factor on our side. Our superior sanitation discipline will be put to a severe test when we move into the more densely populated areas, where most of the inhabitants use human excrement for fertilizer. They just can't imagine how flies, mosquitoes and primitive sanitary habits can have any effect on living to a reasonably old age.

Where the routine measures are rigidly enforced, the men stay well. Screening, spraying, draining, atabrine treatment, preparation of clothing, purification of water and food doubtlessly are effective measures. The essential factor is the interest

possible only by close cooperation: the medical officer supplies advice, the CO enforces discipline.

Two recent major developments emphasize the possibilities of epidemic control. DDT insecticide has provided the Allied forces with a most potent weapon in tropical warfare. DDT stopped dengue on Saipan in short order. A new method of use is the spraying of DDT from airplanes. Spraying from the air will kill off most mosquitoes and flies, prevent malaria and dengue for from two to four weeks and aid greatly in keeping down dysentery and diarrhea. Periodic respraying with DDT is necessary until new airfields are worked over more permanently by malaria control units.

The second new weapon is a GI repel-

a new field, or when an enemy field is taken over, a command function is to see that all troops wear clothing impregnated with the insecticide until the area is declared safe.

Preventive medicine must be integrated as a part of strategy and tactics, varying with the situation. Even an air task force, quick-moving as it is, can secure almost 100 percent protection. With an adequate supply system, a squadron or air force which shows a high incidence of infectious disease is suffering not from bad luck, but from ineffective cooperation between medical officer and commander.

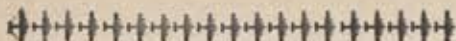
Mosquito "Bombers"

At the height of the fighting on Iwo Jima, three AAF transport planes took off from a 7th Air Force base in the Marianas to attack the mosquitoes on Iwo. The mission was flown by C-47s at a time when the Marines had occupied half of Iwo Jima's eight square miles. With thousands of Marine and Air Force personnel already on the island and more scheduled to arrive, the job of cleaning out dangerous insects could not be delayed until the Jap fighting was over. The planes often flew as low as 50 feet above enemy lines to spray the infested island.

The Shooting 13th

"Probably more than any other Air Force, the 13th has fought a gunner's war," says Brig. Gen. William A. Matheny, former commander of the 13th Bomcom and now Deputy for Flexible Gunnery on the staff of Lt. Gen. Barton K. Yount, commanding general of the AAF Training Command.

"During the period of the bombing at-



tacks against Truk, Yap and Palau, our crews made daily appointments with the Japs, without any possibility of fighter cover. For almost a year our crews knew they would be intercepted on every mission. The missions were so long it was necessary to schedule take-offs and landings at about the same hours every time, and as a consequence there was little possibility of varying the time of assault. The Japs knew about what time our planes were coming, and were ready.

"We had no problem of maintaining gunnery proficiency," continued General Matheny. "Our gunners didn't get out of practice, for they had plenty of real targets to shoot at on their combat missions."

Present gunnery training contrasts sharply with the hurried preparations of 1942, the General said. "Facilities were so limited that we took men with 20/20 vision and after a visit to the skeet range they were aerial gunners. We robbed turrets out of planes to show our gunners what a turret was like."

General Matheny took command of the 13th Bomber Command in 1943, and led it through the Solomons and Bougainville campaigns.

"The campaigns during that period were a series of moves from one coconut grove to another, and it was a lot of satisfaction to watch the bomb groups operate," the General said. "Those outfits got so much practice they could move at an hour's notice, just like a circus troupe."

FEAF Patch

A shoulder-sleeve insignie, emblematic of the operational sphere of the Far East Air Forces, has been authorized for wear by all FEAF personnel not assigned to the 5th or 13th Air Forces.

With a background of ultramarine blue, the diamond-shaped patch has in its center the traditional star and wings of the Army Air Forces. Below the wings are five stars which symbolize the Southern Cross. The upper symbol of the design is the golden-orange sun with 24 rays in eight groups of three as displayed on the flag of the Philippine Commonwealth.



Friendly Flak

One of the grave problems inherent in the use of heavy bombers for close-up operations—the establishment of a secure bomb-line to protect friendly troops below—was solved in a novel way during the heavy smash at German positions around

QUESTIONS on Policy and Procedure

Q. May returnees from overseas retain A-2 flying jackets and B-4 clothing bags?

A. It is the policy of Hq. AAF not to withdraw noncritical items from personnel who have been using this equipment overseas. However, only personnel as authorized by AAF Regulations may retain critical items, such as the B-4 clothing bag. Accordingly, the clothing bag will be allowed to remain in the possession of only authorized (flying) personnel in accordance with AAF Reg. 65-23. The type A-2 flying jacket, although not listed in appropriate Technical Orders as an item of issue, will nevertheless be allowed to remain in possession of individuals. (AAF Ltr 65-68, 21 March 1945)

Q. May the shoulder sleeve insignia of an overseas unit be worn by a returnee after permanent reassignment in the U. S.

A. Yes, but only on the right shoulder. The insignia of the new organization will be worn on the left shoulder. The shoulder sleeve insignia of the overseas unit may be worn (but not required) in the same relative position on the right shoulder sleeve. Individuals may select the particular unit shoulder sleeve insignia they desire to wear from those authorized for the organizations to which they were assigned while serving overseas. Under no circumstances will more than one such insignia be worn on the right shoulder sleeve at a time. (C3, AR 600-40, 18 April 45)

Q. May a prisoner of war demand that he be permitted to correspond with his family? What War Department publications outline rights of a prisoner of war?

A. As soon as possible, every prisoner must be enabled to correspond with his family himself, under the conditions provided in Article 36 of the Geneva (Prisoners of War) Convention. For information on the rights of prisoners of war, see WD TM 27-251 and WD FM 27-10; also AAF Manual 39-1. All personnel in combat areas or about to go to combat areas should be thoroughly familiar with their rights.

Q. Is the member of a combat crew wounded in action when flying under competent orders entitled to draw flying pay while hospitalized for the wound?

A. Yes. Military personnel in flying status who are wounded by enemy action while in actual flight should be considered as

having been "incapacitated for flying by reason of an aviation accident" within the meaning of par 10 and par 11, Executive Order 9195, 7 July 1942. This is in accord with the view of the Comptroller General. See 23 Comp Gen 267, 9 October 1943.

Q. May recreation items, such as phonograph records too large to meet regular postal requirements, be sent overseas?

A. Yes, but not to individuals. Parcel post, weighing up to 70 pounds in weight and measuring 100 inches in length and girth, may be sent to military agencies overseas. A package of phonograph records for instance, should be sent to Personnel Services of an activity, the Red Cross, etc. The parcel should be endorsed "For Military Agency." (Par 9 Cir 376, WD, 1944)

Q. Will WD MD Form 81, now in the hands of troops, be

automatically withdrawn and replaced by the revised form, Immunization Register and Other Medical Data, WD AGO Form 8-117?

A. No. Form 8-117 will be used as soon as available for recording all immunization of personnel upon entry into the service, and will be initiated for all personnel when occasion calls for additional recording of immunization, dental, spectacle, or sensitivity reaction data. (Sec IV, Cir 32, WD, 1945)

Q. May an officer consider the terms "accountable" and "responsible" synonymous?

A. No. An officer may have both accountability and responsibility for property, or he may have accountability alone or responsibility alone. For example, an officer who carries property on a stock record account and who has such property in his own custody, either in use or in storage, has both accountability and responsibility. An officer who carries property on a stock record account may issue it on memorandum receipt. In such case, he does not drop the property from his stock record account and he maintains accountability, but does not have responsibility as the property has been entrusted to another who is to be charged with its care and safekeeping. The officer who has given the memorandum receipt has responsibility, but does not have accountability, as he is not required to maintain a stock record account for the property. (AR 35-6520)



PREPARED BY THE OFFICE OF THE AIR INSPECTOR

Eschweiler a few months ago. Mindful of the damage that had been caused at St. Lo by the malfunctioning of some bomb-bay doors and the mistaken identification of the target area by a few aircraft, steps were taken to deal with both hazards.

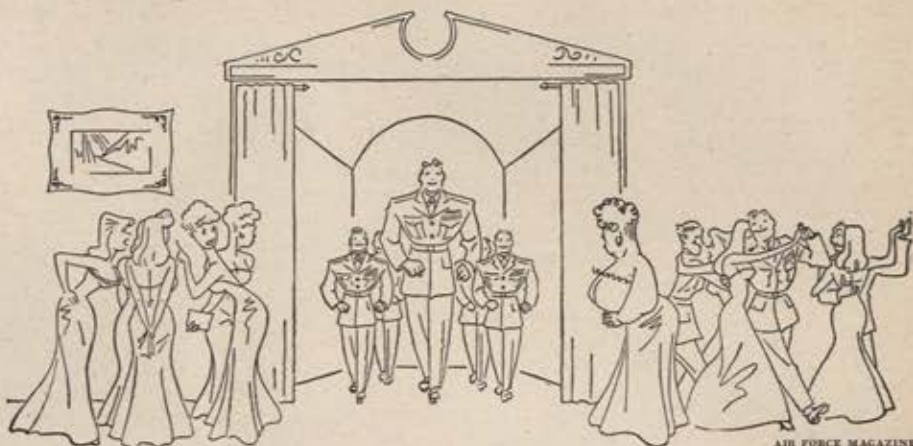
In the first instance, bomb-bay doors were opened over the Channel, then locked until the aircraft had passed a safe distance into the target zone.

Identification of the target zone was established by several interlocking methods—colored panels on the ground, barrage balloons, and a radio fan marker—but by all accounts the most successful aid was a line of demarcation beyond which it would be safe to bomb set up by bursts from friendly flak batteries. These were positioned on a 3,500-yard front, providing for bursts 500 yards apart 2,000 feet below the bombers, eight bursts simultaneously every 15 seconds. Extensive effort was made to insure continuity of communication among the batteries, and there were no communication failures during the entire operation. Nearly 500 salvos were fired during the bombing period, and it is officially recorded that not a single bomb fell on friendly troops.

Pilots and bombardiers reported favorably on the technique employed, although observing that the red bursts which they had been briefed to expect appeared as black save when they were directly above them. The wisdom in the use of alternative methods of identifying the target area was demonstrated by the fact that overcast prevented sighting of the colored panels on the ground, and a number of the barrage balloons were punctured by flying metal and collapsed, but the line of friendly flak bursts was clearly distinguishable by its positioning, spacing and timing.

Bombed Bomber

On a night mission over the Jap Bonin Islands, four Liberators sneaked in between the hills to bomb shipping installations. Just as the bomb bay doors were opened, an accurate volley of antiaircraft fire burst



"I'll handle the B-29, you girls take care of the fighter escort."

in the tight formation.

Cpl. Vincent F. Sutter, waist gunner, saw the frame of another Liberator loom up beside him. He braced himself as the wingtip of his plane crashed into the nose of the other bomber. He watched the other plane rise, and at that moment a 2,000-pound delayed action bomb rolled out of the neighboring plane and crashed into his bomber, lodging in the waist, two feet from where the corporal was standing.

On the flight deck the pilot, Lt. Robert L. Strong, felt his controls lock as the cables running through the waist were pinned against the fuselage. Aided by the copilot, Lt. Thomas B. Engram, he was able to pull the B-24 out of a dive when there remained less than 100 feet between them and the harbor waters.

Unless they could jettison the bomb quickly, the crew realized that its weight and the vibration of the torn fuselage would saw the control cables apart. Cpl. Milas Kennington, flight engineer, hurried down from his top turret and surveyed the situation. He then stripped down the two waist guns and, using their barrels as crow-bars, he and the men were able to pry the bomb loose and dump it out.

All that remained then was a six-hour

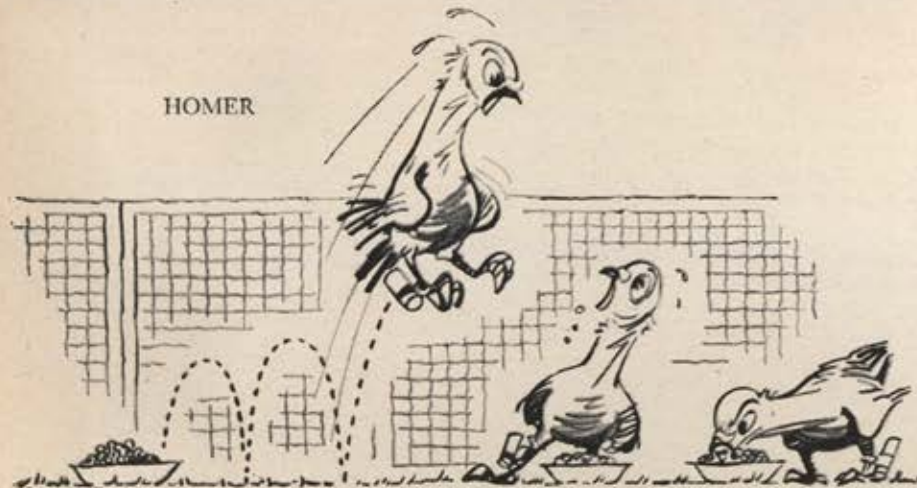
flight over the Pacific in a B-24 so torn and weakened in the middle section that it defied nearly all the rules of aeronautical structure. But they made it back to base.

AAF Scientific Advisory Group

A number of scientists are serving as a Scientific Advisory Group to the Commanding General, Army Air Forces, with regard to planning for future development and research for the AAF. Most of the personnel in the group have been engaged in war-work since the beginning of the war, some even earlier.

The group is under the direction of Dr. Theodore von Karman, who before undertaking this assignment was Director of the Guggenheim Aeronautical Laboratory at the California Institute of Technology, and was engaged in research on rockets and jet propulsion. He is an outstanding leader in research on aerodynamics and aircraft structure.

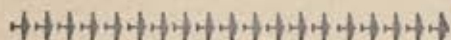
The other civilian members of the group are: Dr. L. A. DuBridge, Director of the Radiation Laboratory of the Massachusetts Institute of Technology, who has done outstanding work in electronics and radar fields; Dr. Vladimir K. Zworykin, Assistant Director of RCA Research Laboratory, who developed the iconoscope, electron microscope and numerous television devices; Dr. Hugh L. Dryden, Chief-Mechanics and Sound Division, National Bureau of Standards, who has been engaged in the development of special missiles for the National Defense Research Committee; Mr. George S. Schairer, Chief Aerodynamicist of the Boeing Aircraft Company, who was responsible for the aerodynamic design of the B-29; Dr. H. S. Tsien, California Institute of Technology, an expert on rockets and their applications; Dr. W. J. Sweeney, Associate Director of Esso Laboratories, Standard Oil Development Company, who has made important contributions to the development of new aircraft fuels; Dr. F. W. Wattendorf, Civilian Director of the 20-Foot Wind Tunnel Branch, ATSC, Wright Field, Dayton, Ohio, who has studied the aerodynamics of modern aircraft power plants; Dr. D. P.



AIR FORCE MAGAZINE

"Which one of you birds put the Mexican jumping beans in my feed?"

LENT



McDougall, Deputy Research Director of Explosives Research Laboratories; Dr. N. M. Newmark, former Professor of Civil Engineering, University of Illinois, previously engaged in studying the effects of explosives in producing damage; Dr. George A. Morton, Electronic Research Laboratory, RCA; Dr. E. M. Purcell, Radiation Laboratory, Massachusetts Institute of Technology; Dr. A. J. Stosick, California Institute of Technology. Mr. Morton Alperin, ATSC, Wright Field, Dayton, Ohio, serves as Technical Assistant.

Emergency Landing Fields

The U. S. 8th Air Force Service Command's system of emergency landing fields and strips located throughout northern Europe has saved more than 600 warplanes.

The cover picture of Cross Country this month shows Lt. David Stewart of Dallas, Texas, shortly after he made an emergency landing on an airstrip near a French town. The photograph, taken by Corporal Kammerman of the 8th AAF, tells a little story of French-American unity as the P-51 pilot shows the American flag he is wearing for identification to a little French girl. Lt. Stewart was forced down while returning from an escort mission over Germany.



French-American smiles

The Service Command's emergency landing fields and mobile units have reclaimed planes which might otherwise have been lost to the air assault on the enemy.

Swing Low

After the first low-level bombing attacks on German robomb sites last year, P-47 pilot reports from the 365th Fighter Group did not give altitude, but they did contain such revealing references as: "Coming out of the dive, I leveled out almost above the trees" . . . "Ahead of me were some wires, like the high tension lines in the States; I tried to duck under them. The propeller cut several and wound up a few yards on the hub" . . . "To jump the trees in the

PLANE BONERS

Analyzed by Veteran Pilots



ATLANTA, GA.—Pilot in P-61 overshot landing, first touching 2,000 feet down runway. Instead of going around the pilot applied brakes and attempted to stop before reaching end of runway. It didn't work and airplane nosed-up in soft dirt.

Comment: It seldom works. If at first you overshoot, go around.

LONG BEACH, CALIF.—On B-24 take-off pilot braked wheels preparatory to raising gear. Left wheel had not cleared runway and tire blew out. On landing the pilot held left wing up as long as possible but when tire settled to runway the plane veered into soft dirt, and nose gear collapsed.

Comment: Best braking time is after plane leaves ground, not before. If you are caught with a flat tire in a B-24 successful landing is possible with little or no damage. Procedure recommended in a B-24 Pilot's Training Manual is:

1. Notify tower that full stop landing on runway is necessary.
2. Get permission to use runway with wind quartering from good tire side if possible. But avoid drift or you'll blow the other tire, too.
3. Cut sink to minimum by controlling it with power.
4. Get nose down upon contact and hold forward pressure upon nose-wheel. Directional stability of tri-cycle gear will help hold airplane straight.
5. Use power on flat tire side with light braking on good tire side to maintain a straight path.
6. Keep airplane where it stops until tire is changed.

VICHY, MO.—On C-46 night take-off the crew felt a jolt and the left engine quit. Pilot immediately called for emergency landing, and while coming in the right engine sputtered and stopped. Wheels in down position were retracted and a belly landing made.

Comment: On takeoff this C-46 struck an inadequately marked trailer parked seven feet at right of runway. Jolt jarred fuel lines loose, causing engines to miss and stop. The plane's pilot did some quick thinking, nosed down for landing and retracted wheels for belly landing when last engine gave out. If control tower had been on the ball, pilot would have

been warned of danger offered by parked trailer. But they hadn't bothered to check as to whether runways were really open when they so declared them.

KISSIMMEE, FLA.—A P-47's tire blew out on landing, but the pilot kept the plane under control and was nearly stopped when tower told him to clear runway if he could. He couldn't. Flat tire came off as plane moved off runway, throwing the P-47 on its nose.

Comment: Don't, except in an emergency, move a plane by its own power when it has a flat tire no matter what anybody says.

LAKE CHARLES, LA.—An F-7B on a photo mission landed after a routine cross country flight. Leading edge of the horizontal stabilizer was found to be damaged by the 5-man life raft which was blown out of its cradle in flight.

Comment: Either the life raft in this plane became partially inflated and blew out the door or the door was improperly installed, allowing the raft to blow out. Check your raft before take-off and see that it and all allied equipment are properly installed.

POPE FIELD, N. C.—Crew chief of a C-47A was sucked out of the plane while attempting to replace the parachute. Not wearing a parachute, he fell 13,000 feet to his death.

Comment: It's tragic that working with paratroopers didn't convince this man of the importance of parachutes. Have your parachute with you. Wear it at all times when you are in danger of falling out.

MADISON, WIS.—At 140 mph, 1,500 feet from start of takeoff run, a P-63C pilot retracted his landing gear. The P-63's nose was lowered and its prop chipped up chunks of runway because the plane was not airborne.

Comment: Some pilots never learn.

GREENWOOD, MISS.—A P-51D pilot used full flaps to land in a gusty wind. The right wing started down and the pilot applied full left rudder but the plane ground-looped.

Comment: Best P-51 procedure for gusty wind landings is to come in slightly faster than usual, using half, not full, flaps. The ballooning effect of a gust is apt to drop the plane out from under you, sticking a wing in the ground. Keep sufficient speed to cushion this drop.

NOTE: In the May issue, two items in PLANE BONERS were concerned with instances in which emergency landings in rough fields were made wheels down. The comment neglected to point out that accepted procedure for emergency landings in rough fields is wheels up.

PREPARED BY THE OFFICE OF FLYING SAFETY

NEW BOOKS



WAR

HI-SKY, THE UPS AND DOWNS OF A PIN-FEATHER PILOT. Alec McAlister. A young airman's experiences in the British Commonwealth Air Training Plan. RYERSON PRESS, TORONTO, 1944.

HISTORICAL

THE WORLD AT WAR, 1939-1944. U. S. War Dept. Military Intelligence Division. Brief history of the origins and operations of World War II. INFANTRY JOURNAL, WASHINGTON, 1945.

POST-WAR

PSYCHOLOGY FOR THE RETURNING SERVICEMAN. National Research Council. Psychological facts about the thoughts and feelings of servicemen. INFANTRY JOURNAL, WASHINGTON, 1945.

TECHNICAL

AIR NAVIGATION, PART SEVEN: CONTACT FLYING. U. S. Bureau of Aeronautics (Navy Dept.). Publication of this volume completes the Navy's Flight Preparation Training Series. MC GRAW-HILL, N. Y., 1945.

AVIATION RADIO. H. W. Roberts. Radio facilities and navigation, and the design and installation of radio apparatus. MORROW, N. Y., 1945.

INTRODUCTION TO MICROWAVES. Simon Ramo. The physical basis for all microwave phenomena. MC GRAW-HILL, N. Y., 1945.

PHOTOGRAPHIC SURVEYING. B. B. Talley and P. H. Robbins. Theory and application of photogrammetry. PITMAN, N. Y., 1945.

PHYSICS OF FLIGHT. Alfred Lande. Basic principles involved in the flight of airplanes. REINHOLD, N. Y., 1945.

THEORY OF FLIGHT. Richard Von Mises. Fundamental ideas underlying the design and operation of modern aircraft. MC GRAW-HILL, N. Y., 1945.

YEARBOOKS AND HANDBOOKS

AIR NEWS YEARBOOK. Phillip Andrews. The second issue of this yearbook of photographs and air information. DUELL, SLOAN & PEARCE, N. Y., 1945.

AIRMAN'S ALMANAC. Francis Walton, Ed. The new 'World Almanac' for international aviation. FARRAR & RINEHART, N. Y., 1945.

JANE'S ALL THE WORLD'S AIRCRAFT, 1943-44 and JANE'S FIGHTING SHIPS 1943-44. The long-awaited new editions of two standard handbooks. MAC MILLAN, N. Y., 1945.

These books are available to AAF personnel through the AAF Field Technical Library Service, which provides for technical libraries at all major installations. List compiled by AAF Headquarters Library.

road between me and the target wouldn't have given me time to get back down to drop my load, so I let my wing cut through it" . . . "When I released my bombs I had to pull up sharply to clear the two-story building." That is what they mean by "on the deck" fighter attacks.

Battle Honors

More than a dozen AAF units have been added to the list of those authorized by Headquarters to wear the Distinguished Unit Citation, since the last previous listing in the May issue of AIR FORCE. Following are the units, the date of action and a brief resume of the citation as published in General Orders of the War Department. In response to several suggestions, the numbers of the GOs are given in parentheses, following each citation.

33rd Fighter Group Jan. 15, '43
Scored a decisive victory over German Air Force planes in Tunisia when its forward bases were under attack, thus preserving them for use against Axis preparations for an offensive in Central Tunisia. Despite extreme difficulties in obtaining equipment, supplies and personnel replacements and the hardships of primitive living conditions, the P-40s of this group were kept airborne by ground crews. (GO 25, '45)

27th Fighter Group Sept. 10, '43
Contributed in great measure to the successful establishment of the Salerno beachhead by flying 12 missions on this date to create and exploit roadblocks which resulted in neutralizing the combat effectiveness of 3 Panzer divisions. In the first 5 missions, the A-36s of this group piled up a huge column of German armor and transport at a junction 70 miles from the beachhead, and in the succeeding 7 missions, low-flying strafing planes destroyed a total of 177 vehicles while damaging 246 more vehicles and guns. (GO 21, '45)

1st Air Commando Group Dec. 1, '43—May 20, '44
Carried assault troops and engineers behind enemy lines in Burma to initiate the invasion of Myitkyina, after intensive preparatory efforts over a period of months. The security nature of the undertaking ruled out the use of native labor, and officers loaded bombs and refueled planes, while enlisted men unloaded box cars. The liaison section of the group evacuated as many as 700 sick and wounded in less than 3 weeks, and the assault force on one mission (March 8) destroyed 20 percent of the known Jap aircraft in Burma. (GO 26, '45)

67th Reconnaissance Group (Tactical) Feb. 15—Mar. 20, '44
Provided indispensable low altitude oblique photos of the Channel Coast from Le Havre to the Straits of Dover prior to the Normandy invasion, in a total of 83 missions flown from the vulnerable altitude of 3,500 feet. To accomplish their objective, the pilots had to forego evasive action, and fly straight, level, undeviating courses in the face of heavy concentrations of enemy ground fire. (GO 25, '45)

450th Bombardment Group (H) Feb. 25, '44
Rendered an invaluable contribution to the Allied war effort by destroying the Prufening Aircraft Factory in Regensburg, whose capacity was 250 ME109s monthly. The B-24s of this group led an entire wing formation to the target, despite flak and enemy fighters that cost them 4 bombers. (GO 3, '45)

459th Fighter Squadron Mar. 11—May 19, '44
Though forced to seek out and attack the enemy over his own airdromes in the IB Theater, this squadron destroyed 119 Japanese aircraft in 70 days, with a loss of only 7 of their own. This average of nearly 2 planes per day was maintained in spite of shortages in aircraft and spares which kept the squadron at half its operational strength. (GO 26, '45)

1st Troop Carrier Squadron May 17—June 16, '44
Carried American infantry, airborne combat and construction engineers, Chinese artillery and infantry and other troops in unarmed, often overloaded, cargo-type planes from points in Assam, India, to the assault of Myitkyina, Burma. Also, nearly 2,000,000 pounds of supplies were flown to this area, as well as nearly 3,000,000 pounds to ground units fighting in other points in Northern Burma. (GO 26, '45)

326th Airborne Engineer Battalion June 6—11, '44
Were instrumental in achieving decisive results in the early critical days of the Normandy invasion. Because of widely scattered drops, the first echelon attached itself to parachute elements nearby, and fought as infantry for 36 hours in order to reach its designated assembly points. Among their accomplishments was the construction of a bridge across the Douve River which made possible the successful assault on Carentan by parachute infantry. (GO 30, '45)

1st Emergency Rescue Squadron Aug. 17—21, '44
Performed seemingly impossible landings and rescues in heavy seas, under adverse weather conditions and frequently in the face of fire from enemy shore batteries. Equipped with only 9 operational aircraft, they conducted exhaustive searches over the Ligurian, Tyrrhenian, Northern Mediterranean and Adriatic Seas. (GO 6, '45)

321st Bombardment Group (M) Aug. 18, '44
Executed a mission unprecedented in a single medium bombardment attack by sinking the battleship Strasbourg, the cruiser La Galissonniere and a submarine in Toulon Harbor, when their heavy guns posed a serious threat to Allied operations 3 days after the invasion of Southern France. The 36-plane formation negotiated the flight from Corsica bases by dead-reckoning, owing to hazardous weather conditions, and bombed from 13,000 feet despite intense fire in the heavily defended area which damaged 27 of the planes and wounded 12 personnel. (GO 25, '45)

36th Fighter Group Sept. 1, '44
Struck a decisive blow at enemy transport.

tation and personnel at an important juncture in the campaign of Northern France by destroying more than 500 vehicles in the Poitiers, Chatellerault, Clamecy, Bourges, Chateauroux area in 4 missions from dawn to dusk. The group was divided into 2 units, effectively patrolling all roads by which the enemy could escape from the area.

368th Fighter Group Sept. 3, '44

Aided the advance of ground troops in the vicinity of Mons, France, by carrying out 7 missions in which 262 enemy motor transport, 230 horse-drawn vehicles and various targets of opportunity were destroyed. The 83 P-47s made their attacks in the face of withering barrages of antiaircraft and small arms fire. (GO 25, '45)

404th Fighter Group Sept. 10, '44

Flew 3 armed reconnaissance, air-ground cooperation missions in the vicinity of Duren, Koblenz and Aachen in the course of which it destroyed 24 locomotives and more than 100 freight cars, rendered 2 bridges unusable and cut 32 railroad lines. This decisive blow to enemy transportation was delivered at low altitude despite extremely unfavorable flying conditions. (GO 25, '45)

405th Fighter Group Sept. 24, '44

Provided cooperation with ground forces at a critical juncture of an enemy counter-attack during the battle of France. Early in the day, two squadrons took off with a 1,500-foot ceiling, found their target by ground control and destroyed a number of enemy tanks from 800 feet. Another squadron was sent later to attack the same enemy formation, but, when it could not be located, attacked instead a reinforcing convoy of 100 armored vehicles and trucks. The remaining squadron was assigned to attack an enemy fort which had been offering stubborn resistance, and scored direct bomb hits on it. (GO 25, '45)

Oct. 15, '44

492nd Fighter Squadron (48th Fighter Group)

Frustrated an enemy counterattack against ground forces by interrupting its homeward flight, and strafing the armored spearhead of the attacking formation. Despite critical fuel shortage, the squadron carried out two minimum altitude runs with such accuracy that the enemy thrust was completely thwarted. (GO 25, '45)

365th Fighter Group Oct. 21, '44

Executed a highly successful fighter sweep in which 21 enemy planes were destroyed, one probably destroyed and 11 damaged. Sighting a formation of 30 FW109s approaching head-on, the squadron flying top cover feinted a diving attack, forcing the enemy planes to fly directly between the 2 following squadrons which struck viciously. On the homeward journey, top cover reported another enemy formation approaching and maneuvered them into a situation in which the same devastating process could be repeated. (GO 25, '45)

Dec. 24, '44—Jan. 2, '45

358th Fighter Group

Was principally responsible for the maintenance of aerial superiority against a resurgent GAF during the period of the

Ardennes breakthrough against the 7th Army. The climax of its effort of 79 missions flown in 9 days came on January 2, in the Saarguemines area, when 12 of the group's P-47s engaged in an armed reconnaissance encountered a large formation of FWs and MEs. Disregarding the enemy's numerical superiority, they jettisoned their bombs, closed for the attack and destroyed 14 without loss to themselves. (GO 27, '45)

357th Fighter Group Jan. 14, '45

Inflicted a humiliating defeat on a numerous and determined enemy formation while escorting heavy bombers on an attack on Derben, Germany. Nearing the target area, a force of 60 to 70 FW190s covered by nearly 100 ME109s, sought to break through to the bombers, but by superior tactics and fighting spirit, the pilots of this group triumphed in an aerial battle lasting 30 minutes in which 56 enemy aircraft were destroyed, against a loss of only 3 of their own planes. (GO 27, '45)

School in Italy

The little "belly tank" school house in southern Italy has been opened for business. There isn't any flinging of erasers, dipping of braids into inkwells, no car-

an Italian class with the aid of language records supplied by Special Services.

As soon as the last Mustang has been sweated in from the mission of the day, as soon as it has been serviced and prepared for another day of combat, school is in, and the men who have flown the planes or serviced them come flocking in for their lessons in the three R's and other related and advanced subjects.

The idea for the school first began to percolate in the brains of Capt. Felix Gervais, group special service officer, and his assistant, Sgt. Clarence E. Johnson. The men of the group had shown a tremendous interest when the AFI courses had been introduced, with more than 30 percent signing up for a variety of subjects. Special texts and reference books were ordered from the States to help these part-time students in their studies.

Many of the men who were taking the AFI courses felt that they were not getting enough out of them because of the lack of planning in their isolated self-study. It was at this point that Captain Gervais and Sergeant Johnson took a "reading." They found that there were many officers and enlisted men who were well equipped to teach school. They interviewed these men



"Belly tank" school house

toons on the blackboard, labeled 'teacher'; or any of the other high-jinks usually associated with school days; because this school-house is run by GIs of the 52nd Fighter Group of the 15th Air Force.

"Teacher" is generally one of the men of the group, who has had some civilian experience that qualifies him for the "position." The instructor in the photograph is T/Sgt. Anthony Pioli, who because of his excellent knowledge of the language, teaches

and were assured by them that they would be glad to help start a real school in the field, teaching at night in their spare time.

A school board was organized to plan the courses, the hours of study and select the subjects to be offered. They outlined courses in philosophy, history, economics, mathematics, engineering, physics and other academic and commercial subjects which would help the men prepare for further education, or fit them for postwar jobs.

TRAINING AIDS

Newly Standardized for Field Use

FILMS

- TF 1-3456, PASSENGER BRIEFING—Dramatized review of ditching procedure slanted to passengers of the Air Transport Command, both civilian and military. Running time: 26 minutes.
- TF 1-3453, OPERATION OF THE K-13 COMPENSATING GUN SIGHT—Trigger Joe, cartoon character, is again convinced of the accuracy of another of the K-series sights. Running time: 14 minutes.
- TF 1-3738, THE ELECTRICALLY HEATED FLYING SUIT—Shows how suit is made, how it is put on, used, taken off and cared for, and shows effects of high-altitude frostbite on the man who misuses this equipment or fails to use it at all. Running time: 21 minutes.
- TF 1-3745, REPLACEMENT OF MEDIUM PRESSURE HYDRAULIC HOSE ASSEMBLIES. Running time: 10 minutes.
- TF 1-3436, 50-HOUR INSPECTION OF THE B-29, PART V. FUSELAGE INTERIOR. Running time: 55 minutes.
- TF 1-3448, DRIFTMETERS: PART I, READING DRIFT. Running time: 17 minutes.
- TF 1-3449, DRIFTMETERS: PART II, GROUND SPEED AND BEARINGS. Running time: 13 minutes.

PUBLICATIONS

- COMING HOME (AF Manual No. 59)—For AAF combat returnees who are to be discharged or reassigned to duty. For better understanding of themselves in regard to readjustment to civilian life or reassignment at continental installations. (Copies available only from Air Surgeon's Office.)
- CARE OF PERSONNEL IN THE WET TROPICS (ADT Branch of AFTAC Bulletin No. 9)—Newly revised informational bulletin stressing precautions against insects, diseases, excessive heat, contaminated water and food, skin troubles and wild animals. (Copies available from AFTAC, Orlando, Fla., Att: Chief, ADT Branch.)
- A MANUAL FOR THE INSTRUCTOR ON THE POORMAN FLEXIBLE GUNNERY TRAINER (AF Manual No. 66)—Gives the instructor facts and principles needed for performance of duties with the device.
- FIGHTER GUNNERY, ROCKET FIRING,

DIVE BOMBING (AF Manual No. 64)—For fighter pilot use only. Limited number of copies available.

GRAPHICS

- BOMBS AND FUZES—Cross-sectional diagrams and "exploded" views of most of the bombs and fuzes used in aircraft bombardment. 35 sheets in full color.
- DAMAGE TO RUNWAYS—Single poster warning pilots against pivoting planes on locked wheels. This practice has caused serious damage to asphalt pavement, tires and landing gear.
- ELECTRICALLY HEATED OVERSHOE INSERT—Single poster pointing out that the Shoe-Insert, Flying, Electric, Type Q-1, is always worn over the shoe and under the boot.

RECOGNITION

- GENERAL PURPOSE TRAINER, TYPE R-2 (OPAQUE OBJECTS)—Handy projector for use in aircraft recognition training. Small, compact, and permits reproduction on a screen of pictures cut from Recognition Journal, newspapers, etc.
- B-1 BRITISH NAVAL VESSELS—Seven posters showing side views and plan drawings of several of each type of major naval vessels used by Great Britain.
- NEW AIRCRAFT AND SHIP SLIDE SUPPLEMENTS—Nos. 10, 11 and 17, U. S. aircraft; Nos. 12 and 19, German aircraft; Nos. 13 and 18, British aircraft; Nos. 14, 15 and 16, Jap aircraft. Also Ship Slide Supplement No. 2, showing British, Jap and U. S. warships and merchant vessels.
- AIRCRAFT SILHOUETTE POSTERS—Lot No. 16, U. S. planes; Lot No. 17, Jap aircraft.
- AIRCRAFT TEST POSTERS—Twenty-four in series, covering U. S., British and Jap aircraft operating in the Pacific theater.
- JOINT ARMY-NAVY SIGHTING GUIDE—Four-page folder keyed to "SWPA" ship reporting system, and used in reporting Jap warships, merchant vessels and aircraft.
- ALLIED SIGHTING GUIDE—Much like above Joint Army-Navy Guide, but used for Allied shipping.

When the theoretical groundwork had been supplied and agreed upon, there still remained a physical problem. There was no suitable building to house the school. Here the men themselves answered the problem.

Empty crates, in which the auxiliary gas tanks had been shipped, were carefully hoarded until a large supply was accumulated. The crates, stripped and cleaned, made pre-fabricated wall sections for the building. The interior walls were braised with acetylene torches so that the grain of the plywood came through sharp and clear, making a warm decorative effect without the use of paints or trims. Benches were made from scrap lumber. Blackboards were built into the walls. Bomb cluster boxes stacked on top of each other with their covers removed made bookcases for the library. A map and current events room was added, and school began.

Command Changes

- Recent command changes include:
- Lt. Gen. Barney M. Giles, from deputy commander, AAF, to commander, AAF forces in the Pacific Ocean Areas.
- Lt. Gen. Ira C. Eaker, from commander, Mediterranean Allied Air Force, to deputy commander, AAF.
- Lt. Gen. John K. Cannon, from commander, 12th Air Force, to commander, Mediterranean Allied Air Force.
- Maj. Gen. Benjamin W. Chidlaw, from commander, 22nd Tactical Air Command, to commander, 12th Air Force.

Hasty Hearts

S/Sgt. Roy W. Gutzmer of Rochester, N. Y., signpainter for an Aviation Engineer Battalion in the Marianas, has offered students of social science a new insight into human behavior. In addition to more pressing duties, the sergeant contributes to morale by painting the various feminine names which drivers have on their trucks; Doty, Mary, Lou—that sort of thing.

Sergeant Gutzmer was glad to render this service for a time, but lately he reports a wave of fickleness sweeping over his men. Sometimes he doubts that truckdrivers know their own minds.

"They used to be good steady Joes," he explained. "Now, I find they are sensitive and fickle. A guy will drive up and want Margie painted on his truck, even before Lucy is dry. Then next week he may be around to have Lucy put back on."

Sergeant Gutzmer says these caprices of heart can usually be attributed to the truckdriver's last letter, or lack of a letter.

Among the Souvenirs

Not long ago, a returnee came into the U. S. customs office at Miami Air Field carrying a nine-foot canoe which he had brought back from overseas.

The custom inspectors, long familiar with such sights, didn't bat an eye. The canoe was not contraband, and the GI was permitted to take it home.

"Someday," one of the inspectors said, "I expect to see a joker come through here

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

with a U-boat or the Taj Mahal."

On duty at the Miami ATC terminal, through which overseas returnees pass to have their baggage examined, the customs men have seen just about everything in the past year. One man brought 100 cigars, and occasionally a soldier will come through with \$100 worth of cigarettes, the allowed limit. Silk stockings, purchased at Natal and Persia and other faraway places, rate along with perfume as the most popular gifts GIs are bringing home to wives, mothers, sisters and sweethearts.

Intrinsic value of the gifts and souvenirs range from a few cents to more than \$100, but most highly prized are those on which there is only a sentimental value, a rusty Jap rifle, a tattered piece of an enemy battle flag, or a rainbow-colored pebble from some beach. It may even be a native straw hat or wooden shoes.

Crews on the Air Transport Command's famous "Fireball Express" planes, which fly out of Miami on regular Ferrying Division runs to India with high priority cargo, are experienced souvenir hunters. Between flights they have picked up literally everything that was loose in Natal, Ascension Island, Cairo, Khartoum, Karachi, and other points along the 13,500 mile route. Nearly all of them wear leather mosquito boots, usually purchased in Natal. Most of them have acquired daggers and billfolds in India. One crew chief has an imposing collection of wood carvings.

Perfume, jewelry, oriental curios and handbags are the most popular items brought back by GIs. Customs laws provide that \$100 worth of goods may be brought in duty free—provided none of it is on the prohibited list. The maximum on liquor and wine is one gallon. Certain perfumes are prohibited, and many others are restricted as to the amount which may be brought into the country.

Captured enemy firearms and other munitions of war are considered government property and may not be brought through customs as souvenirs of battle unless the "owner" has a certificate from his commanding officer stating that the items have been authorized as souvenirs by the theater commander. In many cases this authorization is granted with the result that many German and Jap revolvers and rifles, helmets, battle flags, and other small pieces of enemy equipment are streaming through customs and into American homes.

The Hermit

Sgt. Charles Sibray of Odon, Ind., is probably the tail-endest Tail End Charlie

in the entire AAF. His Fortress was flying over Germany when a direct hit set the left wing afire. The pilot warned the crew to prepare to bail out. Sibray disconnected his interphone for a few seconds to kick open the emergency door from his rear turret, then returned to his guns. The long silence that followed worried Charlie somewhat. An hour passed, and the big plane kept flying smoothly toward France. When it reached Nazi lines and flak bursts were seen from his position, the sergeant called out their location. Several bursts got uncomfortably close and Sibray began to wonder why the pilot didn't take evasive action. He left his turret to investigate and found



"Look, junior is a ball turret gunner just like you!"

that he was alone in the Fortress. He had been alone for the past 150 miles. Sibray bailed out and eventually got back to his base.

Where There's Hope . . .

A young hospital-trained copilot, Lt. Emmett R. Turner, Jr., of Stratford, Texas, pumped life back into the body of a gunner who had been unconscious for 90 minutes after being trapped without oxygen in the ball turret mechanism. The revived man was T/Sgt. Donald F. Houk of Appleton City, Mo. The action took place five miles above Germany.

Their B-17 had just dropped its bombs when Houk, radio operator and gunner, tripped and fell into that part of the turret mechanism which extends up into the fuselage. His oxygen mask was ripped from his face.

Lieutenant Turner and other crewmen who went to work to free the sergeant estimate that about nine minutes elapsed before they could get the gunner to a position where an oxygen bottle could be held to his nose—a longer time than life can

PARACHUTES

LOST

42- 75663B	43- 40536D
42-370615C	43- 40550D
42-634581D	43- 40582D
43- 16006A	43- 40867D
43- 40311D	43- 40874D
43- 40315D	43- 40880D
43- 40488D	43- 54423D
	43- 54545D

Return to field indicated by letter after number as keyed below

A—Army Air Field, McCook, Neb.
B—Mines Field, Los Angeles 45, Calif.
C—Page Field, Ft. Myers, Fla.
D—Yuma Army Air Field, Yuma, Ariz.

usually be sustained without oxygen at 25,000 feet.

When the lieutenant and crewmen began to apply artificial respiration, the chances of saving Houk were slight. His face was without color and no response came from his lungs for more than 90 minutes.

"The life seemed to have gone out of him, but I knew from my hospital training that a person can often be saved when it seems hopeless," Lieutenant Turner said. "Because he was still trapped under part of the turret, I could use only one hand, while the other boys held the oxygen bottle to his face."

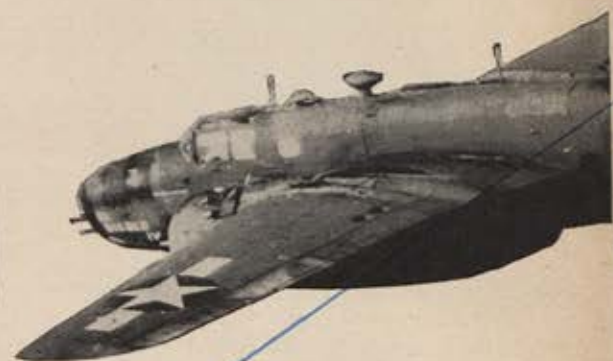
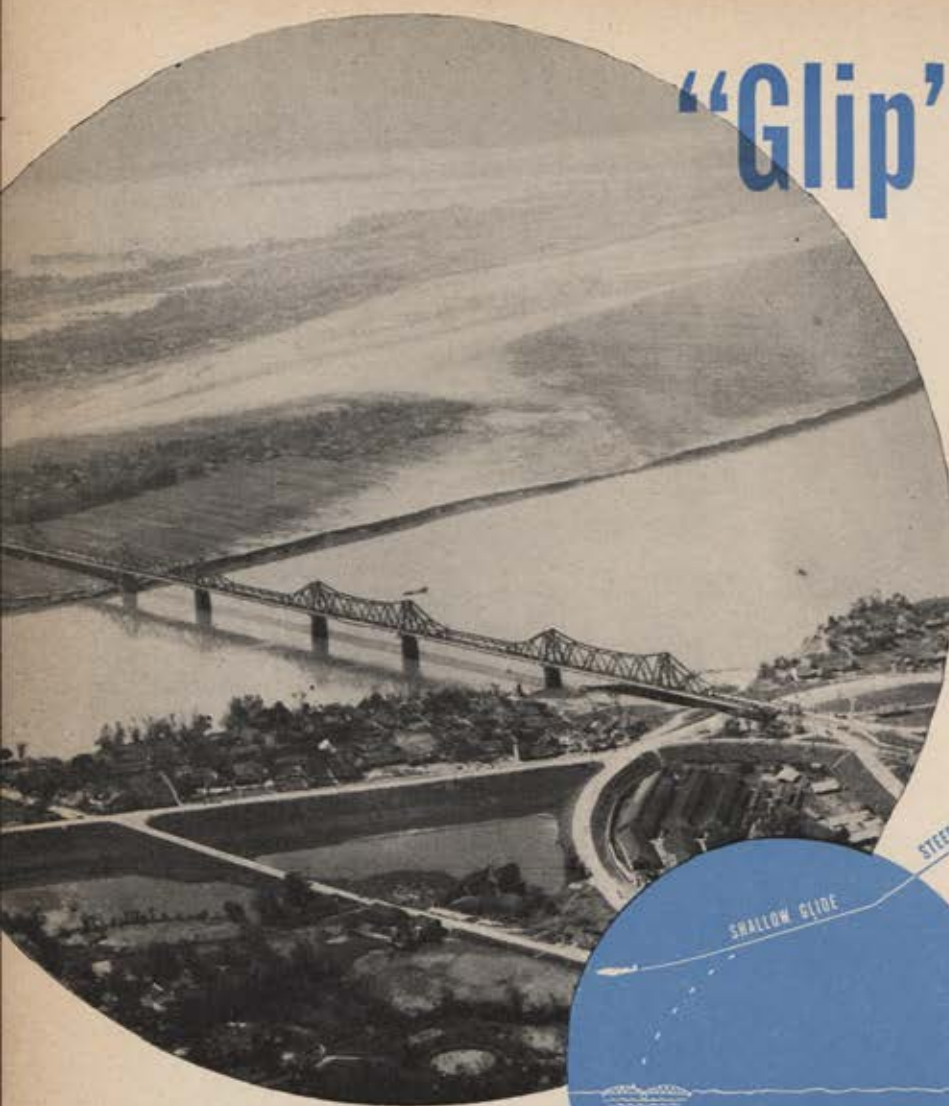
Finally, however, Sergeant Houk began to breathe faintly, and after 15 minutes he was breathing steadily. By the time the Fort reached its home base, he was able to leave the bomber without assistance. ☆

HOW SHARP ARE YOU? QUESTIONS

1. What plane is shown in background?
2. How many hangars can you see?
3. What is the trade name of the fork lift?
4. How many men standing on the fork lift?
5. How many red cross insignia do you count?
6. Can any planes be seen inside the hangars?
7. How many men on stretchers do you see?
8. How many ambulances have their doors open?
9. How many men, if any, standing on the plane?
10. Do the hangars have camouflage markings?

ANSWERS ON PAGE 60

"Glip" Bombing



When too many bombs were being used to destroy bridges, this 14th Air Force Group developed an economy technique

BY LT. COL. GEORGE W. TAYLOR

Chief, Operations Analysis Section
14th Air Force

When twelve B-25s returned from a mission to report that they had destroyed four bridges at an average cost of three tons of bombs per bridge, the 14th Air Force's "Falcon" bomb group knew that its "Glip" bombing technique had come to stay.

This proof of the pudding for the new bridge busting method was brought in by the "Ringer" squadron, whose targets had been strategic spans in French Indo-China. And, they pointed out, they were not just of the flimsy, wooden variety, but sturdily built, prewar bridges of steel and heavy masonry.

Improvisation in bridge busting methods is an old story in China and India. In the February issue of *AIR FORCE*, "Burma Bridge Busters" told how a 10th Air Force unit solved its problem of poor bombing results by developing a technique of shallow dive bombing which eliminated the "skip" from low level bombing.

The Falcon Group was hitting its bridges all right, but it was taking too many bombs. In December, 1944, their average cost was 15.5 tons of bombs per bridge destroyed . . . and that was when Glip Bombing, another variation of bridge busting, was born.

Maj. Gen. C. L. Chennault, commanding the 14th Air Force, was not satisfied with this bomb expenditure. Bridges

are one of his principal targets and tonnage expenditure one of his main operating limitations. He could not afford 15 tons of bombs plus some 30 tons of gasoline and other supplies for each of the many bridges that had to be destroyed.

It appears that to "get results," General Chennault made comparisons between fighter and bomber attacks from the standpoints of effectiveness and tonnage costs, and that the comparisons were not too favorable to the bombers. This subtlety plus an occasional rather blunt remark supplied a challenge to the Falcon group.

Col. D. L. Clark, commanding officer of the group and one of his squadron operations officers, Maj. James L. Flanagan, proved equal to the challenge. They developed a "double-glide" type of bombing which is known as "glip" (Glide-Skip) bombing. As used by this group, the method has proved itself superior to other bridge busting techniques. Furthermore, Glip bombing does not render the attacking planes any more vulnerable to antiaircraft fire, and it may make them less vulnerable.

That the aforementioned mission's cost of three tons of bombs per bridge was not just a stroke of good luck is proved by the group's subsequent record. On the next Glip mission, for instance, three squadrons made 28 sorties,

dropped 34.5 tons of bombs, destroyed six bridges and heavily damaged two others, at a cost of 5.75 tons per bridge destroyed.

Results comparable to these were not achieved immediately after the Glip technique was adopted. The first Glip mission was flown on December 11, 1944. One bridge was knocked out at a cost of 12 tons of bombs. This was not bad, but the next four missions were discouraging, for no bridges were destroyed.

It began to appear that Glip was just another one of those theories

that look good on paper but won't work in the field. On New Year's Day, however, things began to click, and two bridges were destroyed. During one period of two months, 19 bridges were knocked out at an average cost of 6.25 tons per bridge.

Glip bombing technique consists essentially of a double-glide approach: a steep glide, followed abruptly by a shallow glide. The pilot aims at a point in front of the bridge, and continues to glide until he reaches a low altitude where the glide angle is abruptly decreased. While the plane is in the shallow glide, the modified gun-sight (N-6), always preset before take-off, is used to aim at the bridge. The angle set into the sight is that obtained from skip-bombing tables, minus a correction to compensate for the glide angle. Bombs are released by the pilot from a low altitude with a smooth follow-through. Almost immediately after "bombs-away," the plane hits the deck and is free to take evasive action.

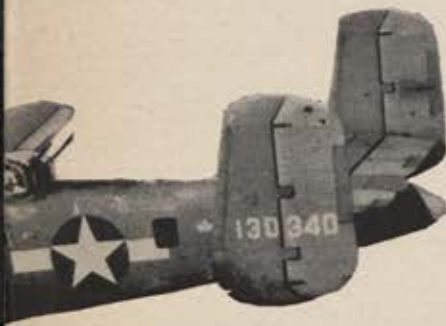
Throughout both steep and shallow phases of the glide, the deflection error is cranked-out, so that the plane is flying directly along the longitudinal axis of the bridge. Since bridge targets are usually long, errors in range that are not excessive are neutralized by length of the target.

In order for the low-flying bomber to avoid being caught in the blast or being hit by fragments, bombs are fuzed for a specific delay. With this fuzing, bombs pass through the bridge-deck and explode in the water beneath. The underwater blast is great enough to lift spans off the piers, and they drop into the water. When the explosion occurs close to a pier, the pier may be destroyed or displaced sufficiently to cause one or more spans to fall.

The double-glide path flown in Glip bombing is, in itself, a protection against ground fire. Neither the steep glide nor the shallow glide allows the antiaircraft gunners much time for accurate aiming, and the bombers of the Falcon group regularly strafe during the run and immediately following it. Only two bombers have been seriously damaged while making Glip attacks in 159 sorties, and interrogation indicated they were not flying the correct double-glide path.

On one recent mission, perfection was attained by one of the B-25 pilots. Taking careful aim, he released his first 1,000-pounder, then waited a few seconds for the report from his tail gunner. "You got it," came over the interphone. Moments later, the same pilot was attacking his second bridge for the day. The run was made and soon the tail gunner shouted, "You did it again." Two bombs, two bridges!

Glip bombing has been used only against bridge targets, for at this time bridge destruction is one of the more important tasks assigned the Falcon group, but it should prove equally effective against other long, narrow targets. ☆



A thin geyser of water spurts up above the structure of the Ninh Binh bridge as the Falcon bombers place an explosive underneath.



A few seconds later this long distance photograph caught the bomb exploding under the center span, breaking a link in Jap supply line.



The bridge is completely glipped and one of the riverboats seen in top photograph is sinking into the waters still rippling from bomb.

Rendezvous

(Continued from Page 3)

Not So Lucky

Dear Editor:

Will you please tell me what I've been doing in hospitals for the past 6 months, and how I got hit. In March edition of AIR FORCE you printed pictures of damaged planes under the title of "More Than Lucky." At the bottom of Page 62 is a B-17, and part of the caption reads, "No one was hurt." The story is that two were killed and two wounded; both of the wounded are now at this AAF Hospital.

S/Sgt. J. F. Maguire,
AAF Hospital,
Plattsburg Bks., N. Y.

The picture, an official MAAF photograph, came to us with the information that no one was hurt. We accepted and published this fact in good faith.—Ed.

Misleading Pictures

Dear Editor:

In reading AIR FORCE, January, 1945, we took special notice of your picture in the "On the Line" column.

After having worked on major aircraft repairs for a long time in England and France on the same type of aircraft, we have no doubt that the airplane shown in a damaged condition was neither repaired nor was it possible to repair under the existing conditions on the continent. In fact, factory facilities in the States would hardly undertake such a repair.

In the first place, attention is called to Technical Order 01-1-14, stating that aircraft parts subject to fire shall not be used under any conditions. As the picture shows, the engine and firewall area were burned and the engine nearly twisted off the firewall mounts. The wings, especially the left, were torn off and twisted, which would twist the fuselage. Also, the tail section forward of the tail cone and supercharger area was twisted and buckled; only replacement of the fuselage itself would suffice. . . .

Inspection Dept.,
Air Depot Group, France

Dear Editor:

. . . If your captions mean that an airplane was built around a portion of the aircraft tail section, I may agree. If anything but that is the case, let us know what sort of magic was used, and I'll requisition a carload of it immediately. . . .

Maj. Robert E. Perinovich, APO 374

If AIR FORCE led its readers to believe that the pile of junk in the one picture was "converted" into the flyable P-47 in the other picture, we are sorry. That was not our intention. The flyable 47 was rebuilt from the remains of several damaged P-47s; Hq 9th Air Force says "she was five or six destroyed planes—no one knows the exact number." The picture of the foamite-covered P-47 was submitted by Hq 9th Air Force to illustrate one of the sources for the rebuilt job. It was published by AIR FORCE for the same purpose. Unfortunately, we

(Continued on Page 60)



AAF QUIZ

WHAT'S YOUR AIR FORCE I.Q.?

Chalk up five points for each correct answer. A score of 90 or above is excellent; 75 to 85, good; 60 to 70, not too bad; below 60, tsf, tsf. Answers on Page 63.

1. A typical "pickaback" plane combination seen in actual combat is
A. ME109-ME323 C. Zeke-Hamp
B. FW190-JU88 D. Hamp-Dinah
2. AAF slang calls glider pick-up
A. Hook C. Tot
B. Catch D. Snatch
3. The Government pays about how much apiece for B-29s?
A. \$50,000 C. \$600,000
B. \$200,000 D. \$2,000,000
4. AAF group intelligence officer is
A. G-2 B. S-2 C. A-2 D. SA-2
5. Under the GI Bill of Rights, the Government will pay annual tuition of a qualified veteran up to
A. \$199.99 C. \$300
B. \$200 D. \$500
6. In the history of air warfare, the old USS Alabama is memorable because in 1921 it
A. Became the first aircraft carrier
B. Was the target of a famous air-sea bombing experiment
C. Was first to carry antiaircraft guns
D. Had a mooring mast
7. "Mach number" indicates
A. Mileage, Altitude, Course out, and Course home
B. Maximum capacity of a hangar
C. Quotient of a plane's true airspeed divided by speed of sound
D. Slang for MOS 747 (Airplane Mechanic)
8. Photogrammetry is
A. Camera record of aerial gunnery
B. Measurement of a plane's speed
C. Systematic photography of material, especially bombs
D. Surveying or mapping by aerial photography
9. The AAF's research and testing establishment located at Eglin Field, Fla., is called
A. Testing Center
B. Research Board
C. Proving Ground Command
D. Tactical Center
10. On the average, the best weather for flying in the U. S. occurs in
A. Nov-Jan C. Feb-Apr
B. Mar-Jun D. Jul-Oct
11. AR234 is the designation for
A. An AAF reconnaissance plane
B. The Army regulation on safeguarding military information
C. A Jap medium bomber
D. A German jet-propelled aircraft
12. The engine on a P-80 Shooting Star can be changed in about
A. 15 minutes C. Three hours
B. Nine hours D. 90 minutes
13. In the phrase "5th Air Force ADVON," ADVON means
A. Advance communications
B. Adjutant's verbal order noted
C. Advance echelon
D. A formation of night fighters
14. An orthopter is
A. An amphibious helicopter
B. A plane with optical sighting gear
C. A reconnaissance balloon
D. An aircraft with flapping wings
15. The first B-29 Pacific base for operations against the enemy was
A. Hawaii C. Saipan
B. Guam D. Tinian
16. "Jabo" is the German contraction for
A. Yes, sir
B. Bombing mission
C. A .50 cal. machine gun
D. A type of airplane
17. A warrant officer (jg) and a flight officer receive the same base pay.
A. True B. False
18. If a signal is dispatched from New York City to Birmingham, Ala., at 1400Z, and consumes one minute in transmission, at what hour standard time is it received in Birmingham?
A. 2.01 PM C. 9.01 AM
B. 10.01 AM D. 1.01 PM
19. AAF's first strike at Formosa was made by
A. 5th Air Force C. 14th Air Force
B. 7th Air Force D. 13th Air Force
20. These four 20 mm cannons are on the belly of what plane?



Development, Maintenance and Supply of Aircraft and Equipment

technique



Debugging Aircraft Cameras—Page 50



Two views of new XR-8 helicopter in air. Almost vibrationless craft features dual three-bladed rotors that intermesh, and vertical fins like a miniature B-24 tail.

The "Synchropter"

Having a profile like the nose section of a big bomber, the Kellett XR-8 helicopter—called the "Synchropter"—is now solving many of the problems that prevented previous AAF helicopter models from achieving more complete success. With twin three-bladed rotors that revolve opposite to one another and intermesh like an egg beater, torque forces are neutralized and rotor vibration is smoothed out. Weight is also saved through the elimination of long drive shafts and extension support arms that featured the rotor system of the XR-1.

An air-cooled engine developing 245 hp is housed directly behind the two-place, plexiglas-enclosed cockpit, and its semi-vertical drive shaft is geared to the dual rotors. Controls include a conventional stick, pitch control lever, and rudder pedals which give the craft directional control by varying the pitch of its rotors. Small horizontal fins that stick out about two feet from each side of the fuselage near the tail improve longitudinal stability during forward flight, while vertical fins on a later model provide added directional stability, giving the XR-8 a miniature B-24 empennage.

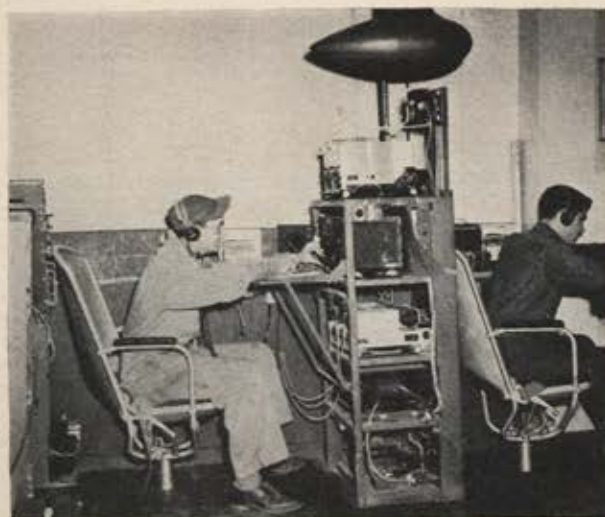
Individual rotor diameter is 36 feet, but the hubs are four feet apart, making a total rotor span of 40 feet. Gross weight of the new helicopter is approximately 2,900 pounds.

Combined Crew Trainer

In order to provide more realism in training and to generally improve the effectiveness of combat-procedure exercises received by aircrews, a "Combined Crew Trainer"

has been developed by the 9th Bomber Command for pilot, navigator, bombardier and radioman.

The pilot receives training in instrument assembly pattern, basic instrument procedures and confidence in his instruments, precision flying, following the bombardier's Pilot Di-



Simulating positions in bomber interior, radioman sits behind navigator in combination crew training arrangement which gives realistic combat exercise to all members of crew but gunners.

rection indicator, and radio procedures to include proper frequencies for different purposes. The navigator obtains practice in DR navigation, radio navigation, and the use of various radio aids. The bombardier is exercised in the procedure and technique of making a PDI bombing run, pilotage, manipulation of bombing switches and teamwork with other crew members, while the radio-man is trained in standard signalling procedure, liaison set tuning, use of codes and working with D/F stations.

Before using the trainer, the crew members and the operating personnel are briefed for the mission as though they were actually being readied for a flight over enemy territory. Information is given on weather, route, signals, diversion airdromes, air-sea rescue procedure and the target. Everyone then takes his position and after an interphone check the mission begins.

Because of the limitations of the Link, flight is started at from 5,000 to 10,000 feet, with an instrument assembly pattern being flown before climbing to normal operating altitude. Beginning with the take-off, the navigator plots his DR course by means of a set of remote instruments, and continues it until the end of the problem. Course is flown to the target area, where the bombardier, seated in the bomb trainer building, takes over direction through his bombsight and the Pilot's Direction Indicator. On completion of the target run, the navigator again takes over and directs the pilot back to base. During this time the radio operator is transmitting and receiving messages over his liaison set, and is obtaining radio fixes and headings on the radio compass. All men are able to converse with one another over interphone, liaison, command channels and VHF channels, and at the end of the mission a critique is held.

To add realism to the training mission, many modifications may be added, such as diversion to another target or base, ditching emergencies, or encountering a balloon barrage.

Burma Railsplitters

During the Burma campaign, the few railroad lines available to the Japs were repeatedly bombed by flyers of the 10th Air Force, but seemingly with little success. The fault was not with the bombardiers, for their accuracy was above reproach; rather, the bombs were striking the steel tracks and then bouncing off to explode harmlessly to the side of the roadbed.

To solve this problem in interdic-

tion, a method of attaching spikes to bombs was improvised so that when the bomb landed on the rail line it stuck there until the explosion occurred. At first, old truck axles from Ordnance salvage yards were used for this purpose, being cut off, sharpened and fixed to the nose of 100-lb.

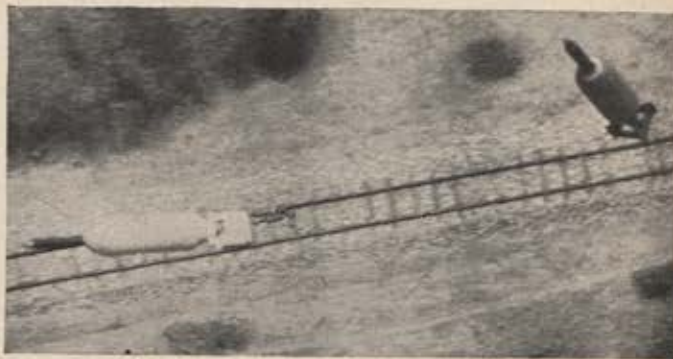
bombs. Now, however, specifications and drawings have been received in the U. S. and standard spikes are being developed for hundred-pounders. To fit in the B-25 bomb bay, they are 14½ inches long, while spikes for B-24 loads are 17¾ inches long.

Gyroscopic Gunsight

A new gyroscopic gunsight, invented by the British and manufactured in the United States, is now helping AAF fighter pilots to bring down increasing numbers of enemy planes, and has proven especially effective against the jet aircraft the Germans have recently used.

"With the old optical sight," says Capt. Louis N. Vacca, one of the men who played a leading role in having the gunsight installed in the 8th Air Force's

In operating gyroscopic gunsight, pilot manipulates six diamond-shaped lights, expanding the recticle image to follow the increasing size of the approaching target plane. The gunsight then automatically computes the required lead, keeping enemy within circle while guns blaze away.

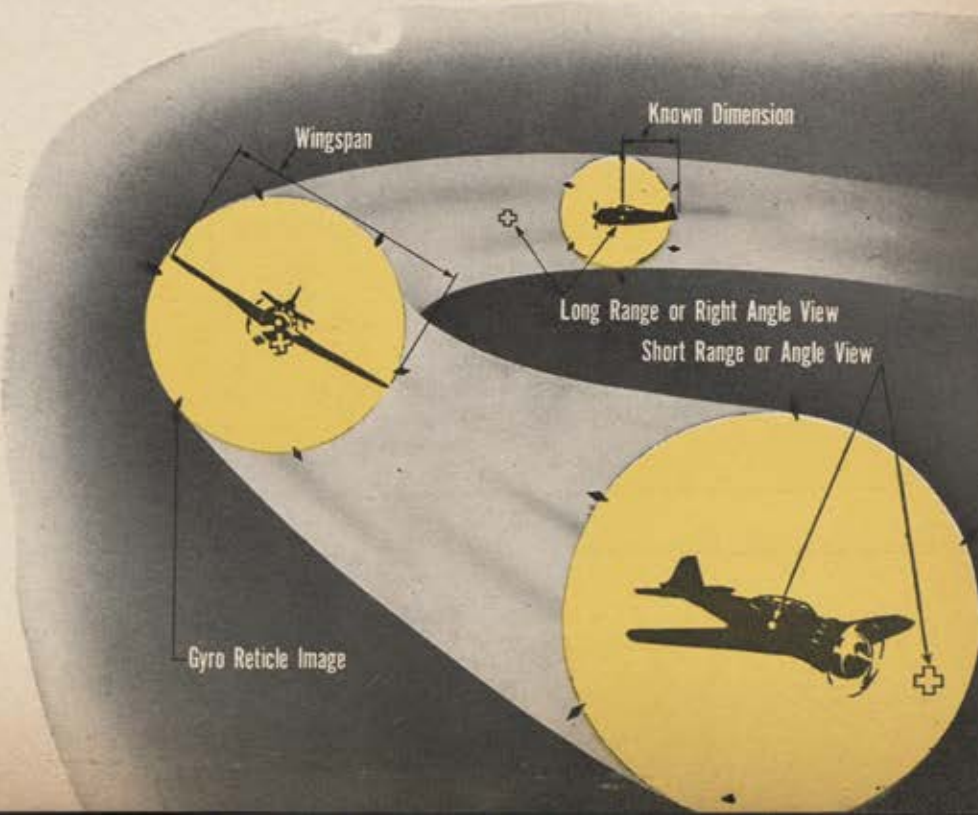


Spiked 100-pound bombs drop on a railroad line in Burma. The sharpened points hold them between ties until they can explode.

fighters, "anything but a burst of fire directly astern of the enemy was a guess. Now the pilot can 'clobber' his target from any angle and it has more than doubled his effective range."

In operation, a circle of six diamond-shaped lights with a dot in the center is reflected before the pilot's eyes. The pilot looks through the circle of diamonds at the enemy aircraft, and sets a lever on the type of aircraft he is attacking to govern the diameter of the circle according to the plane's wing span. He then twists the grip of his throttle, which widens the circle as the plane becomes larger on approach, and the gunsight automatically computes the necessary lead for the enemy target, keeping it within the circle until the flyer can get in a burst.

Using the new gunsight, pilots of



tech topics . . . about aircraft and equipment

Newest production models of the P-51 will have aluminum radiators which weigh only half as much as copper ones now in use. Recently perfected brazing process makes possible the use of aluminum here for the first time. This weight-saving factor for radiators may also be adapted for P-38s and P-63s.

Droppable, bomb-shaped auxiliary wing tanks are being made of transparent cellulose-acetate plastic. The idea is to save metal, but it has other advantages, since pilots can watch gasoline level, and observe any malfunctions in pumping devices. Small, two-bladed, controllable pitch propellers are also being made out of a new plastic material having a special cotton fabric base. . . . Flight Surgeons' medical kits, made of plastic laminate, may replace familiar leather bags.

An R-4 helicopter, anchored atop White Face Mountain in Vermont, is being used as a whirl test rig to study ice effects on the rotor blades. A proposed permanent helicopter test stand at Wright Field is to be 50 feet high and will permit testing rotors up to 100 feet in diameter.

Yarns spun from chicken feathers make up a new experimental fabric for the intermediate flying suit. Lightness and thermal insulation qualities of the cloth are its desirable features. An external switch for electrically heated suits permits turning off body heating elements yet permit heat to go into gloves and boots. . . . A tiny electric wire, only a few thousandths of an inch in diameter, but



which will carry necessary voltage, is being considered for use as thread for sewing up electrically heated flying suits. . . . Modifications being made on test samples of the Intermediate Flying Suit include a permanently attached suspender, cloth reinforcements at the elbows of the jacket and a full rayon inner lining for both jacket and trousers. . . . Latest Anti-G suits are being fabricated of a finer material that permits more flexibility. Brass weights also will replace lead weights in the G-valves to increase their durability.

A new lightweight flux-gate compass has been developed for use with the F-1 automatic pilot. If tests prove satisfactory,

the new compass will be substituted for heavier, standard types, saving 50 per cent weight. . . . High-speed, jet propelled aircraft have necessitated a new rate-of-climb indicator which has a dial range from 0 to 10,000 feet per minute. Conventional instrument (Type S-1) has dial range up to 6,000 feet per minute. . . . Experimental type G-2 true airspeed indicators are being designed with a speed range from 150 to 700 mph. They will operate at altitudes up to 50,000 feet and at any temperatures encountered in these strata.



water the instant the life raft strikes the water.

Two-switch control may be adopted to replace single switch for retractable landing lights. It allows separate operation of the retracting motor and the light. . . . Latest approach light, now being tried experimentally, has individual candle power twice that of present standard type D-1 lights.

To make training more realistic, engineers have developed an engine noise simulator for installation in various type flight trainers. . . . Development work has started on a mobile navigation trainer for use by replacement centers and Air Forces overseas. The trainer will be housed in a semi-trailer and will be used to teach all phases of navigation to ten students simultaneously. . . . The life history of an engine during flight, continuous engine speed, manifold pressure used, application of War Emergency Power and total power-on time now can be obtained on a mechanical Engine Data Recorder. The instrument, which weighs about 3½ pounds, is intended for installation in engine nacelles of all aircraft.

A new device for stereoscopic viewing of aerial roll film permits looking at third dimensional photographs without the necessity of cutting the roll into individual picture frames. A series of rollers and adjusters compensate for the overlap of the separate photographs in the roll. Photo technicians have also worked out a continuous roll film printer which will print pictures from a roll of negatives 400 feet long. Previously, roll film half that length was the maximum that could be processed in a standard printer.

the 357th Fighter Group, commanded by Lt. Col. Irwin H. Dregne, recently shot down 56½ Nazi planes on a single mission.

Can You Solve These

The AAF has requested that ideas directed toward the solution of the following problems be forwarded to the National Inventors Council, Department of Commerce, Washington 25, D. C.

1. A lightweight, reliable, simply installed thrustmeter for aircraft installation, combined with a torque meter, if possible.
2. A shock absorber that does not require the use of synthetic packing to retain the fluid in the strut.
3. A control cable having a coefficient of expansion close to that of aluminum alloys used in aircraft structures, or an equivalent mechanism that will take up cable slack.
4. To determine methods of fabricating quartz hairsprings and diaphragms for use in watches, aneroid barometers, altimeters, airspeed indicators and rate-of-climb indicators.

Debugging Aircraft Cameras

Because the defects in aerial camera equipment do not become fully apparent until the plane has completed photographic work under actual combat conditions, many modifications and improvements are necessarily executed in the field.

In the case of the B-29, the cameras were originally mounted in a rear section of the plane which was not pressurized, and once the cabins were under pressure, it was impossible for anyone to reach the photo apparatus.



Camera specialist is here shown changing a magazine on an aerial camera used on a P-51.

Electrical cables to the intervalometers in the nose of the Superfort were missing, male A&N plugs were located where female plugs were needed, and since the camera doors did not close tightly, the lens became coated with grease, oil and mud on every take-off.

When fuzzy photographs were obtained at first, it was generally thought that this was due to failure on the part of the crew to open the vacuum valves after take-off. Tests however, soon proved that the vacuum lines were too small in diameter and it was necessary to rebuild the camera vacuum system. After a simple modification was instituted, needle-sharp pictures became the rule rather than the exception.

At one of the early B-29 groups in India, it was discovered that the Superfort could not accommodate the photoelectric cells needed for night missions. Maintenance crews worked feverishly around the clock, drilling and cutting holes in the fuselage and floor plates so that the cells might be installed. Other difficulties were due to mechanical and climatic considerations, but one by one these problems were tackled by camera experts and eventually overcome.

A further camera bugaboo uncovered recently in another theatre, was the necessity for operating multiple-camera installations simultaneously so that the overlap in the photographs provided the same area coverage in any given strip of pictures. A timing device was therefore developed to operate as many as seven cameras in synchronization from an airplane and affords a uniform percentage of overlap in all photos taken from the same altitude.

A-26 Maintenance

Improvements in speed, range, maneuverability, firepower and bomb-carrying capacity are important considerations when comparing the A-26 with its A-20 predecessor, but equally vital is the greater ease with which the Invader may be readied for its combat duties in the air.

Interior attachments on the A-26 give it smaller wing-to-fuselage fairings, greater structural strength, a cleaner exterior and less sheet metal work. The dual wing spars result in less torsion of the wing, while use of heavier skin reduces wing panel repair. Both fuselage and wings are built in one piece, providing more rigidity and fewer fittings. Moreover, a noteworthy advance has been made in the "aft flight control mechanism," a compact grouping of all surface control cables in the tail, which



maintenance tips . . .

from the crew chief's stand

The committee for rehabilitation of P-51 tail wheel casings sends a strongly worded note of protest to pilots who commit "atrocities" against rubber treads by improper taxiing methods. Maintenance men should remind their flying officers to land with the tail wheel locked until the plane has completed its landing roll; then unlock the wheel before turning.

Troubleshooting shooting troubles, armament specialists of the 5th Bomber Command submit the following notes for gunnery modifications on B-24s:

1. To increase the cone of fire for waist guns and to give gunners more room, add three braces to lift the gun approximately six inches toward the center of the waist window and about the same distance out of the window.



2. Older Liberator models have Edge-water adaptors on waist guns, with four bolts on the back plate, making it difficult to perform maintenance on the gun while in flight. A Bell adaptor with a modified yoke is therefore recommended, since it has only three thumb screws and makes it simple for rapid repair.

3. It was found that when the rear turret was turned to a 45-degree angle from the longitudinal axis of the plane, the slipstream caused the spent links to be blown over the receiver of the guns, catching in the ammo belts. By putting a small deflection plate—six inches long by two inches high—on the side of the plane, the wind may be deflected and gun failure eliminated.

4. The old link chute for the nose turret is too small and it may frequently jam. Replace this by the upper link chute, which is larger.

On fully fifty percent of P-38s being ferried to their bases, improper handling by personnel has resulted in the plexiglas pilot's canopy being cracked. Bolts attaching the rear hinge should be installed so that they may be rotated by hand after the nuts are put in place. If the hatch is in full open position in a strong prop blast, or if it is violently thrown, pressed or pulled back, cracks will result.

Our maintenance line-up this month includes lining up the cotter key holes of

the B-24 engine mount bracket ring attaching nuts. Considerable difficulty has been experienced in this connection during engine change, and in order to obtain the prescribed torque and still align the holes, the use of shims is required. Where normal variation of dimensions of affected assemblies make this necessary, it is recommended that a 3/16" long slot be used to replace the present cotter key hole in the threaded shank of the bracket stud.

Says "drill" Sgt. James L. Sullivan, Heavy Bomb. Dept., Flight Test Section, Armament, Eglin Field, Fla., "The problem of obtaining electric drills may be somewhat alleviated by converting a Martin Ammunition booster motor in the following manner. Remove sprockets from each end of the booster motor and mount a 3/4" bolt drilled out to fit snugly over the sprocket drive. Sweat the drill chuck, drill chuck screw and drives into the bolt. Next, remove power jacks from motor and replace with lead wire about six feet long, with a plug on it adapted to the 24 v. socket of a heated suit jack box. The speed of the drill may be adjusted by using rheostat control on suit heaters located in various sections of the aircraft."



On B-29s, you may find that the upper surface of the wing flap, which contacts the fuselage fairing, becomes excessively worn. This is a design defect that has recently been discovered, and while action is being taken to correct production airplanes, Superforts on the flight line will have to be modified in the field. To remedy this condition, install thin chafing strips of cork, impregnated rubber or similar material.

Ring the bell, is a new TO on the installation and adjustment of the AN/APS-13 electronic set, providing both visible and audible warning of approaching aircraft. Tech Order advises locating warning bell where it can be heard by pilot only, and not be mistaken for bail-out bell by crew members. Supplementary information includes outline drawing of transmitter and receiver, coding diagram, antenna system and transmission line charts. TO number will be forthcoming in this column as soon as it is available.

translates itself into minimum variation in cable tension due to its central location. Accessibility for adjustment and repair is a feature of the system, since a single inspection door exposes the entire unit.

It is in engine accessibility, however, that the A-26 solidly establishes its maintenance superiority over the A-20. Power plant nacelles, which must accommodate engines, mounts, connections, landing gear, lubricants, gasoline and various operating systems, have been especially designed for speedy engine removal, convenient repair and ready exchange of necessary parts. Mounted on only six bolts, these power plant installations are completely interchangeable and can be replaced within two hours. Each nacelle contains a working platform, and by removing an access door forward of its location, a mechanic can climb up into the nacelle and sit there comfortably while working on electrical and hydraulic units, fuel lines and engine-driven accessories.

Deflector plates on leading edges of the wings are removable for access to all fuel lines, electrical wiring and control cables, and a similar removable-plate arrangement has been incorporated lengthwise along the fuselage. Through the bomb-bays, entrance is made to all bombing equipment, wing attachment fittings, gunner's sighting station, electrical flap operating mechanism and hydraulic units that operate the bomb bay doors.

Bombs are hoisted from built-in fittings, while 50 caliber ammunition is loaded through an opening on the underside of the nose installation for forward guns and through removable domes on the upper and lower turrets for the turret guns. Wing-gun ammo is loaded through a series of doors in the upper surface of the wings.

Certain modifications inevitably wait upon aerial operations to point out their need. One of these was the relocation of the battery from between the firewalls behind the engine to an open and accessible spot in the wheel well. Another such alteration was the replacement of the Dural bombsight mount by 1/4-inch steel plate, which reduced vibration.

Changes affecting the plane's combat performance are also the fruit of A-20 experience. A striking innovation is the double-opening cockpit canopy which is released by a handle placed directly over the pilot instead of far back almost out of arm's reach. Other cockpit improvements include a control de-

vice which locks all surface controls and throttles, an inspection window in the floor to check on position of the nose-wheel, centrally grouped landing gear position lights, and independent master and battery switches so that flaps or prop feathering pumps may still be operated in case the engines have to be cut. The electrically operated wing flaps extend back and down with a 55-degree arc of travel and consist of two overlapping sections which obtain increased reaction from the airflow to decrease speed and increase lift. New magnetos on the engines produce a higher voltage and a hotter spark, while improved contact points render pressurizing unnecessary and eliminate much difficulty with cables, harness and fittings.

Flying Repair Shop

A converted C-47, assigned to the 15th Air Force, now serves the Mediterranean Sea area as a flying aircraft repair shop. Answering emergency calls far from the Control Depot, the "Depot Belle" is equipped to handle almost any type of third echelon maintenance and repair operation. Items



Main cabin of C-47 modified as aircraft repair plane, looking aft. Shown are bench, cabinet, vise, arbor press and engine hoist.

carried aboard include a 24 v. put-put, a 110 v. generator, C-1 instrument test stand, hydraulic test stand, drill press, air compressor, arbor press, grinder, welding equipment, lathe tools and complete kits of specialized engineering apparatus.

Major Harvey J. Neeld, depot engineering officer, was assigned the task of making the conversion by Col. Monty D. Wilson, commanding officer, and was assisted by Captain Alvin Greenhorn, M/Sgt. John M. Ayers and Sgt. John C. Vaughn.

One of the first jobs undertaken by "Depot Belle" was the repair of a grounded P-38 some 600 miles away. Previously, such a mission required a truck crew traveling over winding mountain roads and remaining in the field between seven and 16 days. The flying repair shop performed the job in 36 hours.

Exposure Suit for Airmen

What the well-dressed crew member will wear in hazardous missions over the North Atlantic and the Aleutians may very well be a newly developed aviation exposure suit which has recently been successfully tested by air and naval services of Canada and the United States.

This important contribution to the saving of flyers forced down at sea is a lightweight, waterproofed garment which can be pulled over a regular flying suit and which keeps its wearer bone-dry from his Adam's apple to the tips of his toes. Since body heat escapes 25 times as rapidly in water as in air, the suit will vastly increase the chances of rescue for downed pilots and air crews before they succumb to exposure and shock.

At present, the new garments are made in several designs and of various

The AAF is pitching its fireball in Pacific strikes



Using gasoline and a special powder in proper amounts, a highly inflammable viscose gel is packed into 55-gallon drums to cover a 300-foot area with flame. At left, man demonstrates shackle connection, while at right, firebombs fitted with plywood fins are being salvaged.





fabrics, and are especially adapted for the protection of personnel against the loss of body heat. In actual tests conducted in cold water off the coast of Labrador, a group of volunteers clad in the exposure suits were able to bob around in the water or remain aboard life-rafts for hours on end without complaint. When they tried to do this without the protective apparel, however, they clamorously sought relief within an hour.

In charge of the entire project was a joint committee made up of representatives of the Emergency Rescue Equipment Section, operating under a directive of the joint U. S. Chiefs of Staff, U. S. Navy, AAF, U. S. Coast Guard, office of the U. S. Quartermaster General, Royal Canadian Navy, Royal Canadian Air Force, and the National Defence Research Council. The committee agreed that work should proceed immediately on a development program to combine the best features of all garments tested into two basic units: (1) a suit for aircrews who have no chance to put on a suit before ditching or bailing out, and (2) a suit which can be donned in the shortest possible time before abandoning the aircraft or which can be included in the emergency kits and donned after boarding a life-raft. It was further pointed out that much of the present emergency equipment is practically useless in a large number of cases, since floundering airmen are unable to use it because of the cold. In the North Atlantic tests, volunteers attired in the exposure suits were able to open and enjoy their emergency rations as well as operate radio sets. They were also able to right an upset dinghy with comparative ease, a feat difficult if not actually impossible in a water-logged flying suit.

Radial Engine Mockup

Recently adopted as a standard AAF training device, the Trainer, Mockup, Type 0-58 (Radial Engine) has been designed for classroom instruction in the basic principles and operation of a Wright Whirlwind nine-cylinder radial



what's wrong with this picture?

When the egress signal is given at high altitudes, the idea is to get out as quickly as possible—and that means using escape equipment correctly. These three sufferers from aerial claustrophobia are all up in the air about TOs 03-50-1, 13-1-3, and 13-5-2, and are supposedly committing nine mistakes. But look before you leap to Page 55 for a straight up-and-down accounting, and you may find several more that are being "hatched." The plane is a B-24 and the costumed performers are S/Sgt. William W. Yauch, Sgt. Ralph P. Ellefson, and Pfc. Jack R. Seifert, all of Squadron H, 4000th BU, Wright Field, Dayton, O.



engine, and is currently being distributed to field activities.

The device is a manually operated, animated cross-section of a radial engine with synchro-

nously movable crankshaft, master rod, articulated rods, pistons and valves. Firing is represented by properly timed illumination of miniature electric blubs powered by two six-volt dry cell batteries. Timing is demonstrated by a transparent timing plate and a rotating pointer, while the plate is graduated at five-degree intervals and is numbered every ten degrees.

The mockup is made of wood, masonite and plexiglas, and is finished in different colors to distinguish the various parts and give a three-dimensional effect. Detachable legs support its 48-inch height in a vertical position.

Information on this device may be obtained by writing through channels to the Training Aids Division, One Park Avenue, New York 16, N. Y.

New Glider Giants

Two huge engineless cargo carriers, now completing flight tests, have been developed by the Glider Branch of the ATSC Aircraft Laboratory to meet combat-inspired needs for gliders capable of carrying heavier and bulkier bat-

tle equipment by air. Designated as the CG-10A and the CG-16, both of these transports are considerably larger than either the CG-13 or the CG-4A—two of the biggest AAF gliders now in combat. Both have all-wood framework covered by thin plywood skin, and both designs incorporate tricycle landing gear with retractable nose wheels which put cargo sections close to the ground and function better than conventional gear or skids on rough terrain.

Largest of the two craft is the CG-10A, already in production, which has a wing span greater than that of a C-47. Six tons of aerial freight can be loaded through the split door in the rear of the fuselage, and the cargo interior, almost 30 feet long, seven feet high and 8½ feet wide, is the only glider cargo space large enough to accommodate a fully assembled 135-mm howitzer or a 2½ ton truck. Troop doors, one on each side of the fuselage, enable forty fully equipped infantrymen to jump clear in less time than the same number could get out of two C-47s.

The CG-16 is a twin-boom, single-tail glider that is slightly smaller than the CG-10A and has a wing span of 91 feet, 9 inches, a length of 48 feet, 3 inches and has many flying wing design

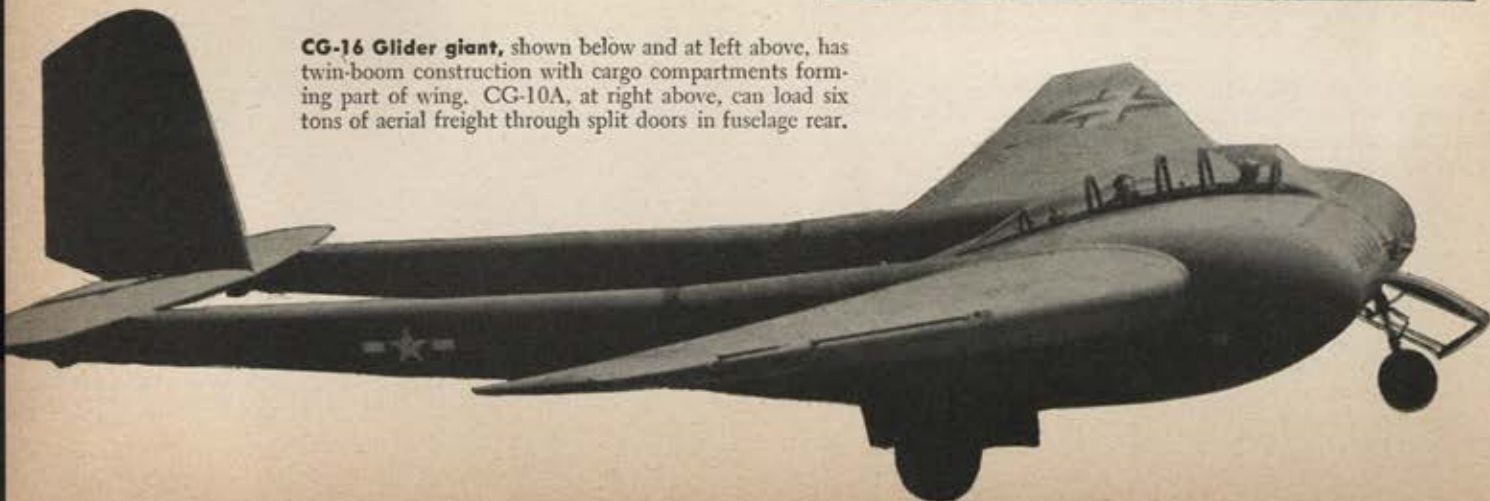
features, including a cargo compartment that is actually an enlarged part of the center airfoil section. The leading edge of the fuselage section is in reality double pexiglas doors lifting upward by means of hand-operated jacks, while the forward section of the cargo floor is hinged to form a loading ramp when lowered. Twin cargo compartments will carry a jeep in each section, or one 75 mm howitzer, and troops sit in rows as they do in a motion picture theatre. Another difference is that unlike the CG-10A, in which pilot and co-pilot sit side by side, the cockpit of the CG-16 is set on top of the wing-like fuselage and is arranged in tandem.

Scoop for Bomber Loads

Built-in bomb hoists in AAF bombers have solved the problem of getting aboard the heavy bomb loads, but hoisting the bombs for external wing racks has necessitated the development of new devices. Latest experimental type is a four-wheeled hydraulic lift that literally scoops up the 2,000-pounders, raising them into position.



CG-16 Glider giant, shown below and at left above, has twin-boom construction with cargo compartments forming part of wing. CG-10A, at right above, can load six tons of aerial freight through split doors in fuselage rear.



on the line

with mechs around the world

Of steel construction, the lift consists of a large scoop-like platform that slides beneath a bomb and cradles it. A hydraulic jack mechanism then raises the bomb to its rack.



Hydraulic scoop lifts bombs to wing racks.

WHAT'S WRONG with the picture on Page 53

1. Take three men, subtract their goggles, and the result is frozen faces and eyes when they jump out into the sub-zero temperature of the high altitude.
2. You in the foreground—aren't you forgetting something? Overlook the 'chute and do your bailing out bare-back, and you'll have the dubious distinction of being the first one to land.
3. And doesn't your oxygen mask need a face-lifting? You won't get the proper oxygen supply if you wear it too low on your face.
4. Is you is or is you ain't—pushing? We're asking the man at the left who seems to be applying his weight to the waist door in what our gagman would describe as wasted effort. Stencilling on the hatch should clearly indicate that it may be opened by pulling inward.
5. There's no time for chivalry now, but nevertheless you do have your Mae West on wrong. It should be under, not over, the parachute harness.
6. Seems like a Mae West sister act with another one hanging over the waist door. That's no place for a lady!
7. The bail-out bottle tucked in your trouser leg will be of no use to you whatever unless the little tag is removed—so pull it out or you'll be playing tag with asphyxiation.
8. Now for the man who has succeeded in getting the other waist door open. He's preparing to leave the scene, but unless he connects his oxygen, he'll really be out of the picture.
9. For all practical purposes he might as well be on TD in a nudist's colony—what with his Quick Attachable 'Chute Harness unfastened, his parachute on the floor and his Mae West hanging around unescorted.

"What gripes me most of all," said T/Sgt. Arthur P. Beese, a B-17 engineer-gunner who participated in 30 missions over Europe, "is to see a flak-ridden bomber fight its way home, only to crack up in landing. Often it's merely a matter of brake failure due to a battle-damaged hydraulic system."

To help prevent such accidents, Sgt. Beese devised an emergency brake whose main feature is a pressure accumulator located near the brake drum and closed off from the hydraulic manifold by a stop valve controlled from the cockpit. In case of damage to the regular hydraulic system, the accumulator serves as an emergency pressure reservoir to operate the brake.

Charged with reclamation work at the keystone air depot of the CBI Air Service Command, M/Sgt. Dale K. George, Altoona, Kansas, found himself confronted with some unusually rough salvage missions when planes crashed in inaccessible regions and had to be brought back for rejuvenation or spare parts duty. As a veteran of 2½ years' service in India, Sgt. George is familiar with the terrain, and knows that it requires something special in the way of equipment. He therefore designed and constructed a salvage vehicle, fitted with a crane and winch arrangement, with which he is able to pick up and load almost anything anywhere. The apparatus has earned him a membership in the "CBI Service Chiefs," area honor society.

An important link in ground-to-air communication in fighter-bomber tactics is the SCR-522 radio unit—now maintained in prime operating fettle at a fighter squadron base in Italy by a home-made test set designed by T/Sgt. Raymond Washington. Constructed out of parts salvaged from wrecked planes and from scrapped radios, the tester makes it possible to give a quick, positive check on plate, grid, filament, relay and receiver voltages, as well as on the dynamotor noise ratio in a.c. voltages.

A dummy antenna connects to the SCR-522 through a coaxial cable, and is provided with an adjustable load and visual indicator to reduce the radiation of the radio frequency signal during tuning of transmitter and receiver. This device also denotes excess oscillation through a grid leak bias-type vacuum tube circuit and plate current relay, which can be adjusted to indicate a vibration level of .2 volts and up. A half-wave rectifier is built into the test set to supply power for the signal generator so that the use of batteries may be dispensed with. Voltages required are 110 v. ac or 24 v. dc, both of which can be supplied by field power units.



Credited with the design and construction of a number of weld assemblies in addition to towbars, cranes and special jigs, M/Sgt. William W. Johnston, Phillipsburg, Penn., is here shown instructing two assistants in the procedures he developed at his ASC depot in the India-Burma area.



A contributing factor to the efficiency of a 15th Air Force service squadron is this prop balancing stand built by S/Sgt. Samuel Calvert, Cove, Ark., (left); Norman F. Smith, E. Brady, Pa., (center) and Richard R. Ruff, Syracuse, N. Y., (right).



Two mobile runway control units are helping incoming pilots to land safely at domestic bases. Above, 1½ ton truck surmounted by glass-enclosed tower housing radio equipment was made at Peterson Field, Colo., while at MacDill Field, Fla. (below), a B-17's nose has been installed on top of a small truck. Both units are equipped with portable power generators, can be used as emergency towers.



BURMA RFD

(Continued from Page 23)

vividly remembers having Jap AA fire coming at him from above instead of below when they dropped supplies into a valley while the enemy was firmly entrenched on the hilltops.

Workhorse of most of these operations was the old standby, the C-47, but many C-46s were also used—and found very efficient. Carrying 40 percent more cargo than the C-47, the C-46s maintenance problems seem to have been licked, making it a popular plane on the Burma front. Loading crews developed their techniques to the point where they could load a C-46 in an hour and a half. At the advanced fields, where they traded their supplies for cargoes of wounded and enemy POW's, average time for turn-around was 30 minutes.

One day during the push I visited a C-46 base. It seemed to be mad confusion with Hindu laborers working on the taxi strips while planes took off and came in over their heads.

As a C-46 swung into the taxiway, the pilot switched radio frequencies and picked up the radio jeep on the field. He was told his exact parking area. By the time he reached it 10 truckloads of material were waiting, as was the gasoline truck and ground crew.

Before the engines were turned off, the first truck was backing up to the doors. As loading of the plane is the pilot's responsibility—weight and balance laid down in the TO must be supervised—there is no time to go up to the area for meals. So the squadron mess comes to the flyers in the form of mess tents pitched on the side of the runways and mess trailers serving hot food.

The original reason for starting Combat Cargo Groups was to set up streamlined, self-sustaining, expendable units to supply the Air Commandos in their operations in Central Burma. However the tactical situation changed to the extent where the tail wagged the dog—the Air Commandos were joined with the Combat Cargo planes to supply more transport planes and to do the tactical work. Now, in this type operation the only major difference between a Combat Cargo squadron and a Troop Carrier squadron is the fact that the former has more airplanes and fewer crews. For the Mandalay operation in the C-46 Group, it was necessary to increase the crews. About a hundred flyers were added. Twenty were P-38 pilots; twenty P-47 pilots; twenty B-24 pilots and twenty B-25 pilots. They all flew as C-46 copilots. In addition, 20 radio operators were borrowed from bomber outfits. To say that these men enjoyed this type of work would not be telling the exact truth. However all admitted they had never piled up so much combat time so quickly.

With these new types of organizations added to the older proven ones, the campaign in Central and North Burma came to a definite conclusion with the fall of Lashio and Mandalay. Organized Jap resistance in North Burma is finished—and the AAF's RFD had a good share in doing the job. ☆

GROWING PAINS OF JET

(Continued from Page 25)

wheel disc until 1937 and for turbine buckets until 1928. A British alloy, Ke-965, with a 1,200°-1,400° operating range then was used for buckets until 1933.

For 15 years after World War I, when funds were so scarce that only a few airplanes could be purchased each year, Doc Berger was the only Air Corps engineer working out the bugs of the turbo-supercharger, and trying to increase its efficiency to supply more and more air to the larger and larger engines being perfected. With Dr. Moss, he pleaded for funds—and as late as 1934 received an Army allocation of only \$7,000, although cost of a single turbo-supercharger was about \$25,000—and managed to keep the project alive with the help of about \$400,000 from General Electric's own research budget.

Men like Doc Berger don't come a dime a dozen. He is a practical genius whose favorite formula for getting work out of new men is to "scare hell out of 'em" by firing questions until the victims are squirming with self-consciousness at their own ignorance. After more than 25 years of constant work on the turbo-supercharger, Doc still bounces out of his chair like a rubber ball to engage in vociferous table-slaming discussions on gas turbine operation. With a sly, penetrating smile, he gives you the answers, then backs them up with reports and documents.

Sometimes Doc's ideas would get ahead of engineering practicability, but Opie Chenoweth, veteran civilian engineering executive of the power plant laboratory, was one of Doc's closest friends. "This team of the ingenious mechanic and the technical expert," in the words of Col. E. R. Page—military boss over both men at Wright Field until 1943—"was one of the nation's best. Although Doc wasn't an engineer in the academic sense, he always could depend on the technical assistance of Chenoweth who had the knack of channelling Doc's development work along sound engineering lines without discouraging his inventive genius."

Doc's contagious confidence and his intense interest in making better gas turbines many times inspired others to renew their efforts to perfect materials and designs for the turbo-supercharger. Just a few months ago, Dr. Moss succinctly summed up the importance of Berger's contributions in as strong a statement as he could make: "If it hadn't been for Doc Berger, the turbo-supercharger would have ceased to exist" . . . long before it was perfected for practical use at high altitudes.

Alloy research programs, instigated by Berger between 1926 and 1936, led to development by manufacturers of high-temperature metals that gave the turbo-supercharger the efficiency and durability required for operation with our largest engines and paved the way for the development of turbo jet engines.

In 1933, the Cyclops Steel Company's alloy was adopted for buckets that could operate at high temperatures. This alloy in 1937 also was adopted for use in turbine

wheel discs.

Later developmental programs led to the production of an alloy for buckets by the Haynes-Stellite Company, with operating high temperatures, and of Timken alloy for wheel discs by the Cyclops Steel Company, with operating temperatures in excess of 1,300°. These are the alloys now used to supercharge the engines of our Superfortresses at altitudes above 30,000 feet, and they are the ones being used for buckets and wheel discs in our turbo jet engines.

By early 1939, these high temperature alloys were operating satisfactorily in the turbine wheel. Thus, the main obstacle in turbo-supercharger development had been conquered.

But still the turbo did not give efficient performance, and that's when the new re-regulator and Robey test flight turned the trick.

Again it was Doc Berger, working with Lieutenant Robey (now a staff colonel in charge of all conventional and jet engine development for the AAF), who slaved at Wright Field for weeks to modify the turbo regulator for the critical test hop. But Doc Berger, who is solely responsible for the development of the supercharger regulator that made the 1939 flight test successful, already was preoccupied with another problem. Now that high temperature alloys were available, he was busy on a five-year program for developing the gas turbine as a prime mover to replace the reciprocating engine.

First step was to issue a contract to General Electric for a two-stage turbine, the first contract that might be construed as preparing the way for production of the turbo-jet engine two years later. Next, in 1940, a contract was awarded to Allis-Chalmers for development of a two-stage turbine wheel that could be geared to the driveshaft of a conventional engine, applying some of the turbine power to the propeller.

This adaptation, known as the "compound engine," was another Berger-Chenoweth step in the direction of harnessing gas turbine power. Still, this did not replace the reciprocating engine.

This was not accomplished until the spring of 1941 when the British flew successfully with the Whittle turbo-jet engine. The Army Air Forces through General of the Army Arnold, quickly obtained blueprints and an engine for examination and production.

With most of the basic problems already solved for mass production of gas turbine type units, General Electric modified the Whittle engine, and by the fall of 1942 began turning out its first models of turbo jet engines for the P-59 and later the P-80. Newer jet engines now emerging from the experimental stage in Britain and the United States are the best yet developed by any nation. They are the best primarily because of the special high temperature alloys that were developed during the long and tedious experimentation program with the hot wheels of the turbo-supercharger. ☆



Doughfeet shove liaison plane ashore at Pacific base. These little planes have evacuated wounded from otherwise inaccessible terrain, carried supplies to forward bases, spotted enemy troops, directed U. S. ground troops, directed bombers to enemy targets with smoke bombs.

The Unsung AAF

These are the planes that never fire bullets or drop bombs, planes that get shot at but can't shoot back, planes that have to perform endless, monotonous jobs without glory

Spraying long twisting columns of black smoke, a B-25 of the Far East Air Forces screens the movement of American men and equipment from Jap shore batteries. Screen also enables bombers attacking enemy positions to gain advantage of surprise.

In planes like these, the AAF has trained 184,394 men to become pilots in the years between Jan. 1939 and Jan. 1945.





Not bombs, but a packed rubber life raft is installed in the bomb shackles of this P-47 being readied to participate in a dawn attack on a Jap base in the Marianas. Flying with P-47 formation, this Thunderbolt will drop life raft to any fighter forced down at sea.

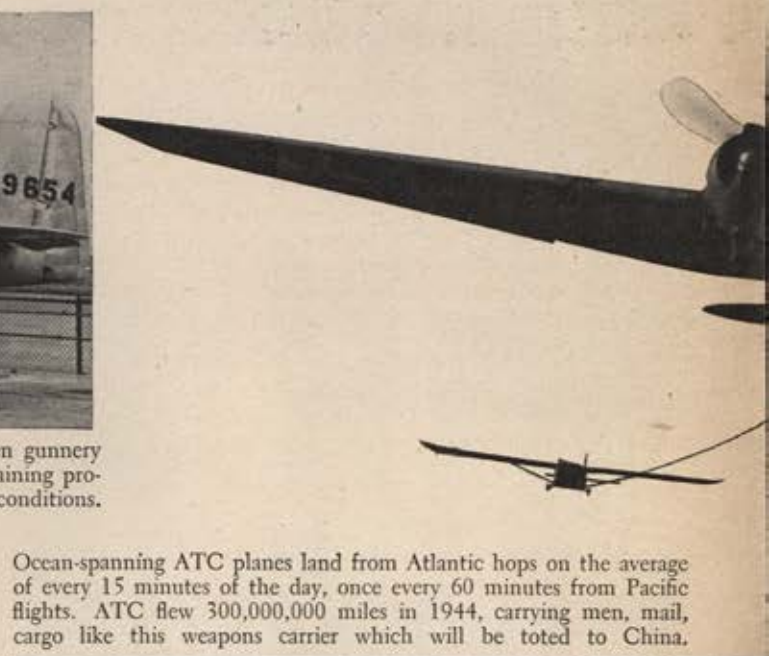


Swooping low over tent quarters on Saipan, C-47 sprays thousands of gallons of DDT insecticide in fight against malaria, dengue, filariasis and fly-borne dysentery. B-25s have been equipped to spray DDT over forward areas and engage in tactical missions on one flight.



"Pinball," the P-63 target plane shown above, blinks in pleasure when gunnery trainee pots it with frangible bullets. This recent addition to AAF's training program enables gunners to perfect their technique under simulated combat conditions.

Back of every military operation—ground, air or sea—is a picture. Getting the right kind of photos is a job that goes on day and night, when there's only a 600-foot ceiling over the Moselle, from 25,000 feet over Tokyo. Here film is unloaded from P-38.



Ocean-spanning ATC planes land from Atlantic hops on the average of every 15 minutes of the day, once every 60 minutes from Pacific flights. ATC flew 300,000,000 miles in 1944, carrying men, mail, cargo like this weapons carrier which will be toted to China.





Air-sea rescue squadrons have fished AAF men out of the English Channel, the Adriatic, the China Sea, the wide Pacific. Searches for missing men have continued as long as two weeks. Here downed Pacific airmen are helped aboard "Rescue Cat" (OA-10).



Weather planes first flew in the UK, now scout weather wherever AAF planes fly. Important missions often succeed because advance units find favorable weather at target. Weather crew shown above is checking equipment prior to mission over Germany.



Getting the "drop" on the enemy is more than a figure of speech in glider and airborne operations. More than 40,000 troops were put into action behind enemy lines by glider and paratroop teams during Rhine operation in March, 1945.

AAF's human pick-up system permits rescue of men in inaccessible terrain and behind enemy lines. Low-flying plane hooks nylon loop, picks up man with less strain than a parachute jump. This photo shows man pulled from ground by means of special harness.



Aerial wire-laying was achieved this year by ATSC and Signal Corps men who devised device, shown here on C-47, that can lay wire across any kind of terrain within 16-mile range in 60 minutes.

Speak to a medical man and he'll tell you that the big three life-saving innovations of this war are sulfa, blood plasma and air evacuation. In the six months after the Normandy invasion, 100,000 wounded were flown to England, 5,000 a month to U. S.



Rendezvous

(Continued from Page 46)

do not have information on exactly what the damaged plane contributed to the other. From the looks of things, it couldn't have been much. Like our readers, we're convinced it was a salvage job rather than a repair job.—Ed.

A Stepchild

Dear Editor:

Among many other officers and men at this base I am an ardent reader of *Air Force*. However, I would like to know if the Air Transport Command is part of the AAF. Although the ATC is frequently mentioned in the publication, its insignia is the only one left off the cover. We think we are doing our part over the Hump and throughout the China-Burma-India Theater. Don't you think the insignia deserves its place among the rest?

A Lieutenant in the step-child of the AAF.

A mighty big and lusty stepchild you have there, Lieutenant. Technically, ATC is a Command under the Commanding General, AAF, and therefore is represented by the shoulder patch insignia at the very top of the column on our cover.

Passing the Buck

Dear Editor:

I am sitting here in my office among my telephones and wall maps, when the call comes in.

"Hello," says the lady's voice. "I want to register a complaint against the Air Forces and if you don't do something about it I'm going to write my congressman immediately."

So I ask what's the matter and she says that ever since the AAF put radar on airplanes she has been having trouble, and they're not just ordinary troubles but great big ones. Especially at night. So I suggest she describe these difficulties that our restricted and secret radio apparatus cause and she goes on as follows.

"When the airplanes fly over my house they turn on their radar and then I have a

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

- | | |
|------------------|----------|
| 1. C-60 Lockheed | 6. No |
| 2. Three | 7. Two |
| 3. Clark | 8. Three |
| 4. One | 9. One |
| 5. Five | 10. Yes |

CORRECTION: Anticipating complaints, we wish to call attention to an error in the May issue of "How Sharp Are You?" At the last moment No. 4 question and answer were changed. Due to a production slip-up, only the answer was changed in the magazine. Question No. 4 should have read, "What plane has the figure 7 on it?" The answer, second plane, is then correct.—ED.

TONY, NICK AND OSCAR 2

(Continued from Page 17)

can attest to its maneuverability. The Oscar Mark 2 can outmaneuver the Zeke. The Oscar Mark 2 also has armor plate and leak proof tanks, an indication of the extent to which the Japs have improved their aircraft.

With all these advantages, why do our fighter pilots and laboratory analysts insist that we have better combat planes? One important reason is that the firepower of the Oscar Mark 2 is relatively light. Its entire armament is two 12.7 mm machine guns synchronized through the nose cowl. While it does have leak proof tanks, the protection provided is makeshift at best, for the usual covering is nothing more than kapok fastened to the tanks. And its armor consists of a 13 mm headplate and backplate for the pilot, with no other protection.

Another reason is that our planes can take a terrific beating and still continue to fight. We have superior firepower, more and heavier armorplate, and leakproof tanks of superior construction. Perhaps outweighing these technical advantages is the fact that American pilots can think better and quicker than the Japs.

The Tony is a single-engine fighter with an inverted V liquid cooled engine and a top speed of about 360 mph at 15,000 feet. While it is the fastest of the three fighters, it is still slower by some 40 mph than the P-38G and slower by about 75 mph than the P-51C.

Its best rate of climb is at 5,000 feet where it rises at about 2,500 feet per minute. At that altitude, the 38G outclimbs it by at least 300 feet per minute, and the 51C goes up by about 700 fpm faster.

Its best characteristic is its diving speed. One of the early tactics employed by P-40s against the Japs was to make one pass and dive away. Previously, the Nips could not or would not dive with the Warhawks. However, in simulated combat against Tony, a P-40 dove at 475 mph and the Jap stayed with it.

The Tony also has respectable firepower. Tonys have been captured with three different versions of armament. One has two 7.9 mm machine guns and two synchronized 12.7 mm machine guns; another has four 12.7s; and yet another has two 12.7s and two 20 mm cannons.

The armor plate on the Tony consists of a 10 mm backpiece and a 14 mm headpiece, with no other protection. In addition to leakproof tanks in the later versions of the Tony, some carry protection on the oil and coolant radiators.

Returned pilots report that the defensive tactics employed by the Tony are very effective. Seldom is a good target presented. The principal evasive measures taken by the Tony are either to half roll and go straight down, or, in the case of a deflection shot, to turn in and under our planes. In the opinion of these pilots, the Tony is the best all-around Jap fighter plane.

The Nick is a twin-engine two-place tandem day and night fighter with a radial air cooled engine and a three bladed propeller. Its top speed is approximately 345

mph at 21,000 feet, about 50 mph slower than the P-38G at that altitude.

The best characteristic of the Nick is its heavy firepower. Here the Japs have really departed from their former ideas and added a 37 mm cannon in the nose. The Nick also carries a 20 mm cannon in a bulge underneath the right side of the fuselage and a 7.9 mm flexible machine gun in the rear cockpit. The 37 mm cannon operates on recoil and moves rearward approximately one foot. A heavy compression spring around the barrel and a hydraulic cylinder absorb the recoil. The magazine holds approximately 20 rounds and cannot be re-filled while the plane is in flight. Its effective range is about 300 yards.

The early edition of the Nick protected the pilot with a quarter inch thick armor plate backpiece and a three-eighths inch thick headpiece. Later versions added a 10 mm plate under the seat and a 12.5 section around the cannon in front of the pilot. The rear gunner, however, is protected only by insurance.

Combat reports indicate that the Nick is duck soup as a day fighter despite its heavy firepower. It is the least maneuverable of the three Jap Army planes and, without that advantage, its fixed firepower becomes less effective. Above 5,000 feet, its rate of climb starts to fall off rapidly and its speed, at any altitude, cannot begin to match our fighters.

One strange feature of the Nick is the fact that the rear gunner fires both the 20 mm cannon situated underneath the right side of the fuselage, and the flexible gun. It is obvious what a coordinated attack upon his position will do to his general status of well being.

Experts who are acquainted with Japanese aircraft are faced with a paradox that has not been answered satisfactorily. The Jap Navy's Zeke 52, a later plane than any of the three Army types, does not carry armor plate or leak proof tanks. The Oscar Mark 2, Nick, and Tony, completed before the Zeke 52, have those essentials.

There are two possible answers to this riddle. One is the fact that there seems to be a serious lack of coordination between the Jap Army and the Jap Navy. Second, the Japs have not been able to make important changes in their planes after they get them into mass production.

In summation, the three Jap planes noted here have a few excellent characteristics and many serious disadvantages. The Jap is improving, witness the new 400 mph Frank I, but he has not yet been able to match our aircraft. ☆

PICTURE CREDITS

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AIR STRATEGY IN LUZON

(Continued from Page 10)

any enemy activity that chanced to meet the eyes of our recon pilots. More than 1,800 sorties were flown against bridges, roads, buildings, shipping and factories.

In the record was a request from one of our ground commanders that planes cease destroying locomotives and rolling stock before our own extended supply lines suffered for lack of salvaged enemy railway equipment. Another ground commander had wondered jokingly why our planes couldn't "just blast the center spans out of bridges without blowing up the revetments 100 yards away and ripping up 300 feet of good concrete highway."

For the period, our losses had been extremely low: 26 fighters and 38 bombers destroyed or missing.

The battle for the southern section of Manila had entered its tragic stage of bloody, building-to-building, floor-to-floor fighting and wanton destruction by disorganized, fanatical Jap troops. Most of the larger buildings had been used as enemy arsenals, and when the stubborn defenders were driven from one after another they set off charges that laid waste blocks at a time.

One Allied demolition expert, who had served in the Mediterranean theater, said the explosions that rocked Manila were never equalled in Italy, not even at Cassino.

While our forces from the north pushed across the Pasig River, other troops entered Manila from the south after a successful landing on West Batangas and an airborne operation on Tagaytay Ridge.

Manila finally fell on March 2. By the time the city was securely in our hands, the Japs on Luzon were left without any capability for offensive operations. But the enemy commanders were quick to make the most of defensive delay by withdrawing all forces to the rugged terrain east of Manila, to Batangas south of Laguna De Bay, and to the mountains guarding the approaches to the Cagayan Valley in north Luzon.

This enemy defense has called for the closest air-ground coordination. Our bomb-carrying fighters have gone in time and again only a few yards ahead of our ground troops to blast the Japs out of caves and natural barriers.

The commanding general of one division reported he had "never seen such air cooperation, and up to this time I did not think it possible." Another commented that "our troops have entered areas standing up and smiling."

On March 16, when the battle for Luzon had settled into a stage of slow progress against final desperate defense, Gen. Walter Krueger told General Whitehead that the cooperation of air units with the 6th Army "is superb and is assisting materially in the taking of our objectives and in holding our own battle casualties to a minimum."

As in Europe, air power in the Philippines had many times proved its indispensability.

Without it, the Jap on Luzon was lost; with it, Allied forces pressed on toward final victory in the Far East. ☆

BENEATH THE RUBBLE OF SCHWEINFURT

(Continued from Page 6)

through the mountains of shattered masonry and twisted steel of the giant Kugelfischer plant. These were the remains of the largest ball bearing factory in Germany. A few streets distant we could see the bomb-pocked buildings of Fichtel and Sachs whose ball bearing shops were part of the Vereinigte Kugellager Fabriken (VKF) plant. Kugelfischer and VKF between them accounted for most of the ball bearings turned out in Schweinfurt. Altogether, the town had shuddered under the impact of 16 bombings, during which American aircraft dropped more than 6,500 tons. In addition, the RAF had paid two visits with sizeable forces, but we were particularly interested in the effectiveness of the first two American assaults and wanted to know if the damage done had justified the cost in bombers and men.

One of the first persons we talked with was a factory manager at Kugelfischer. He admitted the first two attacks caused considerable destruction and that production slumped appreciably for several weeks. He was evasive, however, when pressed for an exact assessment of the loss in output. Apparently he still had faint hopes that the Wehrmacht could pull victory out of the fire, for he even tried to conceal the location of an underground wing of the factory while being interrogated by our military engineers. Workers and people living in the neighborhood of the factory were considerably more voluble. They told how the first assault caused consternation among Nazi officials who had been led to believe that Schweinfurt's location deep in Germany made it immune from air attack. The workers said no adequate shelters existed at the time of the first bombing, and the physical damage added to the fears of the laborers regarding future raids precipitated a major decline in output. Accurate appraisal of production losses must await study of the factories' ledgers and bills of lading, most of which were captured intact, but the best evidence available so far indicates that the initial attacks paralyzed the production of Schweinfurt's ball bearing industry.

By the end of 1943, the damage at Schweinfurt had caused Germany's entire ball bearing manufacture to slump to about 70 percent of its former volume. In 1944,

as the Schweinfurt campaign continued, the Germans desperately tried to protect their concentrated industry by moving part of it underground. Work was commenced on huge subterranean shops and shelters. Additional slave labor was imported to speed the project. These workers came from Russia, Italy, Poland, France and other

regions, and for a time they apparently received reasonably decent treatment. Some of those who had been liberated with the capture of the town reported that the Germans fed them fairly well to keep them sufficiently strong for long hours of heavy labor. At Kugelfischer there was an elaborate plant below the surface of the ground protected by a concrete roof six feet thick. It was planned to move the entire works underground, but shortage of building materials forced abandonment of this scheme.

Meanwhile, Germany tried to bolster her diminishing ball bearing supplies by increasing imports from Sweden and Switzerland and by substituting flexible joints for ball and roller bearings. These efforts didn't help very much. Neutral shipments fell off to a thin trickle and the Nazis continued to rely on their battered Schweinfurt factories for their main source of supply.

By midsummer of 1944 the pinch was being felt. The shortage of bearings was reflected in the quality of some of Germany's tanks and aircraft engines. American aircraft were swarming over Germany seeking to paralyze the enemy's communications. By prodigious efforts the factories were continuing to make ball bearings but now the problem was how to get them out of Schweinfurt. Rail freight was a precarious method for no train was ever certain of reaching its destination. Highway transport was a slow and equally risky haul. This spring the situation became so acute that some of the Kugelfischer and VKF bearings were carted away in passenger automobiles and horse-drawn carriages. Scattered around the plants were hundreds of barrels filled with bearings of all sizes. They were crusted with rust for there had been no way of transporting them to where they were needed.

Even the most casual inspection indicates the air forces had done their work well in Schweinfurt. Their purpose was to disrupt a vital industry and they came close to doing it in a little more than a dozen tries.

One of the first acts of the 42nd Division infantrymen upon entering the town was to haul down the Nazi flag at Kugelfischer. Maj. Gen. Harry J. Collins, the division commander, turned it over to us to give to General Carl A. Spaatz, Commanding General, U. S. Strategic Air Forces in Europe.

Said General Collins: "I want this flag to go to the 8th Air Force group that suffered the biggest losses in the Schweinfurt campaign. The air has done a great job here and the Rainbow Division would like them to have this memento from the Infantry. I think we have avenged their losses." ☆



Maj. Gen. H. J. Collins (right), CG, 42nd Inf. Div., and Brig. Gen. H. Linden with flag they presented to 8th AF group suffering heaviest loss on Schweinfurt missions.

VICTORY IN EUROPE

(Continued from Page 7)

the officers' club at one of the oldest heavy groups in the ETO, the group S-2, a major with iron-gray hair and service stripes of World War I above this war's bars on his



sleeve, tried to find the right words. He said: "I hope none of you guys will ever let anyone disparage the U.S.A. while you're around. Not even Americans. We all know we come from a good country, but most of us fail to realize how stupendous our achievements have been. Three years ago, militarily speaking, we had nothing. Today, with our Allies, we have smashed the deadliest menace—and the most powerful military machine—that the world had ever known. There it lies, rotting, in the stench of Dachau and Nordhausen and Buchenwald..."

He hesitated, and a second lieutenant who looked about 19 said, "Go on, pop."

"There's enough glory in this victory for all the Allies," the major said. "Without the Battle of Britain, and without Stalingrad, we couldn't have brought our power to bear. But without us the British and the Russians could never have pulled the Nazis down. And when you think that in the same short time we've sunk the Jap Navy and put a hundred carriers in Hirohito's front yard, without even seriously dislocating our civilian economy, why then the power of the United States of America seems fantastic. It's not conceit to recognize the fact. It's our duty and our job to recognize it, and maintain it, and direct it toward the good of the world. For God's sake, let's not go home after we've finished the Japs and decide we can get along without the rest of the world. Even if we could, the rest of the world couldn't get along without us." He stopped suddenly and looked around sheepishly. "Hell," he said, "I'm sorry. I talk too much."



A tall flyer drained his glass thoughtfully. "It makes pretty good sense to me," he said.

That was one reaction, but such self-expression was rare. So were prolonged demonstrations or celebrations among AAF personnel. Generally speaking, the more recently operational an outfit had been—and the closer to the front—the less hilarity there was. Perhaps the men were too tired. Perhaps they had too much to remember. Perhaps they simply felt, as one soldier put it, that it was a good day for the civilians

to celebrate.

The civilians did—in most of the capitals of Europe, in Paris and in London particularly. In Paris, just before three o'clock on Tuesday, the crowds began to swarm into the Place d'Opera. The news had been broken in French newspapers the day before, to the anguish of Allied correspondents still muzzled by SHAEF censorship. In front of the Opera the sun was bright on the flags of many nations. Jeeps crawled through the crowd literally smothered by people, moving mounds of men in uniform and girls in bright dresses and crazy hats. A truckload of German prisoners, smiling rather arrogantly, was booed by the crowd and the guards waved their guns. But the people were too happy to be a menace, unlike the crowd of the previous day that had watched in angry silence some prisoners munching American rations.

Girls threw their arms around perfect strangers and kissed them on both cheeks. GIs kissed girls, usually on the mouth. Nobody resisted very fiercely. The cafes were jammed, and people did funny little dances in the street.

A correspondent asked a 9th Air Force captain wearing two DFCs whether he thought so much gaiety was in order when men were still fighting and dying in the Pacific. "Good Lord, yes," said the captain. "If the Pacific War had ended with me trying to strafe some Jerry ammunition train, I'd have wanted those guys to have the best damn party on record. Some of my old gang are out there in the Pacific now. I bet when they're through with today's fighting they'll hoist one or two for me—if they have it to hoist."

In London, the city that had endured without flinching the Blitz, the buzz bombs, and the rockets, enthusiasm could not wait for the official announcement. By Sunday the city was decked with flags and pennants, the British colors contrasting oddly with the dingy unpainted windowsills and the skeletons of blitzed houses. It was as if a tired old lady had suddenly decided to put gay ribbons in her hair.

On Monday night the crowds swarmed down Piccadilly waving flags, and singing everything from Tipperary to Old MacDonald Had a Farm. They climbed lamp-posts and danced on the roofs of buses. The city was relatively dark that evening, but the next night—Tuesday—floodlights blazed around St. Paul's and Buckingham Palace. At the palace a vast crowd waited patiently to hear the king's speech. A couple of restless Mallards kept circling the palace, wings whirring, and once a C-47 went lumbering across the sky. When the royal family finally appeared on the scarlet-draped balcony, a roar went up like the sound of surf in a northeaster.

At that same moment the silence must have been deafening in the ruined streets of Kassel and Schweinfurt and Berlin.

From then until dawn the crowds milled through the streets of London. The only solemn people were the MPs, wistfully dignified in all the bedlam. There were flaming torches along St. James, and the girls with paper hats captioned laconically, "Adolf, you've had it."

Vendors sold flags and tri-colored rosettes. Even the dogs wore red-white-and-blue ribbons in their collars.

London was colorful that night. She welcomed, as best she could, the American airmen who had helped bring her the victory. The Red Cross clubs would accept no money for food or drink that night: everything was on the house. AAF men who were lucky enough to be there will never forget it.



But they, after all, were only a handful out of nearly half a million men scattered over Europe, all members of the same AAF team. In the prison camp at Moosburg, Germany, there still were American flyers waiting to be transported home, men who

had been shot down over Paris, over Brunswick, over the flaming refineries of Ploesti, of Bohlen, of Magdeburg. For them the war ended the day American tanks poked their armored noses through the barbed wire that had held them captive. In the hospitals, too, were airmen scarred by flak or frostbite, some still bed patients, some ambulatory in their red army bathrobes. For them the war had ended the day they were hurt. For them the next great day would be when they came home.

All of which is another way of saying that it's impossible to generalize about the impact of V-E Day upon individuals. It's true, for example, that the pubs and cafes and bistros of Europe were full of uniforms, but so were Notre Dame and St. Peter's and St. Paul's. It's true that the ending of war in Europe left some of the participants curiously unmoved, but to others it was a profoundly emotional experience.



We were sitting in the snack bar of a Red Cross club in London in the small hours of V-E night, drinking coffee by this time. We had been talking about the war in the Pacific and how long it might last. Some said they'd just as soon go on out there and some said they'd rather not and most of us agreed we'd end up there in any case. ☆

Rendezvous

(Continued from Page 60)

hard time hearing my telephone. It also makes my bedsprings squeak and the radiators get noisy. But that's not the worst of it. The radar rays are killing all the fir trees around the house. I have been patient about this but I can't stand it any longer and so if you don't do something to relieve the situation I'm going to write my congressman to investigate. I might add that it's not the fast planes that bother me—it's the slow ones. The slow ones kill my trees much faster."

I hang up the telephone and wonder where our civilization and magic things like radar are leading us. But we can't talk about radar, I say to myself, so I call the Navy and tell 'em it's their pigeon because Navy planes fly over this lady's trees.

Maj. Erwin G. Morrison, Hq. 4th AF



HOMER



AIR FORCE MAGAZINE

"... and the next time you're AWOL, you'll go in to the old man on a slab of toast!"

Answers to Quiz on Page 46

1. (B) FW190-JU88
2. (D) Snatch
3. (C) \$600,000
4. (B) S-2
5. (D) \$500
6. (B) Was the target of air-sea bombing experiment
7. (C) Quotient of a plane's true airspeed divided by the speed of sound
8. (D) Surveying or mapping by aerial photography
9. (C) Proving Ground Command
10. (4) Jul-Oct
11. (D) A German jet-propelled aircraft
12. (A) 15 minutes
13. (C) Advance echelon
14. (D) An aircraft with flapping wings
15. (C) Saipan
16. (D) Contraction of jagdbomber, German for fighter-bomber
17. True
18. (C) As "Z" indicates Greenwich time, it would be 9:01 at Birmingham which is in Central Time Zone
19. (C) 14th Air Force
20. P-61

FROM DUSK TO DAWN

(Continued from Page 13)

The distant rumbling of artillery told him he was still close to the lines. After 10 hours he reached a town, which, except for two houses whose chimneys were smoking, seemed deserted.

Cautiously, he made his way to one of the houses. Peering through the window he saw two American soldiers seated at a table drinking coffee. When he entered, the soldiers were ready to shoot him on the spot. It took some fast talking to convince them that he wasn't a German in American uniform.

Bielinski, who bailed out immediately after Stipick, also walked cross-country in a westerly direction. Finally after he had hiked for hours, a challenging American voice rang out: "Halt! Who's there?"

"American pilot!" Bielinski shouted back. "Advance, pilot, and be recognized."

Bielinski stepped forward and found himself looking down the barrel of an M1 held by a determined-looking sentry.

"What's the password?" the sentry demanded.

"Don't know it," the pilot confessed.

The sentry took a firmer grip on his rifle.

"What outfit you from?"

"155th Photo-Reconnaissance Squadron."

"Never heard of it," the sentry said.

"Stand where you are or I'll plug you."

There was some more palaver and the sentry finally marched him to a nearby command post where an infantry captain asked Bielinski to produce his AGO pass.

"I never carry one in an airplane."

"How about dog tags?"

The pilot handed them over, but the captain still wasn't satisfied.

Fortunately, Bielinski was rescued a few hours later by an Air Forces lieutenant who happened to be visiting the area. It turned out that the lieutenant had graduated from the same flying school.

Enemy night fighters present another hazard. As a rule, the A-20s can dodge them by evasive tactics, particularly if there is no moon. Occasionally, however, the fighters can cause a lot of trouble. One photo plane came back with 45 bullet holes in its fuselage after a brush with the interceptors.

On another night, Bielinski was chased from his target by several ME210s. As he ran for home, the voice of the ground controller came through his ear phones imploringly: "Can't you go any faster? Six of them are closing in on you."

Bielinski poured on the fuel, and barely set the wheels down on his runway ahead of the pursuing fighters.

There are other incidents such as the one that netted Aerial Gunner Jack Holden the Purple Heart for a pair of broken ankles. Holden was in the turret one night when his plane was surprised by an enemy interceptor. The pilot threw the Havoc into a steep dive from 8,000 feet. He didn't pull out until the plane was just above the tree-tops, and the A-20 levelled off with such an excess of Gs that the gunner's ankles snapped like matchsticks.

Then there was the time that 1st Lt. Robert L. Anderson was coming across Chalons. Suddenly his navigator warned him that tracers were arching over the plane. Anderson put his plane into violent evasive tactics, but wherever he twisted and turned tracers continued to criss-cross his path. Eventually, he managed to escape. When he landed, he was convinced the Luftwaffe's entire night fighting force had tried to bring him down. It developed, however, that he had flown directly over an exploding ammunition dump.

Colonel Philbrick says that a night-photographic outfit's prime targets are enemy movements and activities, and that its operators should supplement rather than encroach upon those of a day-reconnaissance squadron. The Colonel believes that night photography of fixed defenses is justified only in relatively rare situations. Normally, he says, our daylight reconnaissance tells us what the enemy has; night reconnaissance tells us what he is trying to do with it under cover of darkness.

The A-20s of the 155th are adapted for both the high-voltage flash and the M46 photo-flash bomb. The high voltage flash, developed by Dr. Harold Edgerton, is a means of illumination that is fixed to the airplane. It is used only when pictures are taken from low altitudes. One of its advantages is that the negative does not pick up any shadows, thus making it ideal for photographing wooded areas.

The photo-flash bomb, which emits an 800,000,000-candlepower light, is used for higher altitudes. The flash of the exploding bomb activates a photo-electric cell which trips the shutters of the K19B cameras.

Some of the early missions showed that the flash bombs were exploding too far behind the airplane to give the cameras sufficient light. 1st Lt. John Keane, of Dobbs Ferry, N. Y., solved this problem by refashioning the angle-trail plate of the bomb, thereby causing the bomb to fall at a reduced trajectory.

Capt. Joseph F. Condon, of Philadelphia, one of the photographic officers, suggested the installation of two cameras in each plane, one focused 14° to starboard, the other 14° to port. Experiments proved that this method permitted the photographing of a considerably wider area, thus compensating for slight errors in navigation over a small target.

Early experience also showed that the maximum light of the photo bombs was reaching the cameras after their shutters closed. To remedy this, Colonel Philbrick assisted in designing a device that delayed the action of the cell to insure the cameras' receiving the peak light of the bombs.

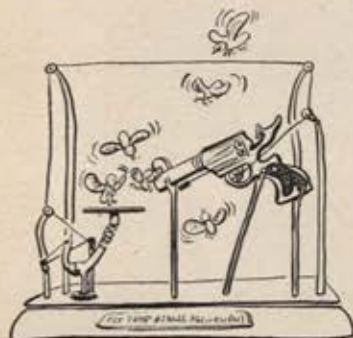
According to the Colonel, final perfection of the art of night photography still necessitates long-range experimentation extending over many months.

"This experimentation should not be tackled in a theater of operations," he says, "but referred to proper development agencies in the United States. ☆

SHOOTING THE BREEZE



Marianas. 2nd Lt. Waldo McCorkle was doing his bit as an A-3 officer when one day he went a little daft. McCorkle estimated that he had filled out 10,000 reports—more than anyone could possibly read. Ahead he saw nothing but more reports, so he decided to make a test to see if his reports were ever read. With a strange light in his blue eyes, McCorkle drew up a floor plan of the local enlisted men's mess hall and drew three small circles which he labeled Fly Trap No. 1, Fly Trap No. 2, and Fly Trap No. 3. Space on the report was provided for this information: Total flies caught from . . . to . . . Flies previously reported . . . and Total flies to date The lieutenant then mimeographed this form. He filled in the spaces and placed this form on the top of his stack of official reports. This batch was sent along, through channels, fly figures and all.



Several months went by and then it happened. An officer of another outfit on the post called McCorkle on the telephone. "What is all this fly report about?" he asked, his voice showing deep concern. "Our CO just got word from Washington wanting to know why we aren't on the ball. We must have lost the directive on that fly report. Can you give us a little help?" McCorkle's own CO was roundly congratulated for having such alert officers.

USA. It happened at the Aircraft Mechanics School at Lowry Field, Colo. A student engineer was up for his first flight. The lad was sitting in the copilot's seat, anxiously watching everything, and nothing in particular. Suddenly the pilot said, "Feather three." Eager to please, the student engineer asked, "Which three?" Rumor has it that the young man is now doing well in the ground forces.

England. The officer in the control tower answered every requirement of a smart aleck. He was fast on the tongue and no

GOT ANY GOOD STORIES? SEND 'EM IN!

pilot, on or off the air, had ever been able to top him. One airman, however, decided to catch the wisecracker off guard.

While flying in the vicinity one day, the pilot called the tower, "This is X-X670 OK at 40,000 feet. Give me instructions for landing."

Without a moment's hesitation the character in the tower snapped back: "Shoot off another rocket, Buck Rogers, then go around again. You're number six in the pattern."

CBI. The old saying that only one shell or bullet has your name on it was disproved in the case of Lt. Randy Owen of the First Air Commando Group recently. While flying a particularly hazardous mission over Jap-held Burma, Lieutenant Owen's P-47 suffered quite a few bullet holes and was even hit by a 20 mm shell which lodged in the wing and failed to explode. After returning to his base, his ground crew proceeded to repair the damage and extract the unexploded 20 mm shell from the wing. After this delicate job was accomplished, Lieutenant Owen was amazed to find in English the initials R. O. neatly stamped on the shell casing.

Burma. Cpl. Jonas Harschel who served with the 679th Signal Warning Squadron in the Naga Hills had a way about him with native head hunters. At first the squadron approached villages with extreme caution, reminding stragglers that they were in danger of being sautéed. On these occasions, when the suspicious, well-armed natives came out to meet the signalmen, Corporal Harschel broke out his portable phonograph, cranked it, then put on a record which proved its worth many times, Gene Krupa's "Jungle Madness."

"Those savages know a real drummer



when they hear one," Harschel explained. "The tom-tom seems to send 'em."

Philippines. This episode has little significance beyond the fact that it is reported by one of our staff correspondents who happened to be on hand, he claims, when the incident occurred.

An LST which had been en route several weeks was nearing the action zone for the invasion of Leyte. The usual crap game was in progress below decks and the Officer of the Day, realizing that the troops would have to be alerted soon, ordered one of the guards to go down and break up the game.



Some 30 minutes later, with sounds of the game still evident, the OD made a personal investigation. He found his guard, bills entwined in the fingers of his left hand, preparing to roll the dice with his right.

"I thought I told you to break up this game," the officer said.

"I'm doing the best I can, sir," the guard replied. "But I only had a buck to start with."

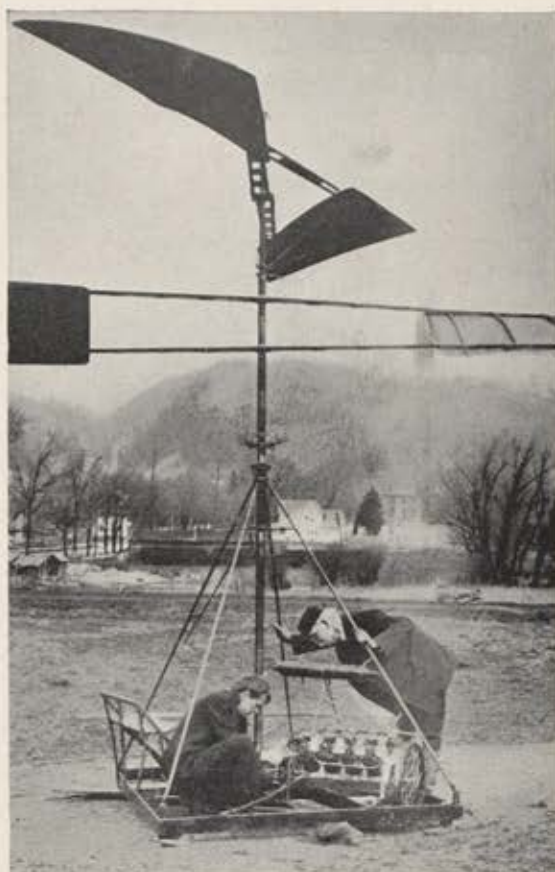
Italy. Sgt. Joe Hegdahl, former member of the Minneapolis Fire Department, took great pride in his civilian profession and often told of his experiences with smoke and flame. Then, one day, Sergeant Hegdahl returned from work on the line to find his own tent ablaze. The sergeant, in a lapse of attention, had hung a freshly washed shirt over a ten-gallon oil drum stove, hoping to find it dry when he returned. Instead, he found it had burned and ignited his tent. Amazed and a little chagrined, the sergeant dashed inside to salvage his girl's picture. Beating his way through the flames, Hegdahl grabbed what he thought was the photograph and escaped unburned. As the tent collapsed behind him the sergeant discovered one more error. He had not rescued his girl's portrait—but a copy of the National Fire-Fighters Weekly. ☆

The Album

EARLY ENGINES



1910. We are told that the mustache and pipe at left belong to J. F. Cooley, who is shown backed up by a Cooley airplane. The young buck at right is holding up or being held up by a 2-cycle 60 hp Elbridge engine.



1916. Mr. J. Newton, who appears to have donned his thinking cap for the occasion, speaks a few kind words over a recalcitrant engine which he and his playmate hoped would start these helicopter blades whizzing.



1914. Grease monkeys of the 1st Army Aero Repair Shop at San Diego are shown at work on some new-fangled engines.



...there's still
a lot
of fighting
ahead...