

AIR FORCE

OFFICIAL SERVICE JOURNAL

OF THE U. S. ARMY AIR FORCES



Formerly
**AIR FORCES
NEWS LETTER**

DECEMBER 1942

WAR DEPARTMENT
HEADQUARTERS ARMY AIR FORCES
WASHINGTON, SEPTEMBER 6, 1942

A.A.F. REGULATION)
NO. 5-6)

PUBLICATIONS AND REPRODUCTION

AIR FORCE - Official Service Journal of the Army Air Forces

(This Regulation supersedes A.A.F. Regulation No. 5-6, November 1, 1941)

1. Establishment

The official service journal of the Army Air Forces is hereby established to be published monthly by the "AIR FORCE" Editorial Office located in New York City, with the following general purposes:

- a. To disseminate unclassified information of technical and professional interest to personnel of the Army Air Forces and allied activities.
- b. To advise Army Air Forces personnel of organization changes, revisions of policy, and items of general current interest.
- c. To stimulate high professional standards and "esprit de corps" within the Army Air Forces.

2. Name

The official name of the journal is AIR FORCE. This name supersedes the former designation of AIR FORCES NEWS LETTER.

3. Field Relations

In the necessary relationships with the field:

- a. Direct communication is authorized between the AIR FORCE Editorial Office and other Army Air Forces personnel, and vice versa, on matters of editorial content, circulation and distribution of AIR FORCE.
- b. Station commanders will designate a suitably qualified representative as AIR FORCE correspondent, who will be charged with preparing and forwarding material for publication in AIR FORCE.
- c. All Army Air Forces personnel will be encouraged to submit directly, or through their station correspondent, articles on any phase of military aviation or other allied subjects believed to be of general interest to readers of AIR FORCE.
- d. All material published in AIR FORCE will be approved for inclusion and dissemination by the War Department, Bureau of Public Relations.

4. Circulation

It shall be the responsibility of the AIR FORCE Editorial Office to control and direct the circulation of AIR FORCE, and to prepare necessary instructions to station commanders and others responsible for bulk and individual circulation as may be required from time to time in order to make copies accessible throughout the Army Air Forces and allied activities.

5. Certification

Each issue of AIR FORCE shall bear the notation that it is printed with the approval of the Bureau of the Budget, Executive Office of the President, as required by Rule 42 of the Joint Committee on Printing.

By command of Lieutenant General ARNOLD:

GEORGE E. STRATEMEYER,
Major General, U.S. Army,
Chief of the Air Staff.

OFFICIAL:

WILLIAM W. DICK,
Colonel, A.G.D.,
Air Adjutant General.

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AIR FORCE

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



A Smart Man's War



PAUL REED

THIS is a smart man's war, being fought against a cunning and intelligent enemy. It is a fast moving war that forces all of us to keep abreast of day by day developments.

We must learn all we can, not only about our own job but about the other fellow's job. We are called upon to be specialists and at the same time achieve versatility. To accomplish this dual objec-

tive we must study new methods, new techniques, new roads to victory. Never before has the individual soldier been called upon to demonstrate such intelligence and resourcefulness, not only in the combat zone but also in the rear areas.

The best way to keep pace with new techniques of war is through the free exchange of ideas and information. When our air force was small—so small that we knew each other by name—this was a comparatively easy task. But now that we are building the largest military aviation machine the world has ever known, the job becomes increasingly difficult.

It is gratifying that out of a little service bulletin, which originated almost a quarter of a century ago, has come this modern service journal to foster the exchange of ideas within our expanding Air Forces. I encourage each one of you to read it regularly, and use it as a medium of expression.

At the close of the first year of war, I welcome this opportunity to congratulate you on a job well done, and at the same time impress upon you the need for even greater efforts for the task that confronts us. We have already conquered what seemed to be insurmountable odds. The future challenges us to rise to even greater achievement.

H. H. Arnold
 H. H. ARNOLD,
 LIEUTENANT GENERAL, U. S. ARMY,
 COMMANDING GENERAL, ARMY AIR FORCES

FORMERLY THE AIR FORCES NEWS LETTER

AIR FORCE is printed each month by authority of Army Air Forces Regulation No. 5-6, Sept. 6, 1942, and with the approval of the Bureau of the Budget, Executive Office of the President. AIR FORCE is published by the U. S. Army Air Forces at the AIR FORCE Editorial Office, 101 Park Avenue, New York City; Tel., MUrray Hill 5-1951; Teletype No. NY 1-2530; Director, Major James H. Straubel, A.C. Direct communication with this office has been authorized on matters of editorial content, circulation and distribution of AIR FORCE. Army field publications may reprint from AIR FORCE without permission.

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AIR FORCE is primarily a medium for the exchange of ideas and information among Army Air Forces personnel. Opinions expressed by individual contributors do not necessarily express the official attitude of the Army Air Forces or the War Department.

HERE'S HOW WE GOT THIS WAY

By Major Falk Harmel

HEADQUARTERS, ARMY AIR FORCES

YOUR service journal, AIR FORCE, looks brand new. Actually, it is an old standby which made its solo hop 24 years ago. And each year since, with but one exception, it has remained on "flying status."

The first issue, back on September 21, 1918, was a typewritten, mimeographed, four-page "Weekly News Letter." The name later was changed to Air Corps News Letter, then Air Forces News Letter. Now it is AIR FORCE. The format, likewise, changed. It remained a typewritten, mimeographed publication until July, 1941, when the varitype-multi-lith reproduction process was adopted. Flat color was added for the first time last February but the same printing method was used up to this issue.

As in aircraft, the designs and type names have changed, and range and size have increased. But a service journal becomes no more obsolete than plane types become obsolete. Thus, the complete and colorful history of the Air Forces for the past 24 years is to be found in the yellowed and worn copies of old News Letters, just as new issues will record the events that are to become Air Force history.

That first issue back in September, 23 years ago, the first page of which is reproduced below, began with this call for airmen:

"Irrespective of status in the draft, the Air Service (predecessor to the Air Forces—Ed.) has been reopened for induction of mechanics and of candidates for commissions as pilots, bombers, observers and balloonists, after having been closed except for a few isolated classes for the past six months."

The issue dated October, 1918, carries the story of the high flight made by Captain Rudolph W. Schroeder, who climbed to a record-breaking 28,900 feet over Dayton, Ohio. In the News Letter he wrote of his sensations before and after he resorted to his oxygen supply. Many important flights are recorded in later issues.

In 1921, a column in the News Letter was inaugurated under the title: "And I Learned To Fly From That." It was conducted on the principle of the old-fashioned Methodist experience meetings in which individuals bared their souls for their own benefit and for the benefit of others.

Following the first

emergency parachute jump by Lieutenant Harold R. Harris in 1922, the News Letter regularly devoted considerable space to report the experiences of pilots who were forced to bail out. The News Letter became a sponsor of the now famous Caterpillar Club; whenever someone qualified for membership in this mythical organization by completing a forced jump, the News Letter kept a record of the event and published the new member's experiences for the edification of prospective members.

During 1922, 34 issues of the News Letter were published, but in succeeding years, due to the reduction in personnel, the annual output gradually dwindled until it was possible to publish only 21 issues in 1925, and from 15 to 17 issues in the years up to 1938. Ten issues were published in 1938, when, in October of that year, the News Letter was discontinued. It was resumed in 1935 as a semi-monthly and 24 issues were published annually thereafter until July, 1941.

Father of the Air Forces official service journal was the late Lieutenant Colonel Horace M. Hickam, in whose memory Hickam Field, Hawaii, was named. Colonel Hickam was in charge of the old Information Division of the Air Forces, which fostered the News Letter for many years, until 1922, when the Division and the News Letter passed over into the hands of Colonel (then Major) Ira A. Rader, one of the Army's pioneer airmen.

The names of officers who have had direct supervision over the News Letter include Lieutenant General H. H. Arnold, our Commanding General; Major General H. R. Harmon, Brigadier General LeG. Walsh, Colonel Henry W. Harms, Captain Burdette S. Wright, Lieutenant Colonel Ira Longanecker, Major General Walter R. Weaver, Colonel John D. Reardan, Colonel Harrison

H. C. Richards, Brigadier General Robert C. Candee, and Colonel Arthur I. Ennis.

Other officers who have been closely associated with the News Letter include Major General Ira C. Eaker, chief of the U. S. Bomber Command in the European theater; Brigadier General Lester T. Miller, Colonels William H. Crom, David S. Seaton, Roland Birnn, Thomas M. Lowe and Ross G. Hoyt, and Captain Corley P. McDarment (Ret.).

DECEMBER

Brief

THE COVER scene for this issue was selected as typifying what might be called the most dominating action of the Army Air Forces during the first year of war—high-level bombing with aerial gunners aboard our heavy bombers shooting down enemy interceptors. The cover is a reproduction of a painting by Walter Herrington, a New York artist who received his art training in Chicago and applied his brush in Texas before coming East.

MAJOR FALK HARMEL, whose history of the Air Forces News Letter appears in the adjoining columns, modestly omitted his own name from the list of men responsible for the development of the publication. Actually, Major Harmel has been more closely associated with the News Letter than anyone else during his 20 years and more at Headquarters. He now is attached to the Historical Section of Air Intelligence.

OLD BAG OF BOLTS came off the same production line as other B-24s but it becomes a definite personality in the article, Page 6, by Major Ben H. Pearse, a former Washington newspaperman on duty with the Air Transport Command. Major Pearse recently was assigned to the Command's Alaskan Wing.

AVIATION CADET ROBERT GIBSON, whose combat experiences as a radioman in the Southwest Pacific appear on Page 35, received his original radio schooling at Chanute Field, Illinois, in 1939. He now is training at Scott Field, Illinois, to become a Communications Officer. Cadet Gibson's story and the "Bag of Bolts" article were found to coincide at one point: the "other" plane referred to in the paragraph on Page 7 which describes how "Bag of Bolts" amazed the Dutch at Bandoeng, Java, is the same B-24 Gibson was in when Dutch anti-aircraft fire forced his pilot to return to Singapore (Page 35).

THE soldier at Scott Field who reported the loss of 16 teeth (his false uppers) following a hitch-hiked ride en route to camp, should find a double meaning in the security message on the back cover: "When You Open the Door . . . Shut Your Mouth."

WHEN four Colonels, three Majors and two Captains were given a preview of the AIR FORCE quiz which makes its first appearance in this issue (inside back cover), the top score was 90, the lowest 55 and the average 75.

AIR FORCE, December, 1942

THE FIRST NEWS LETTER

Sept. 21, 1918

From the ANNOUNCEMENT (PROPOSED) BY MAJOR
 FALK HARMEL, AIR FORCE, HEADQUARTERS, ARMY AIR FORCES

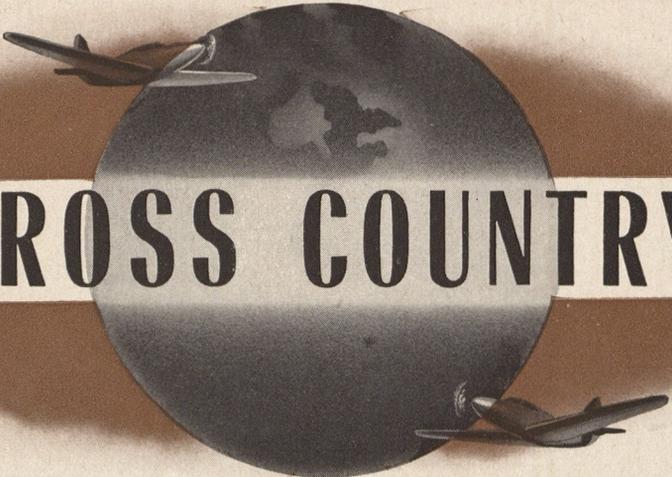
The War Department authorizes the following:

Proposition of airmen in the draft, the Air Service has been reopened for induction of mechanics and of candidates for commissions as pilots, bombers, observers and balloonists, after having been closed except for a few isolated classes for the past six months.

The War Department proposes that all such candidates, whether mechanics, observers and balloonists, or pilots, should be given the opportunity of being trained in the various ground schools through graduation. However, a large number of such candidates in the case of the Air Service have been previously inducted into the service, and the War Department proposes that such candidates be given the opportunity of being trained in the various ground schools through graduation. However, a large number of such candidates in the case of the Air Service have been previously inducted into the service, and the War Department proposes that such candidates be given the opportunity of being trained in the various ground schools through graduation.

While this present call for flying candidates is being made generally to the War Department, it is proposed that the War Department should also be given the opportunity of being trained in the various ground schools through graduation. However, a large number of such candidates in the case of the Air Service have been previously inducted into the service, and the War Department proposes that such candidates be given the opportunity of being trained in the various ground schools through graduation.

Atlanta, Ga. George School of Washington, D. C.
 Chicago, Ill. 200 East 11th St.
 Dallas, Tex. 1000 Main St.
 Fort Worth, Tex. Park Field, Fort Worth, Tex.
 Kansas City, Mo. 1000 Main St.
 New York City, N. Y. 1000 Main St.
 St. Louis, Mo. 1000 Main St.
 San Francisco, Calif. 1000 Main St.
 Seattle, Wash. 1000 Main St.
 Tampa, Fla. 1000 Main St.
 Washington, D. C. 1000 Main St.



CROSS COUNTRY

THIS spot up front will be used to piece together odds and ends of the month, whether they be of the combat and training variety or of a more general nature.

For this issue it seems fitting that a few words be devoted to how the Air Forces News Letter became AIR FORCE and what AIR FORCE is all about.

In recent months the demand for News Letters far exceeded the supply. To meet this demand it became necessary to change our method of reproduction; redesigning of the journal fell right in line with the change. Hence this new format. The words "News Letter" were dropped from the title because they were outdated. That's the background.

AIR FORCE is published by the Army Air Forces for officers and men of the Army Air Forces. It will be made available to all Air Forces personnel within the continental limits of the United States—and by "all" we mean officers, enlisted men, cadets and students.

Sufficient copies will be furnished each Air Forces activity for all to read. However, bulk station shipments, not individual mailings, are our *only* method of distribution to the field. If you fail to see a copy check with responsible authority at your own field or installation.

At the outset, it isn't possible to distribute as many copies as we would like to overseas units without burdening our transport facilities. As much as we want everyone in the Air Forces to receive the service journal, it is far more important that you who are overseas get the maximum of guns and ammunition and plane parts and letters from home.

AIR FORCE is your medium for exchanging ideas and information pertinent to the operations of the Army Air Forces and pertinent to your own military interests. It is your medium for linking Headquarters with the field, one field unit with another, individual with individual.

We believe AIR FORCE should be fundamentally helpful, not merely informative and entertaining. But we think all three can be achieved by presenting material that is accurate, readable and adequately illustrated.

In our opinion, a good aviation story, factually sound, can always stand on its own feet; and we will try to give you good aviation stories. If, in addition, that story contains information that will be helpful to you as a member of the Air Forces, in some way help you fight the war—then we have accomplished something worthwhile. In AIR FORCE that is the objective we will keep shooting at.

We depend on you for the bulk of the material that appears in AIR FORCE, and for suggestions and criticisms. Your contributions do not have to be written in some "inimitable style"; write the article just as it comes easiest to you, or merely give us facts and points to be put across and let us do the rest. Remember that we prefer to run articles that appear under the by-lines of the authors and that we give credit to privates in the same size type we use for generals.

And now for some odds and ends.

DURING the raid on Dutch Harbor last June, Jap fighters stumbled onto an advanced Army airfield out in the Aleutians. Our land based aircraft, up on patrol at the time, immediately tore into the enemy.

Meanwhile, according to one of the sources for our Alaskan article in this issue, a big C-47 transport landed at the base with a load of cargo, the pilot not realizing what kind of a show was going on up above. As he cut the motors, the pilot turned to the co-pilot and pointed to the small winged objects hurtling across the sky.

"The boys sure do play hard, don't they?" he commented.

"Yeh," the co-pilot grinned, "if they don't look out somebody's going to get hurt practicing that way."

A moment later they froze in their seats. One of the "boys" had started down, quite obviously hurt. Their jaws dropped in unison when it got low enough for them to make out the rising sun insignia on the fuselage, and the familiar white star on the ship hot in pursuit.

"Well I'll be damned!" was all either of the C-47 men could find to say.

HHEADQUARTERS is encouraging and intends making the fullest use of original thinking among Air Force personnel on tactical, technical and administrative subjects. C.O.s have been directed to encourage their personnel to develop and submit constructive plans, ideas and criticisms along these lines. They are to be submitted through command channels to the Assistant Chief of the Air Staff, Management Control, who will forward them for consideration to the proper Headquarters agency. The procedure does not apply to unpatented inventions, which are to be submitted as provided in AR 850-50, Dec. 31, 1943, as amended by Sect. 1, Circ. 248, WD, 1942.

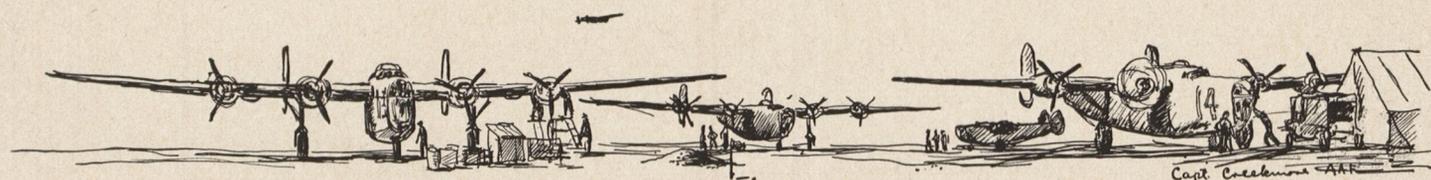
(AIR FORCE will pay particular attention to original ideas from the field which improve the over-all effectiveness of the Air Forces; we intend, whenever possible, to publicize these ideas after proper clearance has been obtained at Headquarters.)

THIS technique was reportedly used by a German squadron in a recent attack on a convoy off the northern coast of Norway: Sixteen aircraft approached the convoy head-on at low altitude and in column until a point was reached two miles from the head of the convoy. From this point each attacking plane attempted to filter through the convoy columns singly at very low altitude. One captain in the convoy said each aircraft carried two torpedoes which were released singly from as low as 10 feet, and that the planes, after launching their torpedoes at the outer column of ships, proceeded through to the inner columns so low that his fore-castle machine guns were firing downward at the attacking planes.

LUKE FIELD'S location in the Arizona desert makes it difficult to keep up with the daily newspapers, but the men at Luke miss little of the important news of the day. Twice daily a Public Relations Office representative jumps on a motorcycle, dashes around to field detachments and delivers news flashes taken from radio reports.

EXAMPLES of ingenuity are springing up throughout the Air Forces. We want to hear about more of them. At any rate, belated congratulations:

To Private Arthur W. Rodrick, Air Trans-



port Command radio operator, for rigging up a makeshift radio homing device by stringing wire from his grounded plane to a motor vehicle and thus guiding two storm-lost B-25s, unable to make radio contact, to a safe landing in a mountainous area in China during the monsoon season.

To the boys on a Pacific island who salvaged lumber from a wrecked ship, washed up on the beach years ago, to make an airplane hoist capable of raising a fighter plane almost as easy as if it were in a model hangar.

To First Lieutenant Lew Jordan, who needed an antenna base insulator in Aruba, couldn't wait for the regular supply ship, and used a soda pop bottle which worked to perfection.

To Harry T. McCormick, machine shop superintendent at the Minter Field sub-depot, who has designed 25 separate jigs to speed up production and repair of aircraft.



JUST another reminder to check your rights and benefits if you carry accident or health insurance policies! Practically all accident and health policies contain provisions which exclude any coverage where the injured person is engaged in military service in time of war. You may be paying premiums on such policies (which you held prior to entering the service) and are receiving restricted or no coverage for these premium payments. Your insurance agent should be glad to give you all the information on your policies. If you haven't already done so, check with him for your own protection.

INFORMAL reports from Russia state that Soviet airmen have repeatedly used inland lakes as landing areas to make contact with their troops behind enemy lines. In summer months flying boats, not only light amphibians but heavier planes, have been used on these missions. With winter at hand, the Russians expect to continue this aerial supply line by using aircraft equipped with ski runners to enable them to land on frozen lakes.

WHEN flying in the Greenland area it will pay to have these points in mind:

In investigating strange fjords it is better to start from the ice cap side and fly seaward; in some fjords you can't turn around at the inboard end.

An ice cap is smooth near the crown and extremely rugged near the mountains. If forced down on an ice cap, stay with your plane to enable searchers to locate you more easily.

Radio ranges which run over the ice cap contain many multiples below 10,000 feet.

Skis and ski poles for each member of the crew should be carried on missions in this area. A Primus stove also should be taken along in the plane.

A .22 caliber pistol or rifle is much better to have along than a .45 in case you are forced down. Rabbits and ptarmigan (Arctic grouse) are the only game available in southwest Greenland.

Remember to carry the most protective dark glasses you can get. And don't forget the heavy, long underwear.

WHEN the Japanese were evacuated from the Seattle area a Jap printer walked out leaving a printing press in the basement of a building.

Lieutenant Lawrence A. Rogers, Special Services officer at McChord Field, heard about it and began dickering on prices. He finally bought the press for \$1, with the proviso that he would move it out of the basement. The press, representing something like \$500 in equipment, was loaded on a truck and taken to McChord.

Now, much of "Rip Cord," the camp newspaper, is printed on the former Jap press, and the cost of the weekly publication has been greatly reduced.

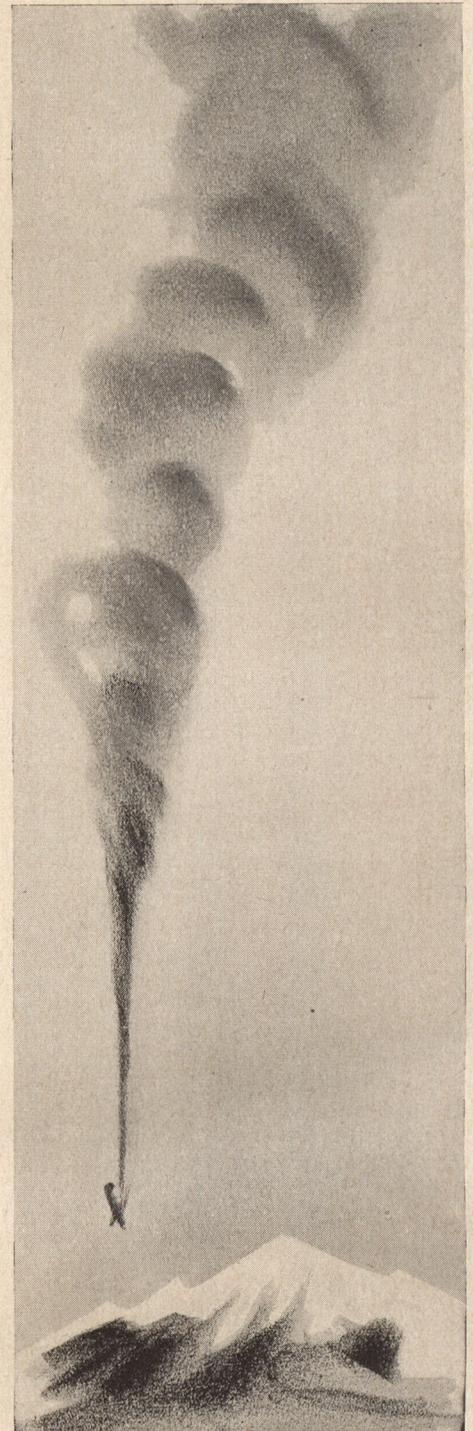
AN investigation of a recent crash showed that the pilot had deviated, contrary to specific instructions, from the authorized route of his mission. Since the death of this pilot was "not in line of duty and was a result of his own misconduct," all gratuities to which his beneficiaries were entitled under provisions of A.R. 35-1560 were withheld.

THE Russians report unofficially that German bombers under attack have been known to release small time bombs attached to miniature parachutes. These 'chutes, when swept up by air current behind the bomber's tail, endanger fighters which are pursuing the bomber.

MORE R.A.F. SLANG . . . "A black," something badly done; "bombphleteers," airmen engaged on the early pamphlet raids; "to be browned off," fed up; "in the drink," to come down in the sea; "fan," propeller; "get cracking," get going; "office or pulpit," cockpit of aircraft; "play pussy," hide in clouds; "quick squirt or quickie," short, sharp burst of machine gun fire; "sausage machine," pom-pom gun; "shot down in flames," severe reprimand; "stationmaster," C.O. of station; "tee up," to get ready; "touch bottom," to crash.

THE item in the Control Tower section of the August-September Air Forces News Letter concerning the Army of Occupation of Germany Medal should have pointed out that this award is authorized not for *all* veterans of the World War I, but for Officers, Army Nurses, Warrant Officers and Enlisted Men of the armed services who served in Germany or Austria-Hungary during the period from November 12, 1918 to July 11, 1923, inclusive.

Applications will not be submitted until the Medals become available. (Because of the metal used, they will not be struck until after the present conflict.) Until then, those who are entitled to it, may purchase and wear the authorized ribbon. For complete details, see W. D. Circular No. 176, June 6, 1942.—THE EDITOR.



ALASKAN OFFENSIVE

THE husky Air Force Sergeant counted out 12 lumps of coal from the gunny sack beside the G.I. stove and dropped the lumps strategically one by one on the little bed of coals. Then he peered through the flap of the tent, spat disgustedly at the whirling snow and stretched out again on the cot. The Sergeant seemed very much at home in this Aleutians outpost.

"It's as plain as the prop on a peashooter," he said. "I've got it all figured out. I say the Japs had big ideas when they tried to drop in on Dutch Harbor last June. Midway was a big idea, too, but I figure the Japs to attack Siberia before they try to invade the States. Even before Stalingrad their mind was on Siberia first of all.

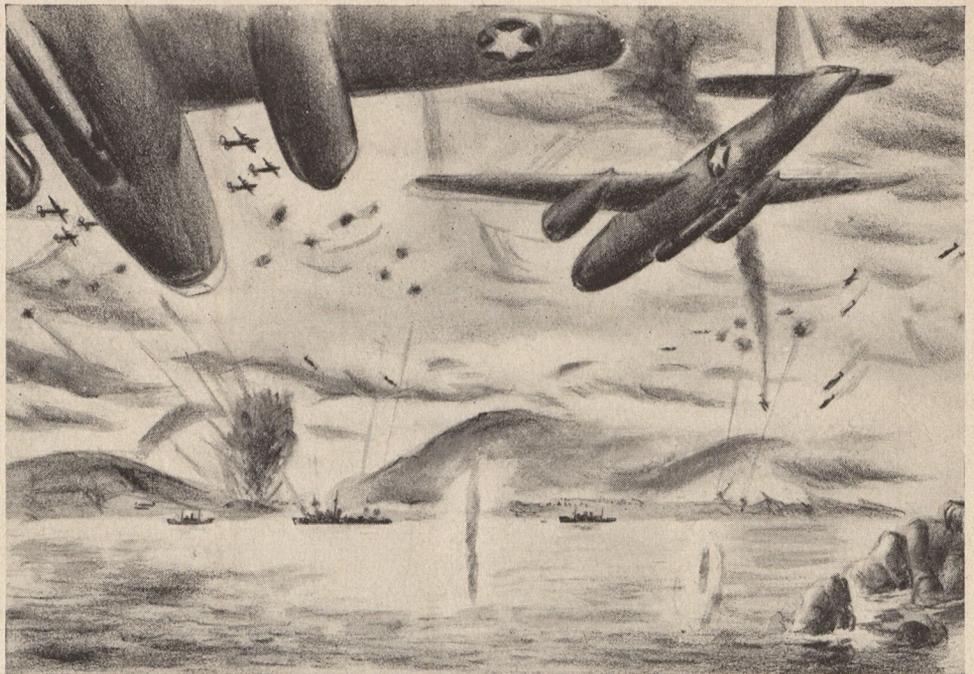
"But before they try to take on the Russians they've got to protect their right flank. They've got to cut off the road for reinforcements from the States. The only way to do that is to cut off Western Alaska.

"Now, except for airplanes bringing in high priority stuff, the only way to supply Western Alaska is by boat, and the Japs have been fishing around here long enough to know that the shortest and best way to Bethel, to Nome and to all the other places on the western coast is by Unimak Pass, between Unimak and Unalaska Islands. So they figured by taking Dutch Harbor, on Unalaska, they could close the pass and bottle up all Western Alaska."

The Sergeant fished a cigarette out of his pocket and lit it. Hearing no comment from the other cots, he looked around to be sure his companions had not gone to sleep.

"Damned if I don't believe they could have done it, too, if they had knocked off Dutch Harbor," he went on. "There would have been a wedge a thousand miles wide between us and the Russians in this neck of the globe. And that wouldn't have helped any, believe me. The Japs could have gone ahead with any plans they had in Siberia.

"Only they didn't get Dutch Harbor. The Japs are smart and know a lot, but they didn't expect to run into any land-based planes as far out in the islands as they did last summer. There are lots of unsung heroes in this man's war, but for my money I'll take the guys in the B-26 that dropped the tin fish on the Jap carrier that day. When



Fighting weather and Japs with our Air Force in the fog bound Aleutian Islands.

the Martin dropped that torpedo on the carrier deck, it was the last straw.

"A friend of mine was at the radio listening in at the time and heard the Jap pilots calling their flat top. 'Whereabouts, please, gas verree low, onry 10 minutes gas,' them Japs were saying over the radio. 'Whereabouts, please, onry five minutes gas.' Then it was 'onry' three minutes gas and my friend could almost hear them Japs plumping into the water one by one as they looked around for the landing deck they had taken off from to give the works to Dutch Harbor. Plop! Plop! Plop! Fifteen, twenty, maybe thirty of 'em. Maybe more; who knows?"

"The pilot of that B-26 came back for another torpedo, cussing like hell because he didn't get the carrier the first time. Then he went back out there. The pilot was never heard of after that, but neither was the Jap carrier. I think he got the carrier like he said he would. Even if he didn't, I'm betting he scared it so far away it hasn't been around these parts since.

"Of course, it's no cinch to get the Japs out of Kiska. But they're on the defense at Kiska, while we'd be the ones on the defense if they were in Dutch Harbor."

The Sergeant rose to peer out through the tent flap again. A curtain of fog obscured the anti-aircraft emplacement on a knoll less than 50 yards away. He spat his disgust once more and went back to his cot.

This article was compiled from material submitted in informal reports by Colonel H. W. Shelmire, Headquarters, Army Air Forces; Major Ben H. Pearse, Air Transport Command, and Lieutenant George Bradshaw of this staff. Illustrated by Captain Raymond Creekmore.—THE EDITOR.

FIREWORKS opened up the third day of June along the sub-Arctic string of volcanic rocks that form the Aleutian Island chain.

The drone of Jap planes through the early morning mist silenced radios from Puget Sound to San Diego, even sounded an alert at the Panama Canal, but there was plenty of noise on the northeast corner of Unalaska Island.

The Japs came from different directions, five flights of three planes each. They swept down over Dutch Harbor and Fort Mears, strafing the streets at 500 feet, attacking anti-aircraft batteries which opened up with a volcano of fire. Anti-aircraft guns on the destroyers, a mine sweeper, a Coast Guard cutter and an Army transport joined in as they got under way in the harbor. A Jap plane drew a black smudge across the sky and disappeared behind Priestly Rock. A PBY taking off from the bay was shot out of control by a Zero and crashed on the beach. A Jap fighter hit by ack-ack burst into flames and dove screaming into the harbor.

Five minutes later four Jap bombers appeared flying high and dropped high explosive and incendiary bombs. One raised an oil tank more than 100 feet in the air and another started a fire near a warehouse. A gunner on one of the ships in the harbor brought down a bomber which trailed black smoke until it disappeared behind the hills. It was all over in 20 minutes.

Jap reconnaissance planes returned at noon but if their cameras were any good they showed all the fires were out and the same number of surface ships in action as before the attack. The enemy came back the next afternoon with 18 carrier-based bombers escorted by 16 fighters, but it was his final appearance in the vicinity of Dutch Harbor.

Only a poet could do justice to the story of the aerial slugging match that has been going on ever since.

(Continued on Page 27)



Old Bag of Bolts

By Major Ben H. Pearse

AIR TRANSPORT COMMAND

SHE was blessed with an assortment of names. To many she was "Old '76." Some called her "Red Cap" and others "The Gravy Train" because she carried so many important personages to the four corners of the earth. But the name "Old Bag of Bolts" seemed to fit her best.

Officially she was just A.C. Serial Number 40-2376, a B-24 airplane with a history all her own, as can be vouched for by the scores of men, women and children whose lives she saved—ferry pilots in the North Atlantic, combat crews and refugees in the South Pacific.

It is anybody's guess what the enemy might have called her. Old Bolts seemed to have a charmed life while she was trucking precious cargo all over the Pacific combat zone in a dangerous game of hide and seek with Jap aircraft during those first hectic days of war.

Squat and lumbering on the ground, she would waddle up to the head of a runway like a duck out of water. But once her ponderous landing gear was tucked away, she was a creature transformed—maneuvering her big hulk with the lightness of a toe dancer.

When Bolts was turned over to the Ferrying (now Air Transport) Command one day last year, months before Pearl Harbor, she had already cut her eye teeth on dozens of missions. She had reached middle age for a plane of her type, but it was just another case of life beginning at 40.

As a Ferrying Command ship, Bolts had no regular run. Home was any place she plumped her wheels down. And it was here, there and everywhere on short notice. Her crews had uncalled-for laundry all over the globe. Their baggage included

fleece-lined clothing and boots for the Arctic, shorts and mosquito boots for the tropics.

Bolts knew what it means to labor along through the heavy fog and mist of the North Atlantic burdened down with tons of ice. On the South Atlantic run her paint blistered under the equatorial sun; her motors choked through dust storms and wallowed through thunder squalls where St. Elmo's fire played about the leading edges of her wings and zigzagged eerily across the windshield.

Her crews ate quinine instead of candy as she shuttled back and forth from Washington to Cairo over steaming African jungles and shimmering desert sands. Now and then they would zoom her low and let her chase herds of giraffes to break the monotony. With little more than a wrench and screwdriver to work with, mechanics would jump out almost as her wheels touched the ground, then sweat in the torrid shade of her wings to change a cracked exhaust brace or broken stack, replace an oil valve, change spark plugs, service the oleos and clean the strainers.

So thoroughly did the factory workers who put old Bolts together do their job and so thoroughly did her own mechanics sweat that her pilots were able to report at the end of each leg of each flight, under the heading of "Mechanical Difficulties," the sweet monosyllable "None."

Not that Bolts didn't have her moments. Back before her South Atlantic and South Pacific adventures, for instance, on that trans-Atlantic round trip to the United Kingdom. She held ferry pilots as passengers and the trip was routine until two hours out of Montreal on the return hop.

From landfall on the coast of Labrador there had been intermittent, moderate icing of the rime type. Then things began to happen. Without warning, the rime crystals changed to hard clear ice, formed from large, supercooled rain drops. Bolts was laboring. Second Lieutenant C. W. Dean, co-pilot, turned on the de-icer fluid for her props and the boots on the leading edges of her wings and tail, but the altimeter needle kept sinking. First Lieutenant James W. Anderson, pilot, pushed forward the throttles as the needle continued to turn slowly downward. At last, when the throttles were wide open, the needle stopped. Dean and Anderson breathed a sigh of relief.

THE coating of ice, visible with a flashlight out the side windows, wasn't getting any thinner. Anderson decided to turn around and try to get out. Bolts reacted sluggishly to the controls. It was like traveling down stream in a heavily loaded canoe, but she made it without losing any of her skimpy altitude. Then, for four hours, Bolts was lost.

Second Lieutenant A. H. Anders, navigator, kept looking for a break in the white mist that would give him a chance to get a fix. Staff Sergeant James A. McVicar, radio operator, listened in vain through the sputtering static for a signal that would give an inkling of their course. The Northern Lights had been acting up; sometimes they interfered with reception, sometimes they didn't. Now, of all times, they made his earphones sputter like a hamburger stand on circus day. He couldn't raise a soul.

The passengers in the bomb bay knew well what was going on. If that first long, gradual turn wasn't enough of a tip off, the crashing of hunks of ice thrown off the propellers against the fuselage behind them left no doubt in their minds. Then the utter blackness of their frigid cell was broken by a shaft of light and a cheerful voice from the pilot compartment forward: "Everybody put on your parachutes."

Staff Sergeant D. D. Greenwalt, engi-



neer, watched the dials on the panel before him for the flicker of a needle that would tell him that Bolts was giving up. The ice built up on the engine cowls until it reached the arc of the props and was knocked back inside, but the carburetor stayed out of the danger zone. The de-icing system worked to perfection. As the ice built up on the tail surfaces, Old Bolts would shake herself all over, but her de-icer would break it loose and all would be smooth for two or three minutes. Meanwhile, her four motors roared on in unison with never a conk or sputter.

Finally, 15 hours after a takeoff that seemed a year away, Lieutenant Anders spied a patch of dark sky and three beautiful stars. He fingered the thumbscrews of his octant, herded the errant bubble between the hairlines of the artificial horizon, and quickly figured on a scratch pad before him until he had a line to draw on his chart. He couldn't tell where he was along that line without a second fix that would give him another line to intersect the first: then X, the intersection, would mark the spot, their position. But the break in the clouds was gone now. He waited, eyes glued to that little glass hatch overhead.

The door to the bomb bay opened and Sergeant McVicar appeared, climbing over ferry pilots packed in like sardines. There had been a break in the radio fog, too, and he had a bearing. Would it help?

"Will it help? Hell yes, it will help."

With this protractor, Lieutenant Anders marked off 194 degrees true from — and drew a line that intersected his first line. He measured carefully—420 miles NNW of LR in Newfoundland—then leaned over and tapped Lieutenant Anderson on the shoulder.

"Sir, you are now over Labrador flying straight for the Atlantic Ocean. A course of 169 degrees should get you to LR in about two hours."

Lieutenant Anderson nodded without turning around and bore down heavily on the wheel. The ailerons, elevators and rudder on old Bolts were frozen again, as they had been intermittently for the past four

hours, but after some tugging at the controls Bolts slogged around like an obedient dray horse and turned her pug nose toward LR. Pulling back on the controls would not raise her nose an inch, but her four motors chugged on through the darkness until she settled herself gently on the mile-long runway at LR.

No sooner had Bolts rolled to a stop than goggle-eyed ground crews began arguing whether her coating of ice—two to three inches broken off by the de-icer boots—weighed one, two or three tons.

But Bolts had tougher flights than that before her. Her instructions, to be exact, came in a recorrected copy of Operations Order No. 163. That was December 5,

The Saga of a faithful old B-24 that asked no quarter while making history during the early days of the war

1941. She subsequently covered nearly 150,000 miles on the grind—it was really one continuous flight—and her engines hardly ever cooled until the very end. Time for her 25, 50 and 100-hour checks flew past unnoticed, all because of the scribbled note that fluttered in the radio operator's hand as he dashed out to Bolts at Trinidad.

"Pearl Harbor attacked by Japanese at 0728," the note read.

The name of Ambassador William C. Bullitt headed the list of passengers as old Bolts roared out over the Caribbean. But famous names were soon to become commonplace with Bolts. At Cairo, on that hop going over, a party of high-ranking officers boarded her for an emergency mission to Australia. Then she was loaded down until her sides were about to pop with ammunition and scores of other items badly needed in a hundred spots in the East Indies.

Maps were scarce, good ones, anyway. First Lieutenant Ben Funk, the pilot, picked

up some information from a Dutch pilot at Karachi, but he still wasn't prepared for that short runway at Calcutta. It was marked "1,000 yards" on his map—barely enough for a B-24 loaded until her tires bulged—but actually it was only 760 yards. Somehow, with plenty of brakes, Lieutenant Funk and old Bolts managed it—with 100 feet to spare. To get off that runway, Bolts had to leave some gas behind.

On to Rangoon, which the Japs were bombing daily, then to Bandoeng in Java, where the Dutch made quite a fuss over Bolts. They had never seen anything like her 28-ton body close up before. In fact, she was such an unfamiliar sight that an Allied plane looking very much like her had been fired on by Dutch anti-aircraft less than a half hour before. But Bolts came in without difficulty. (The other ship went on to Singapore.)

At Soerabaya, the next day, Major General Lewis H. Brereton and Major General George H. Brett were taken aboard old Bolts for a 10,000-mile inspection trip, 3,600 miles of it in a one-day flight from the west coast of Australia to Sumatra.

There was great need in the Indies for maintenance personnel to service the B-17s that had come in. Bolts was ordered to go from Australia up into the Philippines and bring out as many key maintenance personnel as possible. That was late January. The ground crews in the Philippines had been removed from Luzon to a secret airport on Mindanao. Japanese-controlled Davao was only 100 miles away. It was a ticklish job, flying in at night, picking up the crews, and getting out unseen. Bolts had no armor, no self-sealing tanks, and only a few machine guns for protection.

STAFF Sergeants Leo Zulkowski and Frank Sayko worked all day on Bolts, checking and rechecking for the afternoon takeoff. The motors had long since passed the 400-hour mark. From Australia to Mindanao and back was 3,600 miles, almost all of it over open water. Things had to be right.

Old Bolts made the trip without incident, although Lieutenant Boselli had to change course five times to avoid Jap-controlled areas. During the last lap of the flight, Captain Hewitt T. Wheless, who had flown every mile of the coast in his B-17, stood between Lieutenant Funk and First Lieutenant Charles Bowman, co-pilot, to guide them to the secret airfield. Bolts brought out 25 crack mechanics in her bomb bay.

About a week later Bolts was off for Rangoon with General Sir Archibald Wavell aboard. The Japs had raided a field nine miles from Rangoon a half hour before her

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"... she sat down in the water a few hundred feet off shore. After more than 600 hours, her motors had sputtered for the first—and last—time."



SQUARE PEGS IN SQUARE HOLES

By *Lieut. Allen C. Rankin, Jr.*

SOUTHEAST AIR FORCES TRAINING CENTER

Here's how psychologists use scientific heckling to select the bombardiers, navigators and pilots of the Army Air Forces

YOU ARE SITTING in a room with a half dozen other cadets, each of you facing a small steel plate with a tiny hole in the center. In your hand is a stylus. You must place the point of the stylus in the hole, remembering that each time the stylus touches the edges of the opening an electric charge scores one point against you.

The examiner speaks in a quiet voice:

"Are you ready now? Insert the stylus."

Electricity spits through the room. You are certain you touched the edges a dozen times. You wonder how the other fellows are doing. The examiner is about to speak. This time he shouts.

"All right. Try it again!"

More electricity.

"You!" the examiner yells—and you are certain he means *you*. "How do you think you will ever be a flier if you can't do a simple thing like this without getting nervous? You'll never make a flier. You couldn't be a buck private!"

His words bite a little and the stylus shakes even more. The examiner pulls a lever. A horn honks. Another lever. A buzzer rasps. Above this added confusion, the examiner screams:

"Look at you! How steady do you think you'd be under machine gun fire? What would you do in real combat? Live bullets!"

Then he hits the racket "jackpot." A hunk of metal which he has released from the ceiling comes thundering down on a loose piece of sheet iron. It sounds as if all hell has broken loose. You almost lift the steel plate with the stylus.

"What are you jumping for?" bawls the examiner. "Does a little thing like that make you nervous? Now, remember this number: two, four (honk, honk . . . toot, toot . . . crash!), five, nine, eight (buzz, buzz . . . honk!) seven, four (CRASH! . . . toot, toot, honk) eight!"

The room becomes suddenly quiet and the examiner purrs: "Now write down that number, please."

You ponder for a moment. What number? But you put something down on paper and the test is over.

This whole procedure appears to be more than a trifle on the crazy side. Actually, it is a sample of the mental obstacle course which noted psychologists have devised to help provide a short cut in earmarking aviation cadets at Army Air Force Classification Centers. Not all of the course is as wacky as this noisy test designed to judge nervous stability, but part of it is.

Scientific heckling, an outgrowth of long and arduous experimentation, has become an important feature of the classification process now used daily in the centers at Nashville, Tennessee; Kelly Field, Texas, and Santa Ana, California. Cadets are exposed to devices ranging from "nightmare" games of Chinese checkers to revolving pirate's gang-planks; from wingless, tailless airplanes to ingenious noisemakers set off at just the proper moment to have a maximum nerve-shattering effect. And the entire procedure is designed to help predict:

1. For research purposes—whether a cadet is likely to succeed or fail as an Army flying officer.

2. For practical purposes—whether a cadet should be trained as a pilot, bombardier or navigator.

The old question was: "Can you pre-determine whether a man can fly?" The new question: "Can you pre-determine which one of three intricate jobs this cadet should have?"

In two days the psychologists accomplish what formerly required months to learn about applicants for flying jobs.

The ideal test of whether a cadet should sit at the controls, plot a course with a compass or drop bombs on a target would be to put him through the entire courses for each job and select his best effort. But in addition to a cost of more than \$100,000 per man, such a procedure might outlast the war with the first class of students.



In steadiness test, Cadet Lionel Humphries holds a pin-sized stylus in a nail-sized hole as the instructor attempts to rattle him. If the stylus touches the hole, it records a demerit.

Science does the job with tests and gadgets based on simple logic. As one expert in the field expressed it: "If a man can flip a button into a water glass with a paper clip, it is a fair indication that he can also play a nice game of tiddle-de-winks."

The tests devised by the psychologists have "face validity"—actually resemble parts of the job to be done—no matter how much the average cadet thinks otherwise as he struggles through the classification procedure. Tests now in use were first tried on almost 1,000 cadets, and each test proved itself. The cadets were scored on a given test and then watched closely as they went through their training. If an overwhelming number who had done well on the test did proportionately well in assigned courses, and, similarly, if the number who failed the test, did poorly in the courses, the test was pronounced sound for this phase of classification.

IN ADDITION to the stylus-in-the-hole test for nervous stability, here are some typical hurdles a cadet must take as he goes through the classification center:

On the first day, the cadet is given a written examination, meted out parcel by parcel. He finds himself in the same room with about 100 others, each sweating over papers in individual stalls designed for the purpose. The written tests range in subject matter from mathematics, to vocabulary, to map reading. The papers invariably are turned in with misgivings.

Jittery, the cadet shows up the next day and pushes into a small room with six or eight others. He sits at a long table and is baffled by two boards confronting him, side by side. In one board is inserted a maze of small wooden pegs; in the other are holes.

"When I give the word," explains the



Lights flick on this complicated testing board in different combinations in the reaction time test, and Cadet Milan Law is trying to bring the red and green lights into straight lines by coordinating the movements of his hands and feet on the dummy joystick and rudder bar.



Another reaction time test requires students to manipulate four buttons according to a combination of flashing red and green lights, so as to extinguish a white signal light at top of the panel. A clock records total seconds needed to put out the white light 50 times.

examiner, "you will transfer the pegs in one board to the holes in the other in the shortest possible time. Stop immediately when I say stop. The number of pegs you have removed from the board will determine your score."

This simple but effective test measures hand and arm dexterity. As in all similar tests, a few trial runs are made so that examiners may be sure the cadets understand just what is to be done.

There is another peg board test. In this one the pegs are square, with round tops, half yellow, half black. The objective is to pick up the peg, turn it completely around and replace it in the same hole. The cadet is told to turn as many pegs around as he can in a specified time. This test measures the finger dexterity needed in performing many flying duties.

The name of the next one places a cadet on guard. It is called the "Discrimination Reaction Time" test. A group of square boards stand perpendicular to the table. Five lights stare from each board. Four of the lights, when flashed on, will be either red or green; one, white. Four small levers, resembling the turn-on-turn-off switch of a radio, stick up from the table at the foot of the board. The cadet is told which switch to pull when certain combinations of red and green lights flash on. When he pulls the right switch the white light, which also shines on the board with every combination, will go out. The cadet is scored on the time it takes to put out the white light in 50 trials. An operator at the end of the table flashes on different light combinations to confuse him. A clock at the end of the table records the total time. (Average time for some 50 trials is about 49.3 seconds.)

The contraption in the next test is a "panic" for the average cadet. The machine, called the Serial Reaction Time Apparatus,

consists of a low seat for the subject, an airplane rudder and a joy-stick. A pattern of red and green lights pops out on a board. By coordinating the movement of the stick in his hand with the movement of his feet on the rudder bar, the cadet brings the lights together in the quickest possible time. Not until all the lights line up will they click off, then a new pattern of lights appears. The idea is to make the lights click off as often as possible in a given length of time.

AFTER the cadet has done what he considers his worst—which probably isn't too bad in reality—he is his own greatest problem. A self-cultivated crop of jitters makes him a fit subject for the heckling test which features the stylus-in-the-hole nightmare.

The psychologists are not dogmatic. They are the last to argue that their decisions be considered final in all cases. A cadet who feels he did not get a square deal in being classified is entitled to an interview with the commanding officer. If, in this interview, sufficient reasons are brought out as to why the decision should be reversed, it may be done at the officer's discretion.

Psychologists are quick to admit that their prediction average will come closer and closer to the bulls-eye of perfection in direct ratio to the betterment of their equipment.

Psychological research is so far ahead of the equipment with which it has to work that many psychologists also must be inventors, draftsmen, carpenters, metal workers and machinists to make practical application of their own brain children.

This war jumped the gun on psychology as on everything else. A research program, following a comparatively leisurely pace, was underway at the old classification center at the Southeast Training Center Headquarters,

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Latest type of bi-manual coordination testing device is demonstrated above by Cadet William A. Denniston. The students below are taking the "turn peg" test, which measures the nimbleness and control of their fingers.



"We'll Go Back Some Day..."

By Captain Robert B. Hotz

AIR TRANSPORT COMMAND

UNDER sunny Mississippi skies the Royal Netherlands East Indies Air Force is training for a comeback against the Japanese. It is a long way from the Jackson Air Base to the Southwest Pacific, but to these intrepid Dutchmen who survived the battle of the Indies last winter, it's the first step toward home.

With new American equipment and hundreds of recruits who escaped from the Indies, the Dutch colonials are rebuilding their shattered squadrons. Officers and men of the former army and navy air forces are now merged into a single separate air force commanded by Lieutenant General L. H. Van Oyen. Under his leadership they are preparing to carry on their battle to regain the lost colonial empire of Holland.

Backbone of this new Dutch air force are veterans of the Indies campaign who now serve as instructors in the Jackson training program. They will lead the new squadrons back into the battle of the Pacific.

Typical of these veterans and the battle they waged are three young flight lieutenants who fought the Japs last winter with inadequate equipment against desperate odds. Lieutenant Fritz Den Ouden engaged Zero and Messerschmitt fighters of the Japanese navy in an antiquated Martin B-10 bomber. Lieutenant Henry Simon, a fighter pilot, took on Zeros and Nakajima bombers in a Brewster Buffalo. Lieutenant Herman Arens met similar opponents in the same Lockheed Lodestar commercial plane he had flown for the Royal Dutch Air Lines in peacetime. The Martin B-10 was once the very latest in bombardment aircraft, but that was back in 1934 when Lieutenant General H. H. Arnold won the Mackay Trophy for leading a squadron of them on a survey flight from Bolling Field to Alaska and return. Seven years later, for leading a flight of B-10's against the Japs, Lieutenant Den Ouden won the King William's Order, highest Dutch military honor, and the Dutch Distinguished Flying Cross, personally awarded him by Queen Wilhelmina.

The B-10's flown by Lieutenant Den Ouden's squadron were souped up to do 210 miles per hour. They carried a .30 caliber machine gun fore and aft and two 1,100-pound bombs, but were without armor plate and leak-proof gas tanks. With this old equipment Lieutenant Den Ouden's squadron sank 13 Japanese vessels, including two heavy cruisers. Arrayed against these Dutch bombers were 300-mile-an-hour Zeros and ME-109's armed with two 20 mm. cannon and four machine guns.

"Against the armament of enemy fighters

Airmen of the Dutch East Indies, with one campaign behind them, rebuild an air force in the U. S. for a comeback at the Japs.

even a formation of B-10's had little chance," Lieutenant Den Ouden said recently, recalling his encounters over the Indies. "When we were attacked our flight scattered and ran for it. We tried to get down just above the water and zig-zag to throw off the Jap fire. When we were that low it was hard for Zeros and ME-109's to dive on us without crashing. If they caught us higher they usually made a rear attack. We tried to wait until the instant before they came within range. If you pulled the B-10 into a sharp stall at exactly that moment the Zero would go sailing by overhead and you could get a shot at him from underneath with your nose gun. We got several Zeros that way."

LIEUTENANT DEN OUDEN's squadron was mobilized at Bandoeng, Java, on December 2, 1941, after Dutch naval patrol planes had reported large concentrations of Japanese naval vessels in the South China Sea. Six days later these fleets attacked the Philippines and Malaya. By December 4, Lieutenant Den Ouden's squadron was established in a secret air base in Borneo ready for business.

Lieutenant Den Ouden went into action on Christmas Day over Kuching, capital of Sarawak, where Japanese troops were landing. His flight straddled a big ammunition ship with three 1,100-pound bombs from 12,000 feet.

"The sea seemed to explode under our bombs," Lieutenant Den Ouden recalled. "Many barges clustered around the big ship vanished in the explosion. Our plane was rocked by the blast. We knew it must have been an ammunition ship we hit. After the smoke cleared away there was only wreckage on the water. When we got back to our base my bombardier discovered a Japanese sailor's cap jammed in the bomb bay doors. It must have been blown up into our plane just as the bomb bay doors closed.

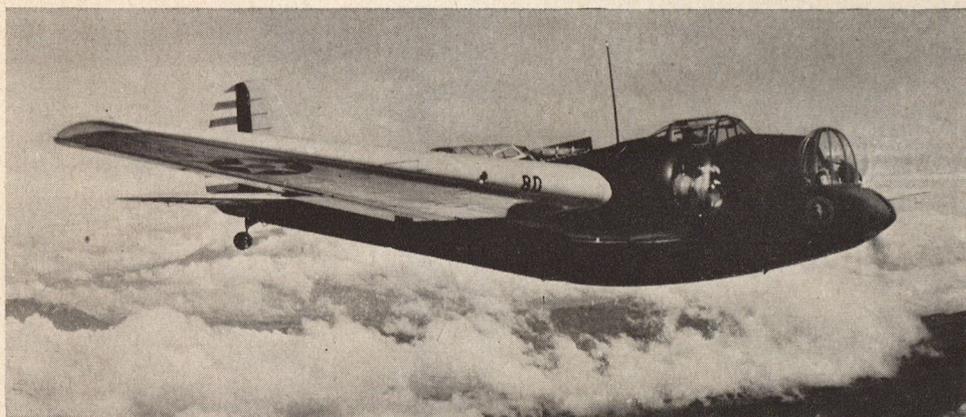
"Three days later over Miri in Sarawak we sank a large transport with two 1,100 pounders. I was watching the ship burn and roll over when the rear gunner shouted 'enemy fighters taking off from Miri.' There was no regular airfield there, but we learned later that Japanese fifth columnists had prepared a secret base on a large coconut plantation owned by Japanese nationals.

"Five Zeros hit us. My left wing man went down in flames. I saw two men bail out as the bomber plunged out of control. Then I heard the rattle of bullets against the metal skin of my plane and the staccato of my own guns in action. My rear gunner shouted, 'I got one,' but immediately I heard louder explosions and smelled the odor of bursting 20 mm. shell from the Zero's cannon. I finally got into the clouds and lost the Zeros."

Lieutenant Den Ouden's wife, Tillie, was a Dutch Red Cross Nurse at the base where his squadron was stationed. On December 28, after waiting hours for Lieutenant Den Ouden's flight to return, she finally saw one of the three planes limping in.

"The tail was almost shot away," she said. "Pieces of the skin were shot from the fuselage. Only one motor was working well. There were bullet holes all over. I didn't see how anybody could be alive in-

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In obsolete B-10s like this, Dutch fliers made combat history.

THE bombing airplane is an offensive weapon with which we can reach the enemy at vital points where no other weapon can reach him. It hurdles mountains and defies bad weather. It by-passes concentrations of enemy defensive ground weapons. It beats off enemy fighters by expert use of its own defensive armament. It goes over the top — envelops the enemy in a vertical plant.

The bomber's offensive fire has taken the form of missiles of many varieties—principally high explosive and incendiary bombs. It gets its maximum return—its greatest effectiveness — by scoring direct hits. Near misses may cause some damage; far misses may not even annoy the enemy.

Our goal is the destruction of those things which make it possible for the enemy to carry on the war against us. Such objectives, be they aircraft factories, steel mills, aluminum plants, oil refineries, transportation equipment or shipyards, must be made useless to the enemy. This requires destruction and destruction demands hits by properly selected munitions.

Thus we see the necessity for precision bombing—bombing that will get hits, and hits that will cause destruction. Some targets can be destroyed best by large demolition bombs. In others, more extensive destruction will result from a larger number of smaller bombs spread over a greater area.

Fusing is very important. Penetration is sometimes necessary, either into strongly constructed buildings or into the ground to damage water and gas mains, power conduits and subway facilities. In other cases, an instantaneous explosion at the surface will do great damage by blast and fragmentation effects. Still other targets may best be attacked by incendiaries causing destruction by fire.

Many targets cover rather extensive areas. This is true of many steel mills, of tank farms for fuel and oil, and sometimes aircraft factories. Yet, in most targets there is a vital spot, which, when destroyed, renders the major portion of the remainder inoperative or useless. It is true that many bombs which miss the vital spot will do great damage in the vicinity. Nevertheless, we must hit the vital spot and destroy the usefulness of the complete establishment to the enemy.

Thus, again, we must bomb by precision methods. We cannot annoy the enemy to death. We must make it *impossible* for him to carry on the war against us.

Asking for absolute precision bombing is asking a great deal. Release of bombs must be made from a correct point in space so that after many thousands of feet of vertical travel and many hundreds of feet of horizontal travel they will find their mark. To assist us in determining this release point in space, quite precise bombsights have been developed.

Like all precision instruments, the bombsight must be handled by specially and highly trained individuals. The bombsight is necessary as an aid to determine the cor-

THE SCOPE OF PRECISION BOMBING

By Colonel Edgar P. Sorensen

ASSISTANT CHIEF OF AIR STAFF, A-2

rect point of release but it must be handled with skill. It is improper and uneconomical to place precision instruments in the hands of operators who are unable to get the full value out of them.

A well planned bombing mission includes many elements. The targets selected must be such that their destruction will cause a maximum of disability to the enemy. To make its success relatively certain, much consideration should be given the size of the force sent on the mission and the tactics of its employment.

Economy of force is always a vital consideration.

Repetition of a mission should not be necessary, at least not until the enemy has spent much time and effort in rebuilding the destroyed facility. We must expect losses of aircraft and crews in practically all important missions. Too small a force or improper tactics, necessitating immediate repetition, only add to our losses. Enemy opposition can be applied effectively against our missions only to a certain numerical extent. If repetition of our missions is necessary, much of that same enemy opposition can be applied against us on each such repetition.

The success of a bombing mission requires not only precision bombing at the target but thoroughly coordinated teamwork by all members of the bombing crew and unit. Every man has his function to perform. The loss or failure of any crew member jeopardizes the success of the mission. The plane must be properly handled. Its engines and other equipment must function properly. Communications must be ready for instant use. Defensive gunners must be prepared to protect the entire mission. The navigator must find the target and the bombardier must see that his bombs hit it.

The number of sorties accomplished or

the tons of bombs dropped do not provide the criterion upon which successful bombing can be judged. Hits and the destruction of the enemy's facilities are what count.

The value of bombing accuracy can hardly be overstated. Every reduction of average bombing errors by one-half multiplies the bombing effectiveness by four.

Errors may be reduced by two major means. The first is by providing the most highly trained bombardiers and bombing teams. This factor is of extreme value under all circumstances. The necessity for it cannot be over-emphasized, nor can too much effort be expended to accomplish it.

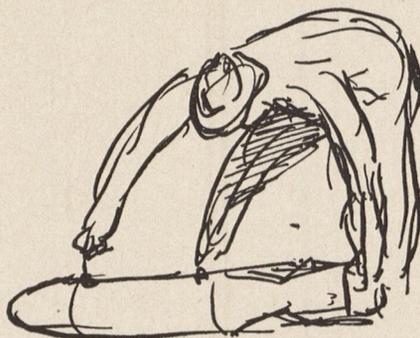
The second means of reducing errors is in the selection of the best bombing altitude. It is inevitable that bombing errors increase with altitude. Bombing errors at 20,000 feet are about twice what they are at 12,000; therefore, the effectiveness is reduced to one-fourth. The advantage to be gained by lower altitude bombing, however, must be balanced against the possibility of aircraft and crew losses due to anti-aircraft opposition both from the ground and in the air. Again, however, proper tactics will provide coordinated attacks which will neutralize such opposition.

In addition to the proper selection of targets, the designation of a proper force and the prescription of proper tactics and technique, there is the matter of proper bomb selection, the proper fusing of such bombs, the best use of existing weather conditions, the employment of fighter escort where practicable, and the planning of other coordinated missions which will cause a maximum dispersion of available enemy fighter opposition.

These precision bombardment principles are being translated today into widespread daylight raids by the Army Air Forces. Smashed railroad centers, shipping yards, war factories and other military objectives in Axis territory bear witness to the potency of precision bombing, which the Army Air Forces has come much closer to mastering than any of our enemies.

The excellent results of the Air Forces' bombing raids on Nazi-held Europe are a tribute both to the men and the unsurpassed planes they fly. But the best crews and the best planes in the world are a mere luxury if they cannot hit the target.

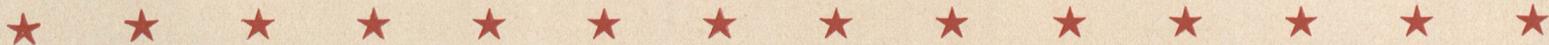
One plane that hits its target may be worth a hundred planes that fail.



How to Keep Well in the LIBYAN THEATER

Brigadier General David N. W. Grant

THE AIR SURGEON



With the successful prosecution of the war effort depending so heavily on the health of every officer and enlisted man, AIR FORCE has requested the Office of the Air Surgeon to prepare a series of articles on health conditions in the various theaters of operation, with emphasis on precautions vital to maintaining physical fitness. The following article is the first of the series.—THE EDITOR.

DISEASE is no respecter of individuals. Neither gunner, pilot nor commanding officer is immune. Illness can strike just as squarely at the heart of combat operations as the most devastating man-made weapon of war.

The medical service of the Army Air Forces has established certain standards of field sanitation and set forth immunization programs applicable to different parts of the world. Yet, these measures will suffice only if the individual takes every possible personal precaution.

An example of the many ways in which the individual may safeguard his health in theaters of operation can be drawn from a study of health hazards encountered in the Libyan Theater and of suggested methods to combat these hazards.

The health of troops living and operating in the Libyan Theater is generally better than can be expected in more normal terrain. Except in actual combat, however, the bulk of the troops do not remain in the desert proper but visit inhabited areas nearby, where native populations predominate, sanitation is poor and communicable diseases are prevalent.

Principal health problems in north Africa are related to the procurement and use of water. Excessive heat and lack of moisture in the atmosphere increase water consumption in an area where water is almost non-existent.

Except for water treated under the supervision of Army personnel, the water in this area must always be considered potentially contaminated with various organisms ca-

pable of causing such diseases as typhoid fever, dysentery, schistosomiasis and guinea-worm infestation.

Personnel ordered to this area should know one or two emergency methods of treating drinking water. If the facilities are at hand, water boiled from three to five minutes, or water treated with either halazone or the more satisfactory calcium hypochlorite, the same material used in Lister bags (F.M. 21-10), should be used. Remember, when using a chlorine method of water purification, much more chlorine will be necessary if the water is turbid or contains large quantities of organic material.

Of great importance is a thorough knowledge of the practical uses of water. The amount available is restricted and in forward areas each man may be allowed as little as one or two gallons a day. Moreover, with the exception of the larger coastal and river towns, only limited amounts are obtainable in the rear.

One or two gallons of water is a very small amount when it has to be used for all purposes: drinking, cooking, bathing, shaving, and brushing the teeth. Then, too, if forced down on the desert, you may have to get along on a quart a day. This can be done for four or five days without serious consequences.

THE necessary conservation of water under such circumstances can be accomplished by protecting the supply before consumption, and by conserving water after ingestion by limiting, as much as possible, fluid loss by perspiration. It will pay to form the habit of drinking small amounts of water slowly. Nearly all water that is consumed rapidly is thrown off in excessive perspiration and thus wasted. Small sips from the canteen moisten the mouth and throat and alleviate the first cravings for water. Chew gum if available but cut down on the smoking for it accentuates the desire for water. Moreover, become accustomed to salty water, for

you may have to add salt to your supply, usually three or four tablets to a quart, to make up for body losses due to perspiration. You will find that desert well water is usually very salty. Incidentally, strong unsweetened tea is an excellent liquid to carry in the canteen. Boiling the water in preparing tea guarantees the purity of this refreshing and thirst quenching drink.

Personnel should learn to differentiate between sunstroke and heat exhaustion. Either is easily prevented if the early symptoms are recognized by the individual or his companions.

Early signs and symptoms of sunstroke are headache, dizziness, irritability, dry hot skin, and seeing objects such as red or purple spots before the eyes. Sunstroke victims have a high temperature, and immediate steps should be taken to reduce this temperature to prevent death. Disrobe the victim in the shade. If no other shade is available, rig some clothing for a tent. Sponge the body with water and provide a cool drink of water. Sunstroke victims should be taken to a medical officer or ambulance as rapidly as possible.

Heat exhaustion and heat cramps are signalled by muscular cramps, pale, moist, cool skin, dizziness frequently accompanied by vomiting, weak pulse, dilated pupils, and shallow respiration. Place the victims in the shade, and lower their heads. They are in need of salt, so give them small amounts of fluids continuously such as hot tea or coffee to which large amounts of salt have been added.

Even though water is restricted in this hot, dry area, it is still necessary to bathe as frequently as possible. The skin-folds between the toes and in the crotch and armpits must be kept clean in order to prevent fungus infections such as dhobie itch. After bathing, dry the parts well, and apply powder—army issue foot powder is excellent for such use.

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Impostors in Uniform

By *Lieut. George F. Bradshaw*

CONSIDER now the case of Major X. First information on him comes from a private who was having dinner one night with friends in a New York restaurant. The Major was at the bar.

The Major had been at the bar too long. Otherwise he might not have come over and stood before the private's table.

"Soldier," he blurted, "what are you doing here?"

The private stood up. "Just having a bite to eat with some friends, sir," he replied.

The Major stared. "What outfit do you belong to?"

The private told him.

The Major shook his head. "I don't believe you," he said.

Where the scene might have gone from there is anybody's guess, but just then a couple of the Major's friends hauled him away.

Now the private had good connections. The next day he told his Colonel what had happened. The Colonel, being a moderate man, hit the ceiling. "You find out who that guy is," he said.

So back to the restaurant went the private the next night. The Major was again at the bar. The private knew the owner. "Jack," he asked, "who is the Major?"

Jack was full of information. The Major was a famous flyer. "And look," Jack exclaimed, "he has just been given the Distinguished Flying Cross."

Sure enough. There was the D.F.C. ribbon.

So the private figured he'd forget the whole thing. After all, why make an issue of a situation in which the principal is something of a hero. Besides, maybe the Colonel would consent to forget, too. The Colonel did.

Another scene took place in New York's most famous night club. Our Major X was again at the bar. The discussion centered on phonies who wear uniforms.

The Major reached into his pocket and pulled out his identification cards. "Here's one way you can always tell," he said authoritatively. "Just ask to see a man's papers. A real officer has these with him, and he's got them with him *all the time.*" For emphasis, he pounded the bar.

The Major lived high, wide and handsome. Last Fourth of July, for instance, he was a special guest in a test run up the Hudson to West Point in a Navy PT boat.

And, he had become, quietly enough, a

Lieutenant Colonel, letting himself in for the usual congratulations and a quantity of free drinks.

But silver leaves weren't enough. Two weeks later he appeared with the eagles of a Colonel. At that, even his night club companions became curious.

"How come?" they asked.

The new Colonel was almost bashful in telling about it. "I was down in Washington and George (Major General Harold L. George, Commander of the Air Transport Command) said I was doing such a heluva swell job that he took a pair of eagles out of his pocket and told me to wear them."

Some of his companions gagged at that one. This was just too much. It wasn't long before the Provost Marshal's office was notified. The Colonel was turned over to the proper authorities.

After the Colonel's "record" had been given a thorough going over, it was obvious that he had no connection with the Air Forces whatever. The Colonel was just a guy who liked a pretty uniform. He had been a commercial photographer, which explained his ability to forge identification papers.

IT'S HAPPENING all the time. The Provost Marshal's office and the F.B.I. are picking up fake officers by the dozens. And a good proportion of them wear Air Forces insignia. The wings, it appears, are romantic.

Every phony has his reason. A few of them are crooks, but a good proportion get dressed up just out of vanity. When you

Catching up with the phonies who masquerade in military dress to ring the bell socially and financially.

are a bona fide member of the armed service and know how tough it is to keep your official papers straight, you wonder how anybody would dare to pull a fake. But plenty of them do.

Not all of them aspire to be officers. Last summer, out in Hollywood, an enlisted man stepped into high life for a few weeks.

"Stepped" isn't quite the right word. He came in on crutches.

One night at a radio broadcast, he asked if he could be introduced to Cecil B. DeMille. Mr. DeMille was delighted, asked him to come around to Paramount Studios next day and watch shooting.

So he arrived, crutches and all. He watched Mr. DeMille for awhile and then was taken to the set of Miss Claudette Colbert's new picture.

He made an instantaneous hit. He was a nice-looking boy, modest, and wounded, of course. His story was that he had been struck in the head by a piece of shrapnel seven months before, and had been paralyzed by the blow. He was then waiting to be sent to Johns Hopkins Hospital for an operation which, by a slim chance, might relieve the pressure and permit him to walk again.

He wouldn't talk of his troubles. He just smiled and said, "Well, it's a war. Somebody has to get hurt." The whole cast and crew fell for him. He became their personal hero.

He had his picture taken with Miss Colbert, with Fred MacMurray, and other stars. He made a recording of his voice and Miss Colbert's. He was wined and dined. He came back day after day and sat quietly on the set.

Our hero let more than a week elapse before he got to work. Then one day, after

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Important

The unauthorized wearing of the uniform of the United States Army or any distinctive part of it is punishable by fine, imprisonment, or both, under Section 125 of the National Defense Act.

A soldier who has reasonable cause to believe that a person wearing the uniform of the Army is an impostor should not attempt to arrest such suspected impostor, but should report the facts to his company commander, the Military Police, or, if neither of these is available, the local police.

Weyman C. Cramer

MAJOR GENERAL,
THE JUDGE ADVOCATE GENERAL.

IMPOSTORS

(Continued from Page 13)

he had left, the director of the picture approached the cast. "Look," he said, "we've got to do something about this. While our young friend was hitch-hiking into the studio this morning, he lost his wallet, either dropped it or had it stolen. There was \$170 in it, everything the boy had in the world."

There was proper audience reaction.

"Now," said the director, "let's take up a purse. We can all put in a little bit and never notice it." It was agreed.

But Miss Colbert wondered. Why was the Army permitting a wounded hero to hitch-hike all over town? And why, if he got hit in the head with a piece of shrapnel, didn't he have some sign of a scar?

When she thought aloud she got some scornful looks from the rest of the cast. That Colbert, they said, here's a guy who's been risking his life to defend us and now she . . .

So Miss Colbert made out a check for a sizeable amount and put it in the hat. "All right," she said. "Only do one thing. Before you give him the money, call up and find out about him."

Her suggestion was carried out. The fellow had given an address to which the photographs and recording were to be sent.

A landlady answered the telephone.

"Him?" she said, "why he left here two weeks ago to go down to Long Beach to get a job. Wounded? What are you talking about—He's never even been in the Army."

INNUMERABLE cases could be cited. A "Major" in Chattanooga. A "Ferry Pilot" in Newark. A "Flying Tiger" in Los Angeles.

And two Air Corps "Second Lieutenants" in New York. These last two were pretty ambitious fellows. They had been draftees, both stationed at Fort Bragg; one had gone over the hill in December, 1941, and the other in May of this year. They met in a bar one fine evening. Each was terrified that the other would learn the truth about him. Each was then wearing an officer's uniform.

But they managed to arrive at an understanding, and from that time on they teamed up. They had a merry six weeks before the F.B.I. caught up with them.

They left a trail of \$1,100 worth of bad checks and unpaid bills in hotels and night clubs in New York and New Jersey. They just missed buying a car with an \$1,800 bad check, because they could not obtain a priority. They had stolen identification cards from a Lieutenant and a Captain.

One of them met a dancer in Albany, and from Newark sent her a \$154 diamond ring he had purchased with a rubber check. On the side, he stole war savings stamps from his mother.

The F.B.I. caught up with them in Atlantic City.

So it goes. War and expanding armies bring out the uniforms. And a few of the boys get them the easy way. Too easy.



A B-26 flies safely with one motor stalled and the blades feathered.

Single Engine Operation

By Lt. Col. J. B. Duckworth

COLUMBUS ARMY FLYING SCHOOL

WHEN a pilot is flying a twin-engine plane and one engine fails, he must remember above all else:

NEVER SACRIFICE SPEED FOR ALTITUDE!

You can lose control of heavy, high horsepower, twin-engine airplanes from nothing but loss of airspeed. If a rate of 30 or 40 miles per hour over the minimum single engine operating speed is maintained, no loss of control can result. The ship can be banked steeply into the dead engine and be as solidly controlled as though both were in use.

The amount of airspeed necessary over the minimum single engine operating speed depends upon the altitude in which the aircraft is placed (such as a steep bank), which engine is down (thereby controlling torque), the amount of aileron being used, and other factors. For instance, if the airplane is stalled with one engine operating only, the torque of the other engine tends to "throw the airplane over on its back" and more and more rudder control is necessary to prevent this tendency. As the airplane approaches the complete stalling speed, full rudder is finally being used and when the rudder control becomes inadequate, the torque of the operating engine will tend to throw the airplane over. The use of aileron in such a situation involving low airspeed does not help but rather increases the tendency of the airplane to go over.

Therefore, when you experience the loss of one engine, the first thought should be adequate airspeed. If near stalling speed when the one engine fails, it may be necessary to cut the operating engine rather than allow it to pull the airplane over on its back.

If any altitude whatever is available, your first move, rather than open the good engine, should be to shove the stick forward to gain adequate airspeed. Once that is achieved, you can satisfactorily go through proper single engine flying procedure.

If just off the ground, you must have minimum single engine operating speed. With such, you can by quick action climb the plane on one engine. But in such action your primary thought must still be airspeed.

Thus, a cardinal rule, in the event of an engine failure, is to put forward the

wheel until sufficient velocity is obtained.

Once adequate speed is achieved, the pilot's next problem is directional control. To obtain this with safety—use only the rudder. Use of the ailerons at low speeds tends to put an increased drag on the inside wing, which only adds to the difficulties caused by engine torque.

Consequently, the second cardinal rule is to forcefully use the rudder to obtain directional control, leaving the aileron alone. If adequate airspeed under the conditions obtained already has given full control to both aileron and rudder, this rule ceases to be important, but inasmuch as the danger spot occurs at lower airspeeds the rule should invariably be adhered to.

Only after adequate airspeed and directional control are secured should a pilot go into the normal single engine operating procedure—namely, opening of the pitch control, opening of the good engine, trimming of the airplane, and so forth.

Admittedly, a pilot experienced in single engine operating procedure will react automatically and will obtain airspeed and directional control practically at the same instant that normal procedure is adopted. However, a great deal of practice is necessary for accomplishment of all operations at once. And the slightest failure to gain sufficient speed and directional control first may be the difference between success and a fatal crash.

(In practicing single engine flying always allow for a substantial loss of altitude in order to maintain airspeed in restarting a dead engine and for unfeathering. The safe altitude for acrobatic flying should be considered the minimum altitude for single engine practice flying.)

Disregard of these principles may result in the airplane being thrown over on its back, with a resultant spin. It is then difficult to get the stick all the way forward and cut both engines. If these things are not done the spin may easily continue. With the modern airplane, high wing loading and high horse power result in a great deal of torque and heavy weight; and as these factors all add up to high kinetic energy in a spin or spiral, many thousands of feet may be required for a complete recovery.

STEWART FIELD has no stately trees, no ivy-covered buildings, and very little tradition.

There's no time for tradition. Not now. West Point is "souped-up" for the duration. And, though only a few months old, Stewart Field, the Air Forces Basic-Advanced Flying School at the U. S. Military Academy, is as much a part of West Point as the East and West Buildings, the assault course, and the mule mascot of the football team.

The first group of cadets to be trained at Stewart began work on August 25 of this year. Wheeling BT-13A's out onto the runway, they took off from a field which was then, and still is, an air field in the raw.

Stewart Field was once the city airport of peaceful, historic Newburgh, New York.

Today, like many other Air Force fields, it is a boom town—a scene of cement and gravel, planks and blueprints, and the litter of fresh construction.

Bulldozers are everywhere — uprooting tree stumps, jogging out rocks and boulders, leveling great hunks of ground. Laborers in overalls and enlisted men in fatigues bustle in all directions. Army trucks swarm over neighboring roads.

On the south side of the field, half a hill has been cut away. There are scores of new red-brick buildings and the wooden frameworks of more to come. Flanking this col-

WINGS of WEST POINT

By Capt. Charles D. Frazer

Cadets take to the air as the Military Academy inaugurates flight training program at Stewart Field.

ony is a 700-acre plateau, a broad L-shaped table-top, which soon will hold 6,000-foot runways. There is much to be done at Stewart. Construction will not be complete until September, 1943.

But already, from the welter of dust and dirt, there has taken form in the granite-filled mountains above the Hudson River a school which may well play a starring role in the future of the Army Air Forces.

The origin of the school dates back really to 1927, when an Air Corps Detachment at the Academy was first authorized. The detachment consisted of a few officers and enlisted men, a few amphibian planes, and a couple of hangars along the river bank.

But this was not enough for those Army fliers. "Ducks" were all right, but they wanted land planes, too. Unluckily, the country around West Point was too hilly for a suitable field.

They began to talk about Newburgh 12 miles to the north. In 1930, Samuel Stewart had deeded some land to the city and a

cocktail napkin of an airport had been built. It was small but it would do.

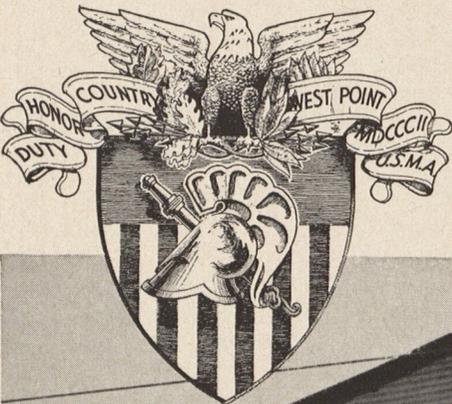
For several years the Air Corps Detachment used Stewart Field as a base, and eventually, in 1937, plans for its expansion were developed.

Last fall, General George C. Marshall and Lieut. General Henry H. Arnold decided to introduce flight training as an elective in West Point's course of instruction. Flight training thus became the only major elective at the Point.

Obviously, Stewart had to become a field second to none in equipment and facilities. No one can foretell the number of cadets who may have to be schooled there during the war. In peacetime it should be able to provide full aerial training, primary, basic and advanced pilot work, plus both single and multiple engine experience.

The directors at West Point took a good hard look at their old blueprints, threw them away, and ordered new ones. They decided to move the hill. Instead of two hangars, they planned 10. They visualized mile-long runways that would accommodate any type of plane, up to the heaviest bomber. They projected all the manifold housing and recreational needs of the officers, instructors and enlisted men stationed there.

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AIR RESCUE in Jungle Country

By Captain Oscar Schneller

SENIOR FLIGHT SURGEON

A PATROL bomber was down — somewhere in the Dutch Guiana jungles. The plane, with eight officers and men, had taken off at midnight from its base in Guiana, on a secret patrol mission along the coast. Nearly two hours had passed. No word had come in. Trouble was certain.

To the flight surgeon at an outlying Air Forces base, the phrase "plane missing" is an ominous challenge. It is like hearing "wanted in emergency" over a hospital loud-speaker. If there has been a crash, men's lives will depend on swift, decisive action.

Fears for the crew of the bomber were confirmed when the plane which should have been relieved of patrol duty returned to the base. No relief had appeared, no message had been received. Through the night, our field made ready for a search.

At dawn several search ships took off from the base. Less than an hour later, the missing plane was sighted about 28 miles to the east, apparently badly cracked-up. We did not know whether anyone survived the accident.

Captain Ernest Ljunggren, operations officer, and I left immediately in a C-61 to survey more closely the scene of the crash and to determine, if possible, the best way of getting help through to the crew mem-

bers, should they be alive. Meanwhile, Captain Richard Gunckle, commanding officer, had organized a rescue squad which was sent out on foot with native guides.

Flying at tree-top level, we soon located the patrol plane. It had cut a jagged gash in the jungle and bits of wreckage were scattered all about. Two of the crew were alive, at least—for we could see them sitting on what was left of the tail.

We cruised low over the surrounding country. The nearest clearing of any size was six miles away. But this was too small.

Finally, about 10 miles from the crashed plane, we came upon a savannah that was spacious enough to offer some hope. By a pre-arranged signal, Captain Ljunggren notified the other planes that we were going to attempt a landing.

Then, gently and skillfully, Captain Ljunggren set the plane down into the clearing and brought it to a stop after a short, hard-bumping run. We rolled our ship to the edge of the savannah and prepared to enter the jungle, following a compass reading we had taken in the plane indicating the direction of the crash from the savannah.

Captain Ljunggren took with him a .45-calibre pistol, 50 rounds of ammunition, a compass, a head net, and two cans of rations.

I carried 50 rounds of ammunition, two tins of rations, and a first aid kit. We both had machetes, and ration cans to be used for water.

Starting into the jungle at 7:30 in the morning, we encountered heavy going. The trees and undergrowth were almost impenetrable, much of the ground underfoot was swampy; here and there were little streams we had to ford. Most of the streams were infested with alligators and man-eating fish. It was ticklish business.

Literally hacking our way along, we kept going, slowly, mile after mile, until dark. We then made a bed of palm fronds and slept, alternating two-hour watches.

At dawn we started off again and began firing shots at intervals. Around nine o'clock we heard answering shots from a machine gun and, cutting in toward the sound, discovered we had nearly passed the scene of the crash while a few hundred yards away.

Frankly, we did not expect to find many of the crew alive. But we were due for a surprise.

Captain Charles H. Ross, pilot and Lieutenant Roy A. Webb, co-pilot, were the only members of the crew able to walk, and all the others were lying by the side of the fuselage in a tiny clearing, several of them badly hurt. But all, fortunately, were alive. The group included Lieutenant Charles L. Jones, observer; Technical Sergeant Louis Castro, bombardier; Sergeant Gerald Forman, crew chief; Sergeant Herman Goldstein, radio operator; and Privates Albert K. Will and Andrew W. Budinsky, gunners.

Examination of the injured men disclosed several serious fractures of jaws and ribs, brain concussions, lacerations, contusions, and bruises. I gave the whole crew first aid and treatment for shock, then chlorinated some water from a nearby stream so our supply would be ample.

CAPTAIN ROSS told us what had happened. The plane, apparently in good shape, had taken off on a direct course to the point of patrol and risen to 1,500 feet. About 15 minutes later both motors had failed without warning.

After trying vainly to discover the trouble, Captain Ross told the crew to prepare for a crash landing and maneuvered his plane into a shallow glide, giving Sergeant Castro a chance to get out of the nose.

Suddenly, the big plane knifed into the jungle with a terrific impact. All the men were knocked out. That they were not all killed outright was due only to the skill of Captain Ross in bringing the plane through that welter of trees, vines and underbrush.

Lieutenant Webb was the first to recover consciousness. Sergeant Castro's feet were in his face. They both had been thrown clear of the ship, into the jungle, a short distance from the fuselage.

Inspection of the plane revealed complete wreckage. The entire nose had been ripped away, both wings had been shorn off, and the two motors had been hurled into the undergrowth. Part of the fuselage was in-

tact, although badly bent at the tail. Gasoline drenched the ground. The plane had been carrying a sizable load of bombs but none had exploded.

Captain Ross recovered consciousness a few minutes after Lieutenant Webb. Although injured themselves, they carried the other men to a place that had been cleared away by the crashing bomber, where Captain Ross gave them what first aid treatment he could with the plane's kit. Some of the crew were only semi-conscious when Captain Ljunggren and I reached the scene, a day and a half later.

Clearly, there was no time to be lost in evacuating these men. Captain Ljunggren said he thought he could take off from the savannah in which he had landed the C-61 and would take along Lieutenant Webb, who was in the best condition of the injured crew. I gave them a list of the medical supplies and the food and litters I would need.

Even though the trail had been cut through, it took Captain Ljunggren and Lieutenant Webb several hours to retrace

A flight surgeon gets a look at the rough side of Dutch Guiana and helps bring a bomber crew back alive.

the 10 miles to the plane. But, just before dark we heard the drone of motors and saw them circling overhead, the signal that all was well and they were en route to the base.

Meanwhile, I was busy doing what I could for the men. I gave them stimulants from a special kit and stopped the severe bleeding from which many suffered, cleansed and bandaged the deeper wounds, avoiding suturing as much as possible because of septic conditions.

Despite this treatment, however, it was clear that our plight was serious. All the men were suffering badly from shock. Quick hospitalization was imperative.

At dawn the following day another plane flew over, signaling that it would drop supplies. Soon a huge bundle of litters, blankets, food and the like floated down to us by parachute, making a perfect bull's-eye through the hole in the trees.

Not long after the rescue party from the base arrived. There were 20 infantrymen under Lieutenants Arthur, Lemon and Calhoun and 15 native guides. It had taken them two days to cut their way through 28 miles of dense jungle and they had been able to do it only because planes had flown over them from time to time, indicating the direction to follow. So heavy was the foliage that they had been unable to see the planes much of the time but took bearings from the sound of the motors.

It was quickly decided that evacuation by foot through the jungle would be too arduous and take too much time. Our best bet was evacuation by air from the savannah in which Captain Ljunggren and I had landed.

After the rescue group had rested, we bundled the injured men onto litters and began our trek, with some of the infantrymen and guides leading the way, cutting the trail wider for passage of the main party.

It was late afternoon when we reached the clearing. I set up a first aid station and made the men comfortable. More planes appeared to drop food to us. We spent a miserable night, for the place was infested with sand flies against which even head nets were no protection. Nobody slept.

NEXT morning Captain Ljunggren flew over in a medium bomber and dropped a note requesting that the clearing be surveyed to determine if he could land. Captain Ross examined and measured the ground. He decided, that with some more clearance work, the plane could safely come in.

This job of slashing down underbrush and vines and laying out and marking a runway with stakes took about three hours.

Then, as Captain Ljunggren flew over once more, the men waved a signal that the field was ready. The plane swept low toward the clearing but couldn't make it. Captain Ljunggren circled, tried again. But again he changed his mind and pulled up. At last, on the third try, he brought the ship in for a perfect landing and came to a stop just short of the danger area.

The bomber would hold three men at a time in addition to Captain Ljunggren, Lieutenant Wilhite, and Technical Sergeant Holmes. So a fast ferry service was begun, with the plane taking off and landing in an incredibly small space on each trip. After the injured men had been transported, the infantrymen and I returned in the same manner. The native guides came back over the jungle trail.

At the field hospital the men's wounds were dressed and sterilized, and shock treatment was administered. The patients rested for 24 hours and were transferred by plane to the Trinidad Base Hospital.

There was nothing spectacular about the medical side of this evacuation. The work was commonplace, everyday flight surgeon's work. But the evacuation itself was a significant example of the kind of rescue being duplicated again and again by the Army Air Forces, on a wide variety of fronts.

Because Captain Ljunggren and I were able to fly into jungle never before visited by white men, a severely injured air crew received first aid that was urgently needed. Because planes could fly out quickly from the base, we had a constant supply of food, medicines, blankets, litters, and other necessities. Because planes served as guides, a rescue squad reached the accident on foot in much less time than it would ordinarily have taken. And, finally, because a bomber transported the men to a hospital in a matter of hours rather than days or possibly weeks, many valuable lives were saved and the total illness time substantially reduced.

Yes, every man recovered and is back at his flying duties. That to a Flight Surgeon means a battle won.

OLD BAG OF BOLTS

(Continued from Page 7)

arrival. Pilot Funk decided to go to a satellite field in Burma to escape a possible followup attack. Luck was with Bolts. That night the Japs raided Rangoon three times. The return to Java with General Wavell was easy.

Singapore fell and the Japs began their first raids on Java. The raids kept Bolts on the alert staying away from her field while the Japs strafed it. When the air raid alarms came, Bolts would lumber out to the runway, take off and fly south over the water and wait for the all clear to be given.

Then Bolts was ordered back to Darwin, departing February 19, the day of the big Jap raid. About two hours out of Darwin, she got radio information warning her not to come in, so she landed a few hundred miles to the south, waited, and then came into Darwin shortly after the attack.

When the Japs went to work in earnest on the invasion of Java, Bolts was called upon for evacuation work. Twice she went back into Java from Darwin, bringing out

20 evacuees each time. Luck continued to ride with Bolts. The day after she left Broome, Australia, with the last lot of passengers she had taken out of Java, Broome suffered a heavy raid. After it was over, she went back to Broome under cover of night to bring out personnel.

Bolts made a second trip to the Philippines. This time she took in sorely needed supplies for the wounded who had escaped fallen Bataan and Corregidor. In addition to her crew of seven, she brought out 30 officers and men from that secret airfield on Mindanao, including Lieutenant John Bulkeley of Navy PT boat fame.

That was her last trip for the Ferrying Command. Within a few days her crew was called back to the States and Bolts was turned over to the Commander of the Southwest Pacific. When Lieutenant Funk and Bolts parted company they had been together nearly 400 hours.

Bolts made one more daring trip after that, back to the Philippines in another rescue attempt. It was her last.

The gas load gave Bolts only a few minutes to locate the Mindanao airfield. She

circled overhead, trying to get a signal through. The Japs were everywhere; perhaps they had taken the field. Bolts didn't make contact in the darkness. She headed back toward Australia.

But Bolts couldn't make it back with the remaining fuel. She headed toward an island for an emergency landing. Her position was radioed to aid in the rescue of her crew.

Then Bolts gave out of gas. She sat down in the water a few hundred feet off shore. After more than 600 hours her motors sputtered for the first—and last—time. And then only because she lacked fuel.

Members of her crew swam to safety and later were rescued by a submarine. Beyond saving was A. C. Serial Number 40-2376.

They don't hand out awards for airplanes, and we don't mean to get sloppy sentimental over a big hulk of steel, but in our books *Old Bag of Bolts* went down with a Congressional Medal of Honor pinned to her fat chest.

The ranks of the officers and the grades of the enlisted men mentioned in this story were those held at the time the action took place.

AIR MINISTRY publications have dealt at some length with conditions to be expected by personnel going to the United States. Now the flow is in reverse. American forces are coming to this country. We are the hosts, not the guests.

The arrival of large contingents of American forces, and their impact on us, will make adjustment of attitude and outlook necessary.

There will be occasions of irritation on both sides, not because one is British and the other American; but because they are people.

There is as much likelihood of such friction between two Englishmen, or two Americans, as there is between an Englishman and an American. We are not yet, thank the stars, regimented out of our personalities.

When we are, the Nazis will have won a major victory for their philosophy.

At the same time, looking at the broad issue, we may be required to discipline our personalities because fifth columnists, spies, Nazi propagandists and all subversive groups will fasten with delight on any indication of impaired collaboration.

In this country, the British have the larger share of responsibility. There will naturally be an element of personal selection in our likes and dislikes, just as there is between Briton and Briton. There will be different stresses and a different outlook. Some are personal, some are economic. Americans will not be Anglicised overnight. For one thing, they don't want to be; for another,

THE AMERICAN CONTINGENTS

A Briton's Message to British Airmen

by Fletcher Allen

there would be no gain if they were.

Americans have a different vocabulary, a different tradition, a different accent. There is as much difference, however, in these matters between Yorkshire and Sussex or California and Maine. Notwithstanding such differences, the United States builds up into a unity, as Britain builds up into a unity, and local variations are accepted as being in the family. Nations are much more than the sum total of acreage and population.

Quarrels still occur between individuals; there is a fair amount of scuffling in York, and in New York. Some of us go on a "binge," so do some of them. Neither has a monopoly of bad language, nor of good manners. We're just human, showing to better advantage, possibly, individually, than in bulk. Whether individually or in bulk, the point of departure is the realization that we are two strong peoples, with the virtues and faults of our strength, pulling together, anyway because we must, and learning to pull together because we like to.

There are some other points of potential misunderstanding. One is—cash. American rates of pay are higher

than ours. That should certainly not be a personal grievance between individuals. It may be the American's good fortune and allow a greater latitude than we can always rise to. The Americans are, incidentally, usually good spenders and do not like to be thought "fumlbers." Mostly, when they are lavish it is without any desire to flaunt their higher pay. More often than not it is a liking to share out.

Another human interest enters. There is an understandable tendency among some of our young women to find a stranger who speaks our language entertaining. The girls in the United States and Canada are showing a similar interest in our lads. That is an individual matter, and not one on which generalization can be made. Some of our American visitors will certainly make friends among the girls. We cannot reasonably expect them to become recluses, or be unresponsive.

We tend rather to understatement. The Americans like emphasis that not infrequently sounds like exaggeration. Emphasis is not always line-shooting, any more than understatement is always efficiency gone modest. They may be equally powerful expressions, according to temperament and custom, of the same pride and purpose; but each form takes an understanding by the other fellow.

As individuals, we are concerned with the details of collaboration. It is for the Governments to deal with the broader issues, but if individuals fail in their job the Governments cannot succeed.—*Condensed from the Royal Air Force Journal.*



Wright Field

THE words "Wright Field, Ohio" are renowned among airplane designers, builders and fliers the world over.

They are all but magic words because they stand for 15 years of successful pioneering on the technical frontier of aviation, because they mean high quality design and performance, and because they stand for airplanes like the Flying Fortress that executed a successful mission and still flew home with 1500 bullet holes in its wings and fuselage.

If you're going to deal with Air Force materiel—and that's everything from bombers to bolts—you're going to have to deal with Wright Field. There all the equipment the Air Forces use was either conceived, developed or tested—tested and retested—at the Materiel Center near Dayton.

In many ways Wright Field is the spawning ground of American air power. On its designing boards and in its fluorescent-lighted labs are spun the cocoons that hatch weapons for aerial warfare on all the fronts.

The tail of the B-19 dominates this view of a flight line at Wright Field. In the background are laboratory buildings and planes of many types and sizes.

Wright is a Battlefield

AT FIRST GLANCE Wright Field looks more like a Hollywood movie lot than an air base. Great cranes swing engines, parts and whole planes overhead; big bombers waddle behind small motor tugs up the paved, city-like streets that run between the lab buildings; grotesque shapes of testing devices cast futuristic shadows over the landscape.

Out on the flight line Messerschmitts and Spitfires are lined up beside the P-40s and B-26s. Labs contain the latest German and Jap equipment taken from planes shot down over Allied territory. At Wright they've taken everybody's plane apart to see what makes it tick.

In the great labs of Wright Field there is a battle going on—just as much a battle as those fought over Kiska and Cologne. Here military and civilian technicians match their wits and energy in a deadly contest with the aero-engineers of the Axis. Upon their success or failure may hinge the outcome of this war.

You can tell how hard they are trying to win from the lights that gleam from lab windows all night long, and from the roar of prop and engine testing that

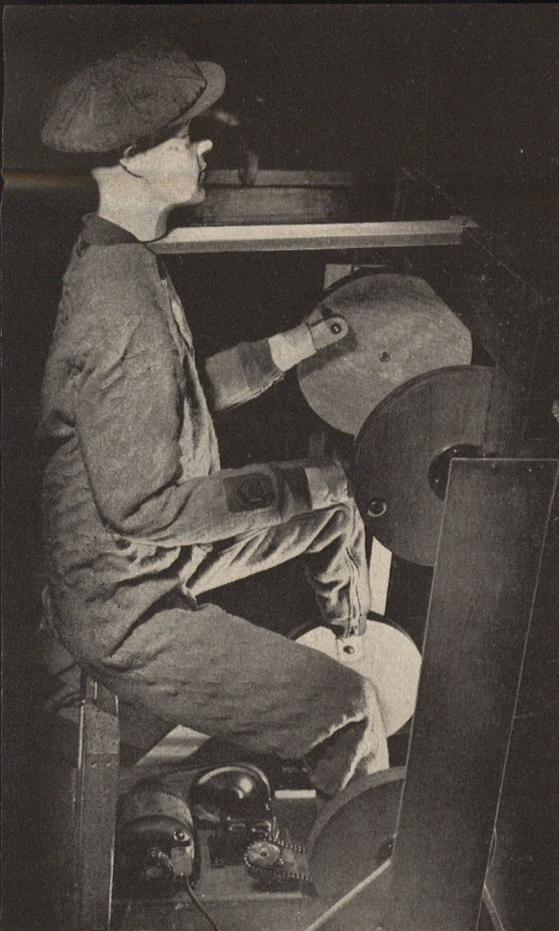
fills the air around Wright 24 hours a day.

Boss of Wright Field is Brigadier General A. W. Vanaman, who works directly under Major General O. P. Echols, Commanding General of the Materiel Command. Helping General Vanaman with the engineering phase of his job are Brigadier General K. B. Wolfe, Chief of the Production Division, who supervises the mass production of all Army warplanes, and Colonel F. O. Carroll, Chief of the Experimental Division, who runs the research and development program of the Materiel Command.

To aid General Wolfe and his Wright Field staff control the manufacture of Army planes, the Materiel Command has divided the U. S. into four Procurement Districts (Eastern, Central, Midwestern and Western) each with a District Supervisor and a staff of factory representatives that handle Air Force interests on the spot. These districts, together with Wright Field headquarters, are responsible for meeting production schedules, supplying parts and tools in sufficient quantities, and issuing change orders on contracts to keep factories abreast of latest aeronautical developments.

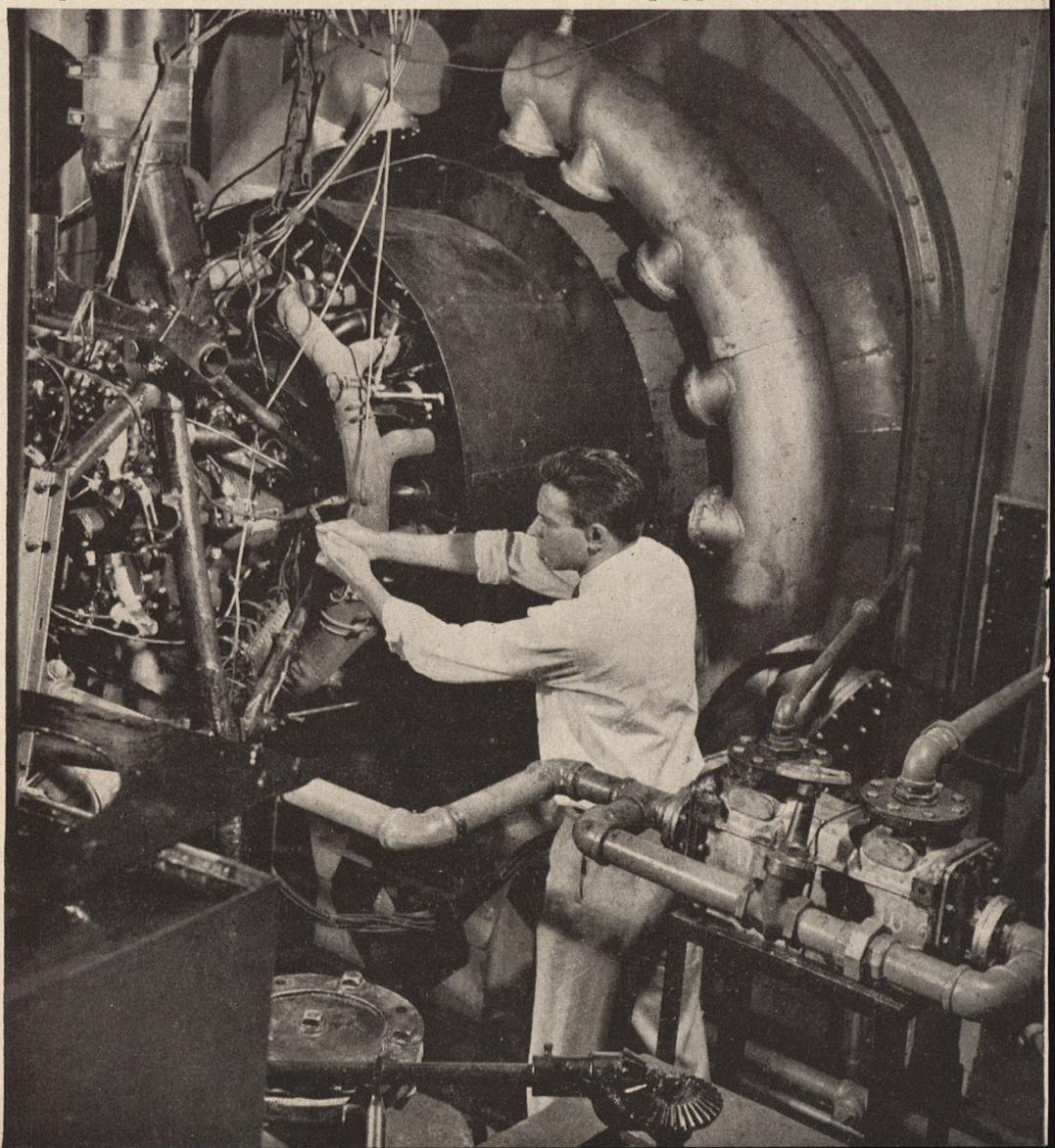
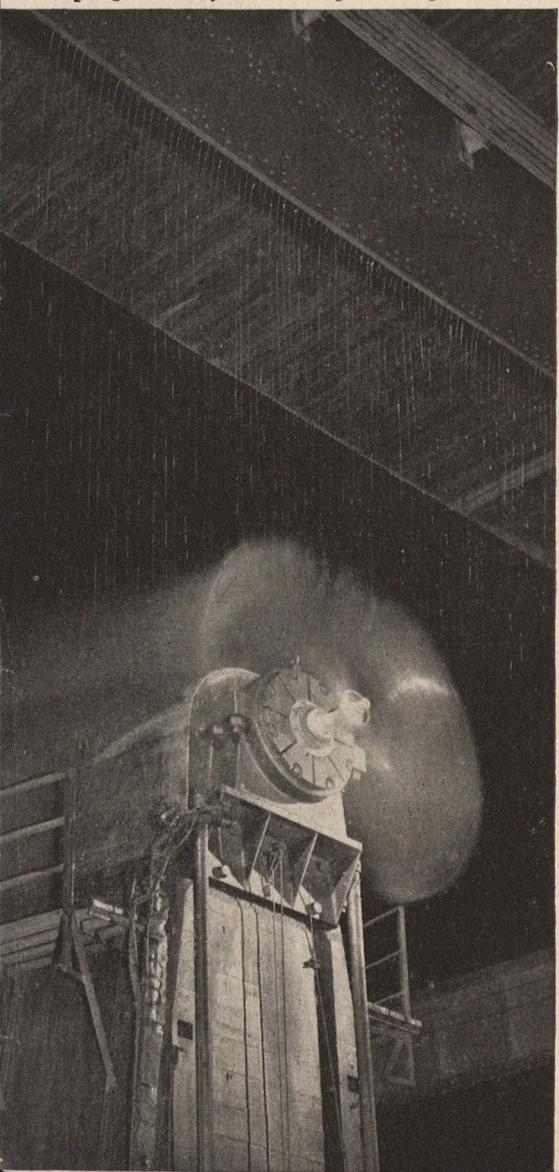
The radial engine below is being placed on a test stand for a trial run to determine its operating characteristics. In this test,

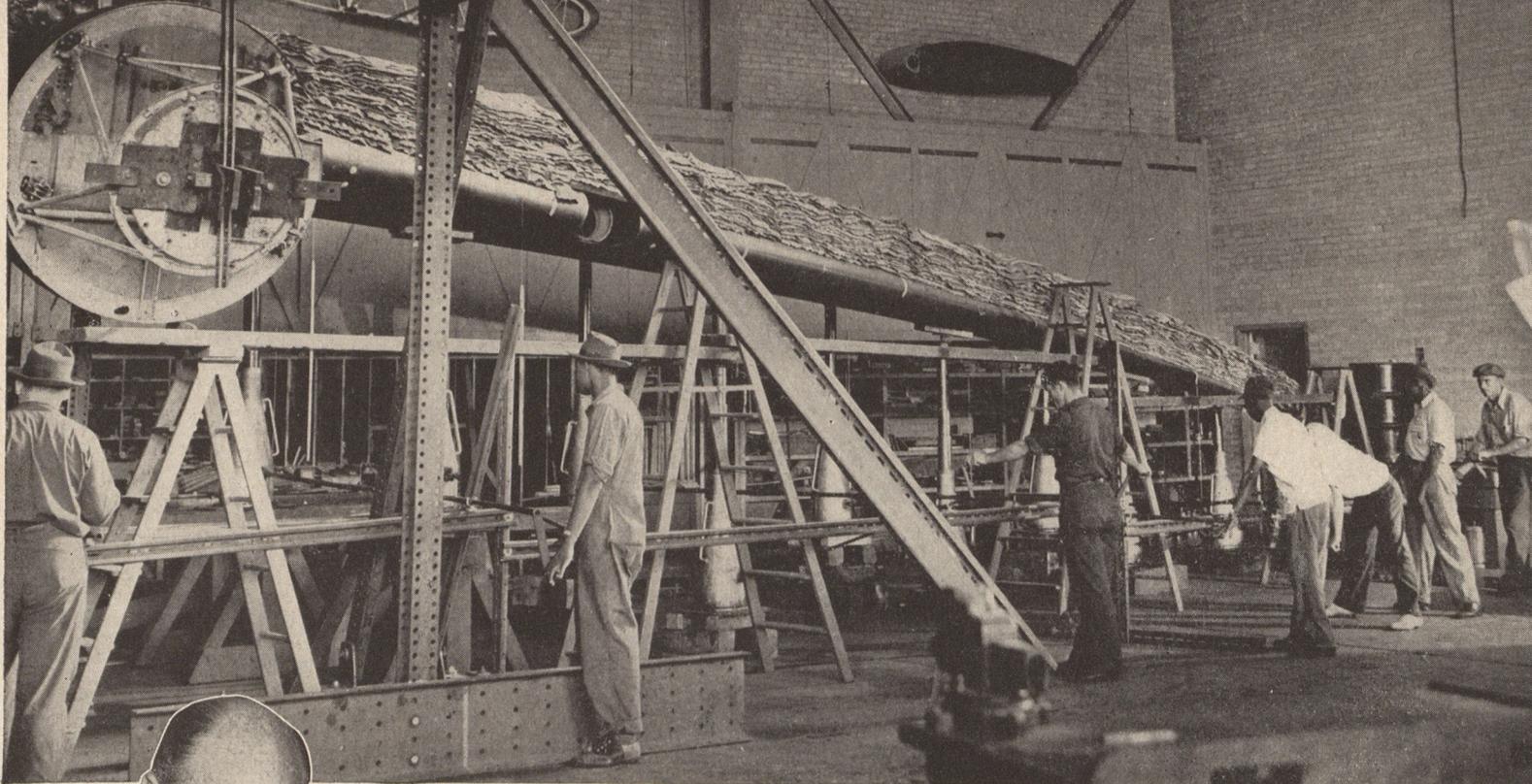
the engine pulls, not against a propeller, but against a specially-constructed dynamometer equipped with water brakes.



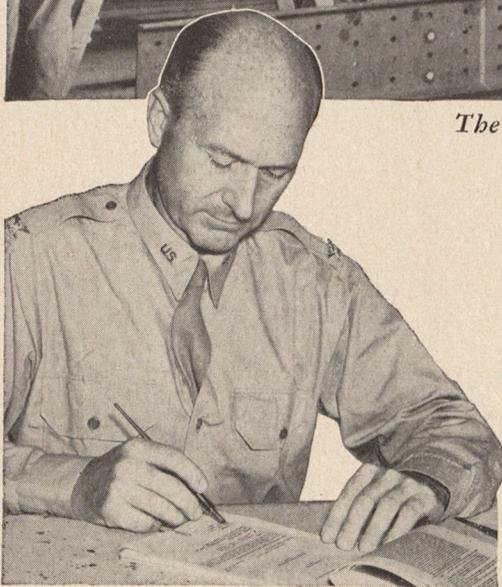
Meet "Horatio"—the mechanical man who works 24 hours a day testing flying suits.

Made-to-order rain is used to test this prop's ability to hold up in rough weather.





The 10-pound bags on this C-47's wing show how many "Gs" it will take before cracking.



ENGINEERING isn't the whole story. In addition to the laboratory and production work, all Army Air Forces materiel contracts are written and awarded at Wright Field. This is a big job, and it involves a lot of money.

The man who handles it is Colonel A. E. Jones, Materiel Command Contracting Officer, shown at left affixing his signature to a typical Air Force contract. As one of the country's two or three top spenders, Colonel Jones has signed or supervised the signing of all AAF materiel contracts since 1939. During this period of time he has controlled

the expenditure of many billions of dollars.

Colonel Jones, who has contracted for as much as 400 million dollars worth of aviation equipment with but one swish of his pen, once signed all Air Force contracts himself—now he needs 51 assistants.

In his efforts to buy exactly what the Air Forces want, Colonel Jones works in close cooperation with the engineers of Wright Field, who draw up detailed specifications of all proposed purchases. These "specs" are part of the contract, and no variations are permitted unless a change order is issued by the Contracting Officer.

This shelter hood keeps the weather and prying eyes away from a secret project.



WINGS OF WEST POINT

(Continued from Page 15)

Then the dirt began to fly. Ten months later, on August 25, Stewart Field, "Wings of West Point," was dedicated.

The field was rough and full of debris, but it was ready. When Major General Francis B. Wilby, superintendent of West Point, summed up the significance of the occasion, he called the decision of Generals Marshall and Arnold "one of the most momentous in the history of the Military Academy, if not in the life of the nation."

Since that hot August afternoon, day after day a steady stream of BT-13A's has kept the air about West Point churning with activity.

There are 245 cadets in this first group of students. They are in the class of 1944. Ordinarily, they would have two years of training ahead of them.

But West Point's course has been shortened from four years to three, so these men will graduate next June, a year ahead of time. Somehow, they must get in their flying time, must absorb the rudiments of aerial navigation, bombardment, and kindred subjects, and at the same time must keep up with all the other studies at West Point.

These courses include chemistry, modern languages, mathematics, physics, history, military art, military engineering, military history, mechanics (including thermodynamics and fluid-dynamics), ordnance, economics, government, military topography and graphics, military law, military hygiene, military administration, theory of flight, weather, and the tactical employment of Air Forces. That, understand, is in addition to the instruction they receive for flight training which takes in navigation, meteorology, aerial mapping and photography, code and communications and, of course, actual flying.

Each cadet in this first class at Stewart took primary flight training at a civilian school. Chances are, he gave up his summer furlough to get it. No primary instruction will be scheduled at Stewart for awhile.

TODAY, the flying cadet lives at the Point and pursues the routine of his class. First call is at 5:50 a.m. At that time, the cadet arises, gets dressed, polices his room, and stands reveille at 6 o'clock. Breakfast is at 6:30 and by 7 o'clock he's on his way to Stewart Field for flight instruction. He leaves the field in time to stand noon formation at the Point, eats lunch, and gets to class at one o'clock. After three hours of class, he may either get practical field exercise or continue an additional two hours of directed study. At five, he leaves the classroom, dresses, stands afternoon formation, and eats the evening meal. Then comes a precious 25 minutes that are unscheduled—the cadet's own. At 7:30, call to quarters, and two inspections before 10 o'clock taps.

The second class men, who are doing

their basic flight training at Stewart Field, must also recite each day in mechanics, three mornings a week in chemistry, and two or three afternoons a week in languages. If it rains, the cadet gets an additional two hours in military topography and graphics—one hour to study and one hour to recite, for the West Point system is based on a recitation and grade for every man every day, not a quiz now and then.

The average day, outlined above, is Monday through Friday. Saturday is usually half-day, but in many cases the flying cadet uses the week-ends—including both Saturday afternoon and Sunday—to make up some of the flying hours he might have missed because of bad weather. The command at Stewart Field is exceptionally careful never to send cadets into the air when the weather is threatening.

An advanced flight training course will be activated at Stewart Field in December.

The cadet now taking his basic will begin advanced training on New Year's Day, 1943. He will continue his ground school work, taking such subjects as photo interpretation, identification, armament, gunnery and bombardment.

Next June 1, he will get his wings as a pilot and, at the same time, graduate from the Military Academy with a complete background of military education.

By then, younger classmen of the Point will be coming along and Stewart Field will be in full swing.

This speed-up of instruction at the Academy has been accomplished by close scheduling of study periods and by wartime elimination of certain activities, such as the famous and impressive dress parades.

Today, Colonel John M. Weikert, commandant of the flight school, is worried about one thing—weather.

"Winter is hurrying us," he explains. "After a certain time up in this country, you simply can't pour concrete. But if we can't pour concrete for the new apron, let

us say, we'll just finish up with gravel and keep going." That seems to be the whole spirit at Stewart Field—keep going. Nothing else could have brought about the results already visible.

More than a hundred buildings have been erected. This fall has been one "Grand Opening" after another. One day it would be the opening of the PX. Another, the first service chapel on the hill. Another, the first night of the camp movie theatre.

ENLISTED men, assigned to Stewart for duty in school and service squadrons, had to be housed for months in a "tent city" in woods bordering the field. But just before cold weather set in, the camp was struck and the men all moved happily into brick barracks. Bachelor quarters and a club for officers have since been completed.

The principal concern of the officers directing Stewart Field, of course, has been the actual airplane and training facilities. Almost all these are completed or nearing completion—runways, hangars, operations headquarters, storage rooms, a control tower, Link Trainer buildings, ground school classrooms, libraries, and the rest. Three auxiliary fields are in the making.

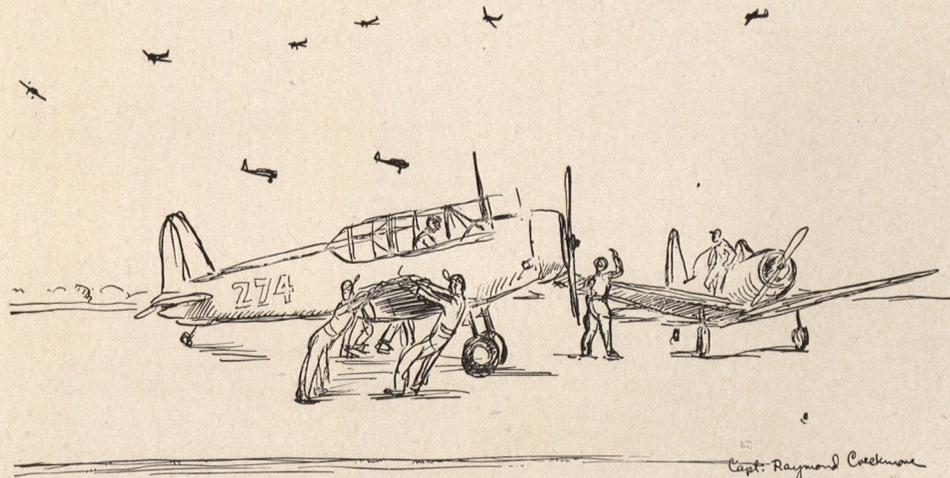
When construction of Stewart Field is finished next September, 200 officers and 1,800 or more enlisted men are expected to be on duty there. From 250 to 300 cadets should be in training by that time.

Right now, Stewart is strictly on a wartime basis. Every man on the field, civilian or officer, "G.I." or cadet, is in a big hurry. A sign at the road entrance reminds them that "Hitler Won't Wait."

The men training in this first class are in a special hurry. They are going places, preferably to the points marked by arrows on the front of a hangar, where signs read "To Berlin—3,121 Mi." and "To Tokyo—8,117 Mi."

This atmosphere, come to think of it, is a tradition in itself—a logical heritage for the new, raw "Wings of West Point." As one officer at the field puts it:

"Some day Stewart will have some ivy, too."



Capt. Raymond Cookmore

AIR FORCE, December, 1942



Attack bombers strafing an armored column on desert maneuvers.

PRELUDE TO DESERT COMBAT

By Major John McL. Redding

THE desert floor is sparsely clothed with stunted growth: cactus, mesquite, Joshua trees, sage brush and Palo Verde. The soil consists of sand and rubble from the mountains. Like an abandoned brickyard, the loose rock and shale make traveling by foot virtually impossible.

Tanks and half-tracks have supplanted the Gila Monsters and jack rabbits as denizens of the desert. When these armored monsters move they mark their progress by towering walls of dust. But when they remain still the tanks and half tracks blend into the desert floor. With rudimentary camouflage, tanks melt from sight in an unbelievably short distance.

From the air, at 3,000 feet, it is impossible to pick out a stationary tank. An entire armored regiment, if properly dispersed, cannot be spotted. From the air the desert floor seems bare.

"The explanation," explained Colonel R. H. Lee, who led the Second Air Support Sub-command in recent desert maneuvers with the Armored Force, "lies in the distortion caused by the heat."

"When I first flew over this area last May I couldn't see a hiding place anywhere. But the truth is that the whole desert is one

America's air and ground forces are learning to adapt the fickle ways of the sand country to the requirements of modern warfare.

huge hiding place for vehicles that remain stationary. Ground commanders should always remember that. If they let the dust settle and remain stationary the planes above cannot pick up their dispositions."

This is one of the lessons learned in the desert by the Air Forces Air Support units. They have learned too that it is impossible to tell the difference between tanks and trucks from normal heights when the vehicles are in motion. The heat waves emanating from the superheated sand destroy all form for the eye.

"But," Colonel Lee pointed out, "There's one thing to remember. When you see a dust cloud, and you can't safely come down to look the column over, there is much to be learned by just watching the dust.

"If it billows along in a solid wall, that's a truck column. If the dust wall is marked by curling spires of dust, it indi-

cates track-laying vehicles—tanks or half-tracks. But you can't always be sure. There's a little trick they pull out here. They have the peeps dressed up with paper maché coverings that make them look like light tanks. They drag empty gas cans and logs behind them to help stir up dust. When you run into anything like that from the air you must be very careful. Otherwise you'll have your people out chasing the paper tanks while the real ones smack you somewhere else."

Air support is the big problem of the desert maneuvers. The United States Army in the western desert of California is trying to develop a combination ground-air striking force that can move with speed and power. The highly mobile tank units can strike and be gone within a margin of minutes. To be effective, combined tank and air operations must be co-ordinated to the split second.

The low-flying elements of the air support unit must strike immediately in front of the advancing tanks. They must be devastatingly swift. The attack lasts only a few seconds; then the tanks and the armored infantry take over. From there on in, with

(Continued on page 34)

Technique

A Monthly Review of Technical
Developments in the Air Forces

SUBSTITUTES

A Short-Cut to Victory

CRITICAL shortages of raw materials are more of a challenge than an obstacle to engineers of the Army Air Forces and the aviation industry.

The biggest challenge so far—the aluminum shortage—is being conquered by the successful introduction in large quantities of plastics, plywood, fiber, steel and wood into airplane manufacture. The use of these materials saved over 30,000 tons of aluminum up to September 1, 1942. The substitution of wood for aluminum in training plane propellers alone has saved over 250 tons of this vital aviation material.

The next biggest challenge—rubber—is being taken care of just as successfully. The discovery and utilization of non-critical materials have so far reduced crude rubber consumption on over 600 different items of equipment, and completely eliminated its use from over 250 more. The largest single saving of rubber—10,000 tons—was accomplished through the development of a new self-sealant for fuel tanks that requires 25 percent less crude rubber than formerly.

This big saving has been augmented by

such other "tricks" as substituting plastics and leather for rubber-coated fabrics in cushions and linings, by using felt on seat pads, by eliminating rubber grips from control sticks on certain airplane models, and by utilizing linoleum in the manufacture of bombardier's window mats.

Such discoveries do not come accidentally. Thousands of tests are involved: flight tests, wind tunnel tests and laboratory tests. In the battle to save aluminum, AAF technicians went over every airplane in the Air Forces with a fine tooth comb and microscope. They changed name plates to plastic, compass parts to bakelite, conduit clips to hard fiber, trim tabs and cockpit flooring to fabric-based plastics, and camera parts, instrument cases and hose connections of oxygen masks to steel and plastic.

But aluminum and rubber are not the only materials for which substitutes have been adopted. In two plane types, 33,700 pounds of copper have been eliminated through substitution. Over 420,000 pounds of nickel was saved when the exhaust system of the B-17 was changed to stainless steel.

High-grade chrome and nickel is being conserved through the use of lower grade steels that need little or none of the critical materials normally required in ferro-alloys. Bolts, for instance, have been changed from a nickel alloy steel to a less critical molybdenum steel without interfering with the performance characteristics of the airplane.

Other materials, critical because of supply, processing or shipping reasons, are being conserved on an ever-increasing scale. In July the Air Forces cut down its requirements for high octane gasoline by 5,175,000 gallons, its mica requirements by 565,000 pounds, and its silk needs by 98,208,000 square yards.

Throughout the search for substitutes, engineers have conducted hundreds of tests to assure the maintenance of adequate safety margins. Some substitute materials have resulted in increased weight, some even in greater strengths than the materials they replaced. Generally, engineers of the AAF Materiel Center at Wright Field believe that all substitute materials now being used on production lines are at least as good as the materials they replaced.

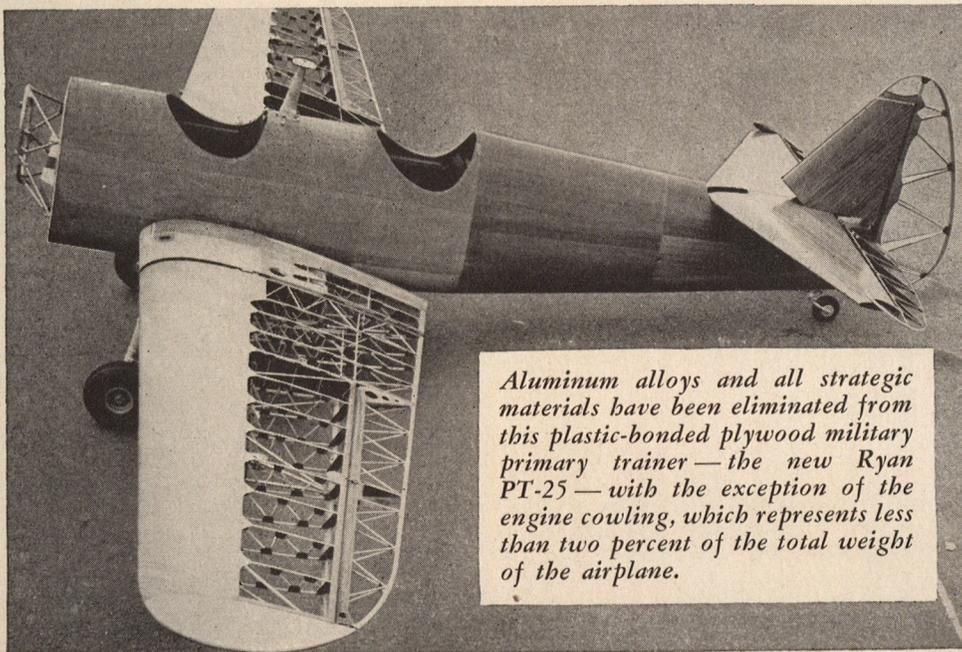


One-Man Laboratory

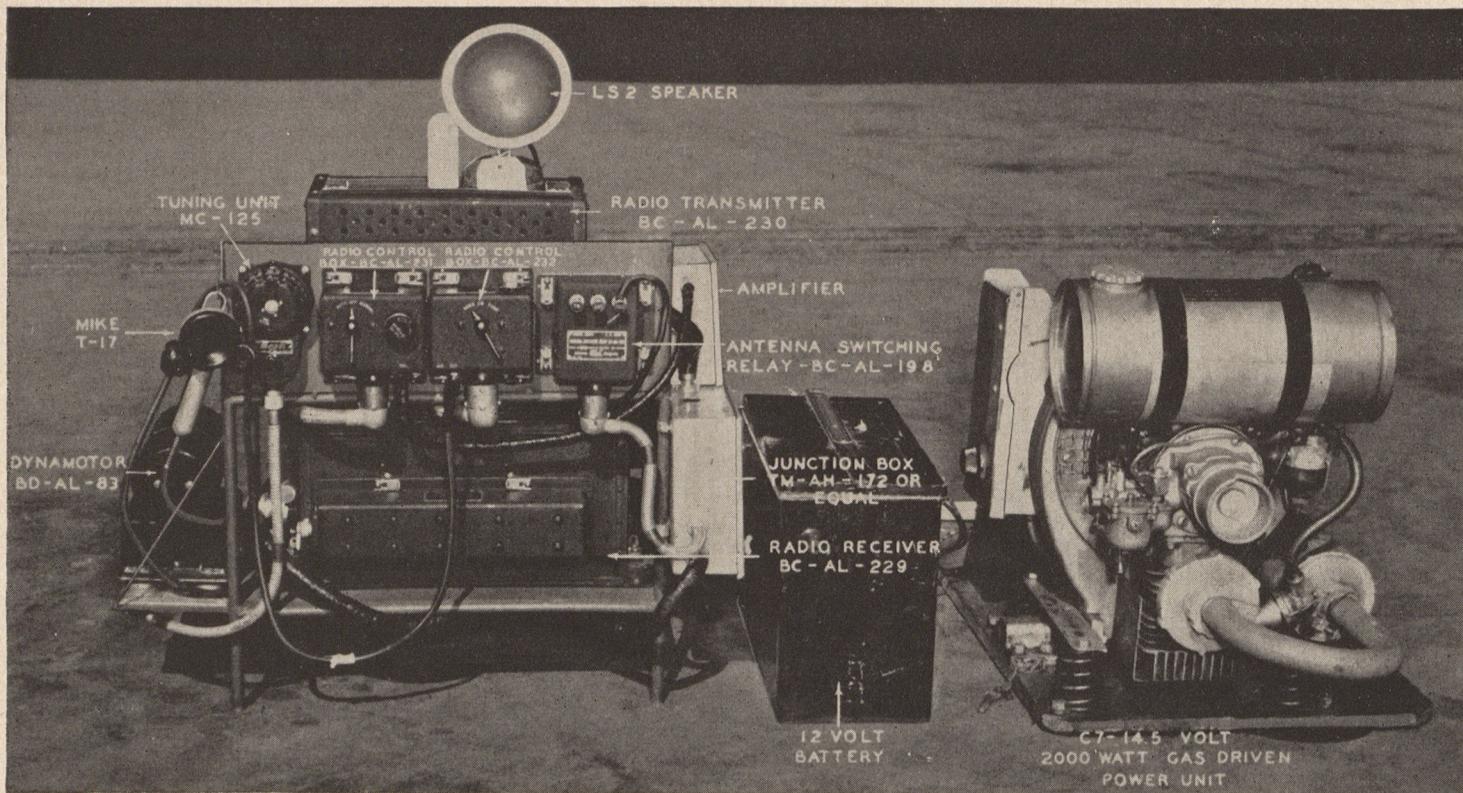
MASTER SERGEANT DAVID SAMIRAN (above) of Wright Field is a one-man research and invention laboratory. Since coming to the Field in 1928 he has taken out patents on 14 inventions which are in standard use by the Air Forces, and has 21 more applications now on file.

One of Sergeant Samiran's most important inventions is the segregator device used to separate water from the gasoline used in Air Forces planes. He began work on this system as far back as 1921, and has gradually developed it until today his segregator pumps (carried in gas trucks) can deliver 210 gallons of gasoline per minute into airplane fuel tanks. Standard Air Forces gas trucks now have two segregator pumps, permitting one truck to fill planes at the rate of 420 gallons a minute.

Sergeant Samiran's segregator is based on the principle that water is heavier than gasoline. Each segregating unit has a separator which floats on water but sinks in gasoline. The water, therefore, sinks through this separator and drains out the bottom of the container while the gasoline remains above on the inside.



Aluminum alloys and all strategic materials have been eliminated from this plastic-bonded plywood military primary trainer—the new Ryan PT-25—with the exception of the engine cowling, which represents less than two percent of the total weight of the airplane.



Gunter Field's new radio communications unit.

Flexible Radio Unit

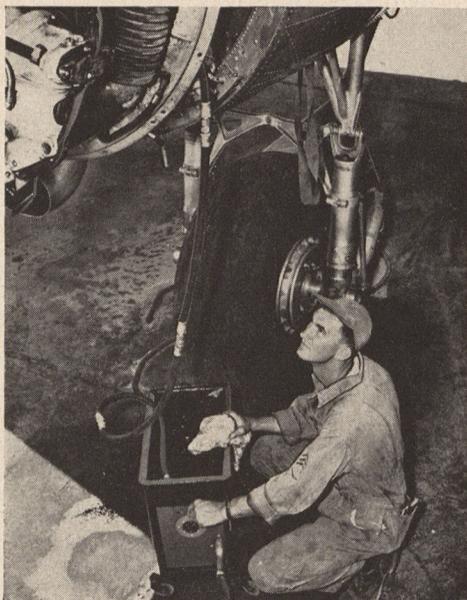
COMMUNICATIONS flexibility has been achieved at Gunter Field, Alabama, through a transmitter-receiver radio unit designed by the staff of the Post Communications Department.

Originally designed as an emergency control tower unit, the transmitter-receiver, with its compactness, light-weight and mobile features, has proved invaluable in many other phases of operations in and around air fields. Its simple design permits inexperienced personnel to set up the outfit and quickly put it into operation.

At Gunter Field the device has proved very efficient in locating the scenes of airplane crashes. This is especially true in mountainous or forest-covered terrain where the spotting plane, after locating the wreckage, conducts a radio-equipped command car to the crash via the shortest route.

The unit has also proved extremely successful in controlling air traffic for night flying. When auxiliary fields are used, a reconnaissance car equipped with the unit may be dispatched to the field and used as a base for ground-to-air communications from radio set SCR-AL-183. Another use has been discovered by the Gunter Field Provost Marshal, who utilizes it on his military police cruising cars. These cars, making their patrols on the post and in nearby Montgomery, keep in constant touch with the city police radio, the post military police headquarters and the control tower.

The original device was built under the direction of Lieutenant W. R. Sturges, and has since been improved by Lieutenant R. J. DiMartino, Post Communications Officer, and the personnel of his department.



Sergeant Wiplinger operates the new "mechanized" pre-oiler

No More "Burn-Outs"

ENGINE "burn-outs"—long a curse of aviation technicians—have been almost eliminated at the Albuquerque Air Base, New Mexico, by means of a mechanical "pre-oiler" developed by Captain William Hamrick, Chief of Albuquerque's Engineering Division, and Staff Sergeant Bernard Wiplinger.

Every time a burn-out occurs it means a new engine must be installed while the damaged one is removed, crated, and sent to an air depot for rebuilding, with a consequent wastage of valuable time, mechanical skills, and equipment. Often planes with burned-out engines are out of service for a week

or more. This, to Captain Hamrick and Sergeant Wiplinger, was a situation that could stand correcting, and they set out to do something about it.

First they studied the cause of burn-outs and found that most were attributable to the haphazard and varied methods by which most AAF engines were oiled before flight. Since this was done manually, it was impossible to achieve any kind of uniformity and guesswork was often resorted to. Periodic burn-outs were the result, sometimes within 15 minutes after engines had been tuned up.

In his search for an answer to the problem Captain Hamrick went first to the commercial airlines. Although their system proved impractical for AAF adaptation, it did provide him with an idea.

After experimenting with the idea on an assortment of pumps, solenoids, power units and other miscellaneous equipment, he was finally ready to begin construction. This was Sergeant Wiplinger's job. From a selection of used airplane parts he made the first machine, consisting of a pump energized by a battery unit, an oil reservoir with a capacity of two and one-half gallons, a hose attachment and a set of regulating instruments, all controlled by a central switch.

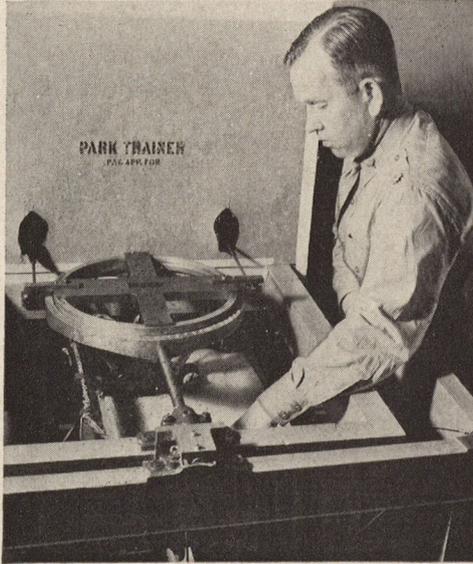
After a number of preliminary tests and final adjustments the machine was given a final test in actual maintenance of "line" planes. It was a success. Over a period of two months 15 planes were pre-oiled with the machine and not a single burn-out resulted. In addition, the time required for pre-oiling was reduced from two hours to approximately 15 minutes.

Plans for the standardized use of Captain Hamrick's pre-oiler throughout the Air Forces are being formulated.

Park Trainer Aids Aerial Photography

ONE of the most valuable pieces of aerial photo equipment to come out of AAF laboratories is the Park Trainer—a photographic training device invented by Lieutenant Colonel W. Sidney Park, formerly of Lowry Field's photographic school.

The Park Trainer is to the aerial photographer what the Link Trainer is to the aviator. Simulating actual flying conditions, it



Colonel Park Inspects His "Trainer"

gives prospective aerial photographers a thorough realistic training on the ground before they take the air.

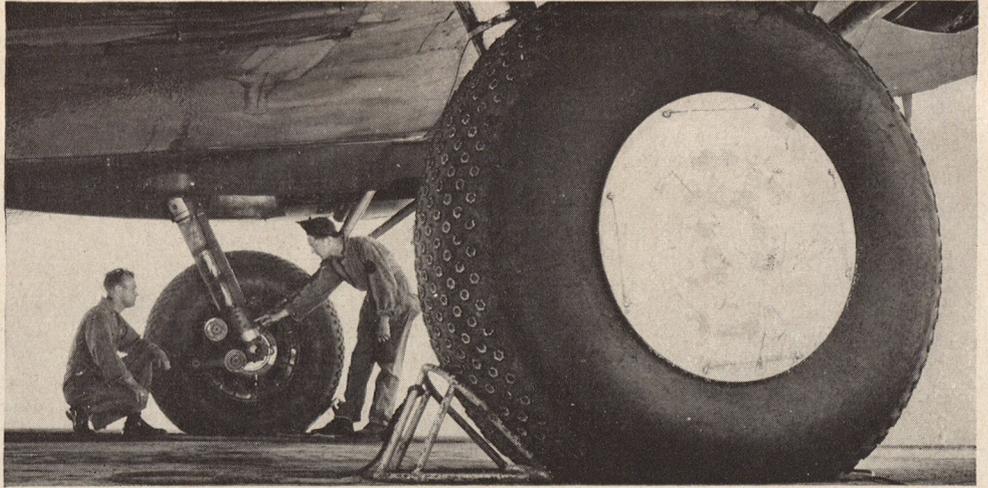
Operation of the trainer is intricately clever. A cabin is equipped with a standard camera and view finder. An image of mosaic, or aerial map, moves across the ground glass in the view finder in the same manner as the landscape moves across the view finder in a real airplane. The cabin can be tilted, and "crab" (turning of the plane into the wind to offset drift) can be introduced to require corrections by the photographer.

Pictures are not actually taken by the device, but it does record how accurate actual photos would have been. In these calculations it automatically records the crab and tilt the student had to overcome.

"An average student," says Colonel Park, "will have obtained sufficient practice after about 10 lessons of 15 minutes each to take vertical mapping pictures as well as the man who has a great many hours of actual experience in the air." This shortens considerably the long hours of flight training usually necessary for aerial photographers.

This is not the first venture into photo experimentation for Colonel Park. He has also built the Park aerial precision camera and is a veteran of over a quarter-million square miles of flying shutter work. He is now on duty at Bolling Field, Washington, D. C.

The colonel began work on his trainer before he came into the Air Forces two years ago.—Sgt. Jack Angell, Lowry Field.



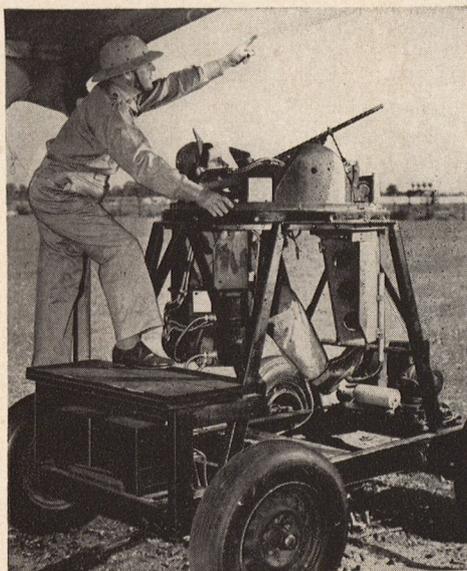
Because conventional airplane tires having all-rubber treads usually skid on slick ice and snow, a new type tire with sharp cylindrical inserts that look like beer-bottle caps are being manufactured for the AAF to guarantee safe winter landings on northern airfields. A pair of the new tires, with their "ice-grip tread" visible, are shown above.

New Photo Fluid

OUT of the dark room of the Photographic Section, Shaw Field, S. C., has come an improved photographic developing formula which not only removes defects in over-age film but increases sharpness of detail.

The formula was discovered after a month of patient experimenting by Corporal Steve Gouzeas and Pfc. Clarence Leino. It is a developer formula that provides for normal film speed, good tone range, normal contrast and fine grain. Even when photographs are enlarged up to a hundred times their original size, they still retain their detail and contain a minimum amount of grain.

In the new mixture, which is called "Lego," there is a preponderance of sodium sulfocyanate. According to its discoverers a new formula can be mixed at a cost of 75 cents a gallon and it has excellent keeping qualities.



Captain L. B. Whitfield, MacDill Field, shows a prospective gunner of the Third Bomber Command the finer points of aerial gunnery on his turret-mounted shotgun.

B-17s Get New Filter

A NEW air filter, developed by Colonel Leslie G. Mulzer, commanding officer of the MacDill Field Sub-Depot, Florida, has simplified maintenance of the Flying Fortress and increased engine efficiency by 300 to 400 percent.

The filter, perfected and first put into experimental use at MacDill Field, is now standard equipment on all B-17s.

By covering the air intake opening and preventing particles thrown up by the propellers from accumulating in the engine, the new device has kept sand and grit out of the carburetor induction system and greatly lengthened the operational period of Fortresses between overhauling.

Before adoption of the filter the average period of operation for B-17 engine was 40 hours. Colonel Mulzer's invention has boosted this time to as high as 700 hours, by minimizing the wear on the piston rings.

"Our chief trouble before," the colonel explains, "was feathering of piston rings, but the filter has counteracted this."

ALASKAN OFFENSIVE

(Continued from Page 5)

He'd have to be a weather-hardened poet, to be sure. The Aleutians are up where the weather begins. Strictly impartial, the weather protects friend and foe alike. But too often the unpredictable mists that sweep over Kiska Harbor provide the Hirohito clan with the afternoon, and sometimes the next day or two, to repair the damage that bombers and fighters have spent all morning inflicting.

Crewmen of the Air Force up there don't bother to pray for impartiality, or decent weather. All they ask is half-decent, even tenth-decent weather—any kind of weather that will give them two or three shots at Kiska the same day; if possible, for two or three days in a row.

BUT after a summer and fall of it, the Air Force has grown used to the weather and used to life in the Aleutians, despite the fact that life goes on pretty much the same day after day. After Dutch Harbor, headquarters became the advanced base from which land-based planes operated during the raid. On that gray, treeless island, home became a tent dug in against strafing, and friendly rivalry developed over whose tent would be best prepared for the hard winter. Revetments were dug around each tent; lumber was carefully "salvaged" to make doors and sketchy flooring. The grass that tried to grow during the summer turned out to be a pale green in color; a patch of radishes planted for a "victory garden" sent up sprouts only one inch high in three months.

Wells were dug almost anywhere to furnish cooking water. The water was close to the surface and digging was easy. The men even found a way to take a hot shower. They dug up a 55-gallon water tank, fitted it with intake and outlet spigots and attached it to a pipe of icy water. When the water reached the right level they poured fuel oil on top and tossed in a match. After a decent interval of pyrotechnics, they could risk a warm, if somewhat smoky, shower bath.

Life on the base has always been dominated by the constant raids on Jap installations. And the long list of decorations awarded since Dutch Harbor proves that the Air Force takes its chances on fog and ice and tricky crosswinds, on long hops over water cold enough to freeze a man in 20 minutes, and on all the Zeros and ack-ack the Japs can get into the air.

"For repeated day and night over-water instrument flights during icing conditions in the Aleutians to attack an armed enemy," is the phrase most often used in official citations. "Going the full range of the ship without regard to the safety margin of fuel," is another phrase that appears regularly. Citations describe "flights in bad weather under a ceiling of from 50 to 300 feet in an attack on an enemy naval concentration." Still others cite transport missions carrying personnel and vital supplies, flying unarmed and unescorted over hostile areas

patrolled by enemy craft. The list of citations is long. Many of the awards have been posthumous.

Weather be damned, the battle is being won. The occupation of Attu, Agattu and Kiska islands has been hard to crack.

But Jap installations did not long remain a lengthy over-water jump from the Dutch Harbor area. Something new developed in the Aleutians.

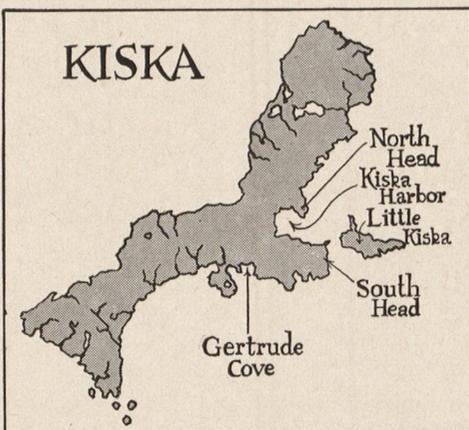
It started one morning as August drew to a close, when a strange collection of American surface craft was herded within the protecting area of its convoy. The collection ranged from huge transports to the little tug towing a four-masted schooner loaded to the gunwales with gasoline and a thousand and one miscellaneous items. Curtained by fog, the surface vessels headed westward.

Not a Jap plane marred the murky sky or a Jap warship the gently rolling sea as the convoy crept at a snail's pace past the rocky shores of the Andreanof Islands. The armada reached the shelter of the island harbor without a shot being fired.

THE rattle of the anchor chains in the hawse pipes had scarcely died away before the troops under full field equipment clambered down the rope nets into the landing barges. Driving rain and high seas soaked most of them to the skin but also assured the absence of enemy air attack. Soon anti-aircraft and coast batteries were set up along the low hills to support the guns on the ships covering the landing operations. Jeeps, command cars, trucks and caterpillar tractors began splashing toward the beach.

There were not enough trucks to go around, but that didn't stop them. From pilot to tail gunner, crews pitched in and carried, mostly on their backs, all of their equipment from the beach to the airfield that was fast taking shape under the noisy pushing of the Engineers' bulldozers and cats. Then for 10 days the men of the Air Force ate out of tin cans and got by with only snatches of sleep.

The expedition landed on a Sunday morning, August 30. The fighter planes—peashooters they call them—dropped out of the sky September 11 onto as smooth a run-



way as could be found anywhere—that is, anywhere in the Aleutians. Two days later came the B-24s. Although the Japs on Kiska did not know it, the mission that paid them that blasting visit on historic September 14 took off from an island airfield that had been nothing but an uninhabited waste of tundra-covered volcanic rock just 15 days before.

That was the occupation of the Andreanofs, which based the Army Air Forces some 200 miles from Kiska Island.

It didn't change the weather. Nothing could change that. But the occupation of the Andreanofs placed the Air Force within fighter striking distance of the Japs in the Aleutians. It permitted scenes like this:

In his headquarters hut on one of the Andreanof islands, Major Wilbur Miller, fighter squadron commander, sat at the end of his cot and leaned against his "desk," improvised from an empty ammunition packing box, while he called the roll from a pocket notebook on his knee. Squadron pilots, many of them with Jap planes to their credit, answered quickly as their names were read off. Stuffing his notebook back in his pocket, Major Miller tore off a piece of wrapping paper from a package under the cot and sketched a rough semi-circle representing Kiska Harbor.

"You all know that harbor well enough by this time," he began in a tone as conversational as though he were outlining a training flight instead of the plan for the next day's mission, "so I won't need a map. Here's the dope for tomorrow.

"We'll follow the photographic ship over and rendezvous five miles southeast of Little Kiska." He outlined a circle route east of the harbor and drew a line. "We'll come in on the south side of Little Kiska," he said.

NOW, our objectives are anti-aircraft guns alone this time. The bombers have been getting it pretty heavy and we've got to knock off every gun we can before they come over. We'll have two minutes to get in and out before the bombers are due so we'll have to get out of the way fast."

He looked up to impress his audience and pushed back his fedora hat, with its major's leaf pinned on the front of the round, uncreased crown; it was the only relic of civilian life on the island.

"I don't want anyone wandering around chasing Japs tomorrow," he warned, "so leave the camp areas alone." He joined in the grin that spread around the circle of faces. He referred to an incident which had given the Air Forces its biggest laugh to date. The incident occurred during a strafing raid not unlike the one they were now preparing for. One of the fighter pilots had caught a Jap with his pants down—literally. Winged in low over the camp area on Kiska, he found himself bearing down directly in the path of a Jap dashing half-dressed from a tent and running for more solid cover. The pilot got to laughing so hard at the little figure with the huge strides that he almost forgot to pull the trigger.

"Now for those who weren't over this morning," the Major continued, "the anti-aircraft guns haven't been firing when we come at them. The Japs have been keeping their heads below the revetments until we get past 'em and then popping up to shoot as we're going away. The wing men have got to watch that. When they pop up to fire at the lead plane, the wing man has got to knock 'em down again.

"Joe, you follow me in. We'll go in over the south side of the harbor, circle around and duck out over that ridge just before we get to the head on the north side. We'll circle off shore until the bombers have dropped everything, but don't get away.

"Chuck, your flight will go in over the north head and swing around to come out toward the southwest. Tom and Bill, I want you to be top cover and stick pretty close to the photographic plane. One of those Zeros might get too close. Red, your flight goes straight in for those ships in the harbor. The bombers say the most accurate anti-aircraft fire is coming from that destroyer and that other ship you'll find near it. Come in low, deck level or lower if you can. The Japs can't get those guns of theirs down very well.

"Mac, you're to spend all your time looking for submarine nets. I don't care if you don't fire a shot. Don't, unless someone shoots at you. You fellows with the P-40s will go with a bomber that's to look over Gertrude Cove on the south side of Kiska. Somebody thought they saw a couple of subs in there this morning. If you don't find anything, you can come over and join us. There's a little valley that runs from Gertrude Cove almost over to the harbor, but be careful you don't get tangled up with us. You'd better wait until the bombers have finished and you'll only have Joe and me to watch out for in case we have to come back for another shot at those float planes just north of the dummies. Any questions now?"

"What time do we take off?"

"Who's going?"

The Major pulled out his notebook again and read off a list of names.

"The rest of you will get to go in the afternoon if the weather holds out," he said. "Takeoff will be at 7:15. Be there at a quarter of seven. You can get chow starting at a quarter of six. Any of you that haven't got alarm clocks be sure to tell the sergeant so he can wake you in plenty of time. Now get a good night's sleep."

Next morning, back in the headquarters hut of Brigadier General William O. Butler, commanding general of the Air Force, a little group of officers and enlisted men sat huddled around the radio. On schedule to the minute, they could hear the rasping voices of their fighter pilots, punctured with static, as the pea-shooters dove down over their targets at Kiska.

"Look out, Bill, there's one above you."

"Take that one, Ed, I'll cover."

They drew closer to the radio to try to make out the voices. It didn't take much

imagination to picture the hurricane of fire being loosed by the .30s, the .50s and the 37 mm. cannon from the pea-shooters. Then came sharp commands over the radio as the bombers swung into action. A few minutes of breathless, unseemly action and then out of a welter of calls, answers and hurried warnings a strange voice was heard clearly.

"Where you going now, Eddie?"

The Jap radio operator on Kiska even had the name right as he tried to draw out the raiders' next move.

There was a fraction of a second of relative silence; then came the answer in an unmistakable Texas clenched-teeth drawl that not even a throat mike could hide.

"None of your goddam business, you Jap ———! I'll blow your radio shack off that damned island."

A torrent of profanity drowned out the static and fairly made the little table radio at headquarters writhe. The General pushed back his chair and threw up his hands. "I thought I knew some cuss words," he muttered.

Then came the Jap voice again, a little less well disguised this time in the heat of the excitement.

"Come back here, you American ———. You die."

"We'll come back, don't you worry. With more bombs, you ———."

Then a sharp call for the PBY rescue ship. The call brought the little group to the edge of their chairs.

"P-39 down just west of Little Kiska," it said.

The group around the radio exchanged glances. That would be almost in the mouth of the harbor.

"Drop a life raft, somebody," they heard next. Then:

"Where is it? Where is it? Can't see it from here."

THE group around the radio at headquarters discussed the chances of the fallen fighter pilot as the planes returned from the raid.

All the B-24s returned; all the pea-shooters but one came back. In little knots along the runway the crews talked excitedly.

"I saw him get out of his ship," said a pilot. "He was floating on his back waving me on but I don't know whether the PBY found him or not. It was pretty close to those guns of Little Kiska."

"Maybe the Japs picked him up," added another. "He came down just outside the harbor."

Lieutenant A. T. Rice, who got two of the five Jap float planes bagged that day, swore softly to himself. "I'd trade the two I got in a minute for the one that knocked him down," he said.

The ground crews were swarming over the pea-shooters, removing empty ammunition belts, checking motors and surveying the bullet holes in wings and fuselage.

"Hey, Sarge, I need a new aileron." A tall, rangy pilot who looked as though he never would be able to fold himself into

the cockpit of a P-39, wiggled the left aileron, half shot away by an enemy anti-aircraft shell. "Here's something for the scrap metal collection, Sarge, but the controls worked OK all the way home."

Another pursuit pilot turned over in his fingers a bullet he had fished out of the ammunition compartment in front of the cockpit and whistled softly to himself, "I wonder where that one came from." A slap on the back jarred him.

"Well, Jack, I'll tell you. It came from the late Tom Tojo, or maybe he was Sam Saki, pilot of one Zero float plane just fresh deceased. He's now fish food in Kiska harbor, thanks to your very fine work as a decoy."

"Decoy, hell. I never even saw him. All I saw was tracer bullets whizzing by both sides of the cockpit and I sure pulled in my elbows. Where did he come from?"

His companion shrugged his shoulders. "Search me. All of a sudden he just appeared out of the nowhere into the here, as my Dad used to say to me. He flew right into my sights, practically. One burst did it."

Jack gulped ever so slightly. "Thanks, Pal, I owe you three beers. Those Zeros sure can climb like hell and turn on a dime, but I wouldn't trade this old battlewagon for one of them." He counted an even dozen bullet holes in the wings and fuselage. "Those Zeros can't take it."

On the other side of the landing strip the bomber crews were stretching their legs and sticking their fingers curiously into bullet holes. In one B-24, just above the side gunners' port, there was a hole about the size of a porterhouse steak, the jagged edges curving outward. An ambulance rolled to a stop beside the plane and a leather clad figure slid slowly to the ground from the rear floor hatch. He was holding a bloody rag to his mouth. Two stretcher bearers quickly grabbed him by the arms and placed him on the stretcher.

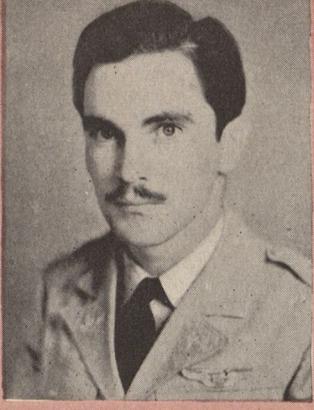
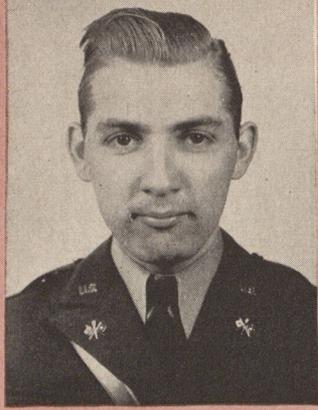
The tail gunner stuck his head out of the side port. "Skippy's all right, fellows, all the Japs got was his moustache. He can grow another one in six months."

As the stretcher was being lifted into the ambulance, the top turret gunner rushed up.

"Say, Skip, I got that guy. He came up from below shooting into the bomb bay as soon as the doors were opened and was too low for me to get at, but when he climbed around to get on our tail I gave him hell. Have you ever pulled both barrels on a partridge? All you can see is feathers. That Zero got everything I had left, almost 300 rounds, and all you could see was feathers."

So it goes with the Air Force in the Aleutians, day in, day out, in fair weather sometimes, but mostly foul, with no one able to tell from one hour to the next what the weather will be. During the winter months the gale comes in at 100 miles an hour or more, and sometimes it lasts for days.

Not long ago the boys were suggesting that a 500-pound bomb be rigged as a wind sock.



ROLL of HONOR

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PURPLE HEART

COLONEL: Newton Longfellow. **MAJOR:** Paul W. Tibbets, Jr. **CAPTAIN:** Kermit Messerschmitt. **LIEUTENANTS:** Irving Berman*, Charles Chuteridge, Edwin Cihak, Francis Cornwell*, James P. Ferry, Roy Gallaway, Charles B. Guthridge, Maurice Horgan, Arnold Johnson, Eugene M. Lockhart, Frederick A. Loehr*, Joseph P. Moore, Winfield E. McIntyre, Jr., Russell O. McKray, Joseph D. Nave*. **MASTER SERGEANT:** Fred Peoples*. **STAFF SERGEANTS:** William A. Adams, Eugene Davis, John M. Hughes, William W. Schimke, William J. Watson*. **TECHNICAL SERGEANT:** Harry M. Hayes. **SERGEANTS:** Jack E. Falatic, Kenneth R. Gundling, Herman S. Hagg, Harry O. Hill, Farris M. Humphries, Julius L. Kleiman*, Raymond Mayo, Ralph E. Mouser, Orval V. Paul*, Robert F. Price, Frederick J. Rich.

*Posthumous

DISTINGUISHED FLYING CROSS

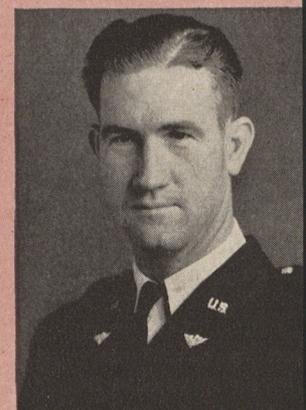
COLONELS: Truman H. Landon, Arthur W. Meehan, Roger M. Ramey. **LIEUTENANT COLONELS:** Richard H. Carmichael (Also Silver Star), Loren B. Hill-singer (Also Purple Heart), Russell Waldron. **MAJORS:** Jack W. Berry, Paul C. Davis, Marion N. Pharr. **CAPTAINS:** Harry N. Brandon, John Daugherty, Thomas F. Mansfield*, David C. Rawls (Also Silver Star), Harold G. Slingsby, Jack F. Todd*, Warren Wilkinson. **LIEUTENANTS:** Milton C. Barnard, Frank R. Beadle, Roy R. Bright, Barrie Charles Burnside, Carroll J. Cain, John Jarvis Cape, Jr.*, Lester M. Chester, James Alexander Dale, Myron J. Grimes, Harold P. Hensley, Samuel Junkin, Jr. (Also Purple Heart), Paul M. Lindsey, Clarence W. Lipsky, Morris E. Mansell, Jr., Kenneth W. Northamer, Benjamin Pashall, 3d, Levon L. Ray, Hubert P. Sage, 2d, Robert O. Scheible. **STAFF SERGEANTS:** Roy T. Halley, James C. Simmons (Also Purple Heart). **TECHNICAL SERGEANT:** Kirby W. Neal. **SERGEANTS:** Christy A. Faith, Gilbert C. Goar (Also Purple Heart), Zackie T. Gowan, Adam R. Jenkins, Jr., William E. McIntosh, Roy T. Nalley, Felix A. Trice, Rudolph Turansky. **PRIVATE:** Joseph M. Walsh.

SOLDIERS MEDAL

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AIR MEDAL

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From top to bottom: Captain Charles R. Fairlamb, Lieut. Kenneth W. Northamer, Major Robert A. Ping, Major G. E. Glober, Major Frank Sharp, Captain Jack E. Caldwell, Major General Ira C. Eaker and Captain Marshall A. Elkins.

The distaff side is fighting too—shoulder to shoulder with men workers in air depots and offices throughout the nation.

ALMOST everyone knows about the WAFS—the first women fliers in the history of the Army Air Forces. The announcement that 50 civilian pilots would form the Women's Auxiliary Ferrying Squadron to deliver training and liaison craft from factory to field has aroused nation-wide interest. And justifiably so.

But not so well known is the fact that for every woman flying an Army plane, more than 1,000 women are serving the Air Forces on the ground. That means a civilian army of some 55,000 women behind the men behind the planes.

Personnel officers tell us it is only the beginning. The Technical Training Command, for instance, is planning for the day when 40 percent of all its civilian employees will be women. The Air Service Command estimates that in the future 75-80 percent of the civilian employees in its supply departments, 50 percent in its engineering departments and 80 percent at its Headquarters eventually will be women.

At our huge air depots and busy sub-depots former waitresses, now slack-clad and goggled, puncture sheets of metal with powerful electric drills; beauty operators have traded hair-curling gadgets for flaming acetylene torches; co-eds drive "elephant" trains; mothers who not long ago were darning Junior's socks now stitch fabric wing surfaces and pack parachutes; salesgirls and housewives in fume-filled rooms spray paint on fuselages; school teachers operate bandsaws on precision woodwork tasks; high school graduates in their first jobs hammer sheets of tin into ribs, and clean and repair generator cables.

Women dispatchers direct planes in and out of McClellan Field, California. Women teach parachute rigging and teletype operation to the men of Chanute Field, Illinois. Women train as grease-monkeys at Maxwell Field, Alabama. Women study to become radio instructors at Scott Field, Illinois. Women operate printing machines at Duncan Field, Texas. Women repair aircraft radios at Hill Field, Utah. Women serve as dental hygienists at the Santa Ana Air Base. Women train at Bowman Field, Kentucky, and Randolph Field, Texas, as doctors' assistants for actual flight duty in aerial ambulances. Women have taken over the parachute department at Langley Field, Virginia. Women dash about Keesler Field, Mississippi, as messengers on motor scooters and bicycles. Women drive trucks, staff cars, and jeeps at dozens of airfields.

As Air Force procurement inspectors at several aircraft plants, women check the work of other women employees to see that



WOMEN in the Air Forces

By Charlotte Knight

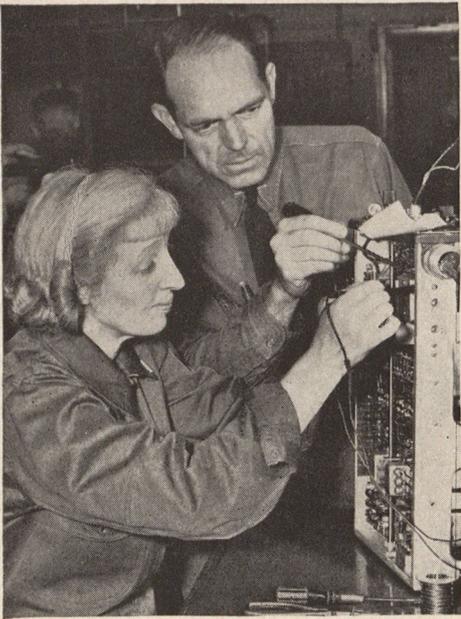
it meets rigid government requirements. Women cartographers and geological survey draftswomen do highly detailed map work. Others serve as meteorologists and weather clerks. At Wright Field's enormous Materiel Center, women work as metallurgists, physicists, aeronautical engineers, chemists, statisticians and economists. As laboratory technicians, they develop pictures in photographic darkrooms, test and analyze materials, conduct experiments with glass and plastics.

Thousands more sit behind typewriters, business machines, telephone switchboards and teletype machines at nearly every Air Force field and station in the country. Camp

librarians, service club hostesses, auditors, clerks, bookkeepers. Day-laborers, gardeners, janitors, laundresses, cooks. "Jills of all trades" keeping 'em flying—quietly, efficiently and without fanfare.

A few months ago fliers were astonished to be met by women driving tugs, and grease-smearing ladies in slacks clambering on their planes and taking over. But they are getting more and more accustomed to shouting: "Hey, lady, how's about gassing up and checking the tail wheel?"

The first all-woman aircraft maintenance crew took over a damaged multi-motored plane recently at Ellington Field, Texas. Other fields are following suit. Girl gradu-



Mrs. Pauline Brooks brings patience and skill to her radio repair work.



Miss Virginia Cabell is one of many thousands who work in war offices.



A neat spot welding job is handled professionally by Miss Jeanne Brady. Below, Miss Jackie Hoschall speeds important war messages on their way.



ates of a Texas aircraft school proved to be such capable mechanics that their flying school bosses at Lubbock Field are looking for more like them. Maxwell Field opened the Air Forces' first aircraft school for women last spring. The school now turns out experienced workers who can take a smudge on the chin and like it.

At the Ogden Air Depot at Hill Field, Utah, which serves as supply, repair and maintenance station for the mountain states, you will find more than 2,000 women at work and another thousand in training. You'll see middle-aged women, their faces visible behind plexiglas masks, operating lathes and milling machines, repairing and making parts for the planes their sons are flying. Many of the younger ones get someone to look after the children while they take their places in the aircraft electricity shop, the cloth-cutting rooms and the engineering section. Scores of school teachers from the Rocky Mountain States used their summer vacations to work as classified laborers; some are staying on. You'll see them nailing cases shut, sorting and packing warehouse supplies and keeping hundreds of thousands of machine parts in order as supply clerks and stock tracers.

With few variations, it's the same story at any big Air Force supply station. At McClellan Field women water the acres of green lawns that surround the depot buildings, operate electric mowing machines, and trim the tall evergreen shrubs which give the place a country-estate appearance that belies the activity inside. Between the warehouses, you see girls—"stock chasers," they call them—collecting and delivering supplies from one part of the field to another with small tractors. Out on the runways, other women sit atop tugs, with flag markers in their hands, guiding a plane to its parking space. When the pilot leaves his ship and enters the operations office he is checked in by one of four girls who have the distinction of being the first full crew of

women airplane dispatchers in the Nation.

"We're using women dispatchers as guinea pigs," their supervisor explains. "We couldn't get trained men of non-draft status so we decided to try out the girls on a very tough assignment to see if they could take it. They can. We selected these girls from dozens who came in when we sent out the call. We required that they have a good educational background and know how to study, be 25 or under, have emotional stability, better than average tact and an excellent memory. After all, it's up to them to get these planes in and get 'em out again. That's a pretty tall order but these girls have certainly measured up to it, and the results of our experiments should prove to others that women can do the job." Three of the girls are college graduates. One was a school teacher. The fourth is the wife of an Air Forces flier who is on combat duty overseas.

THE foreman in the woodwork section at McClellan points out a diminutive brunette as a typical woman worker under his supervision. "For weeks she spent an extra three hours a night in classes, in addition to working her regular eight hours," he comments. "She is painstaking, capable and ambitious. She's had three raises in the few months she's been working here and now is making about \$1,800 a year."

The girl in question is absorbed in an intricate wood pattern, but stops her machine to answer a question. "Dull? Heavens no. This is the most fascinating job I ever had." She points to the blueprint before her. "You see, we are given one of these, and then we just go ahead and make up whatever it says. I really don't know what part of the plane I'm making. But it can't become boring, because as soon as I finish this they give me another blueprint and I start all over from scratch. The toughest part of it was getting used to reading blueprints,

but once you get on to it, it's fun." Here's how a goggled, red-haired, 32-year-old welder at the same field sums up her job: "Whoever said this was a routine job didn't know what he was talking about. I've been a saleswoman, worked in stores and offices and done all sorts of white-collar jobs, but I'll take this any day. I'd like this type of work after the war. The men in this section treat me just like one of the gang and that's what I want."

The blonde working with an electric drill nearby happens to be the national women's pistol champion. In her off-duty hours she organized an auxiliary police squad made up of several women at the field and has taught them the finer points of target shooting.

In a large, sun-lit room upstairs several women sit on high stools bending over flight instruments. With a patience which some women are credited with possessing to a greater degree than men, these girls make repairs and adjustments on delicate pressure and balance instruments requiring 100 percent precision operation. Ticklish work, this. Very little talking goes on in this room; wholesale concentrating doesn't permit it.

In one corner, with a half dozen tiny tools spread before her, a serious young woman is adjusting a bank and turn indicator. She is not to be disturbed. At another bench a woman in her mid-thirties reveals that she sold orthopedic supplies before joining the Air Forces. At the moment she is assembling parts that make up flight goggles and packing them in small containers.

"We have thousands of pairs of goggles to pack and we try to do as many as we can between repair jobs," she comments. "Every once in a while, just for fun, I slip a little note into the box before I close it. Somehow it makes me feel closer to the boys who'll be wearing those goggles. . . What do I write? Oh, I just wish them luck, that's all."

IN the optical section, women work on cameras and camera guns. Several of them in the darkroom have taken men's places as laboratory technicians. They develop and enlarge sections of mosaic negatives from an aerial observer's camera and later piece them together to form a large-scale view which sometimes covers an entire wall. This is not as simple as it sounds and getting these various pieces of an unknown aerial view to fit into a glorified jig-saw puzzle requires considerable skill. The girls have been doing the work for several months now and are as expert at it as the men. "I have a boy-friend in the Air Forces," one of them explains, "and I wanted a job that had to do with flying. This fills the bill."

At Duncan Field, at Sheppard, Patterson, Langley, Will Rogers, the Spokane Air Depot and at several other large stations you find women comprising from 30 to 50 percent of the mechanic-learner classes, and the figure will probably rise sharply in the next few months to meet the increased demands imposed upon the aircraft maintenance division of an air force stepped up

to 2,000,000 men. By the end of the year, it is estimated that 50 to 75 percent of the civilians in technical and mechanical positions at these depots will be women. This calls for an extensive training program, now under way in every part of the country. Women who left peacetime jobs, usually in fields widely divorced from the mechanical, are given aptitude tests to determine their skills in metal and fabric work and instrument repairing. Occasionally, classes are conducted right in the shops of the field itself, but

Our Women Pilots

THERE'S no time for glamour in the Women's Auxiliary Ferrying Squadron. The first contingent recently completed a tough, four-weeks' Army-conducted refresher course at the New Castle Army Air Base near Wilmington, Delaware, and are now ready to ferry light planes from plants to Air Force fields.

Women who want to fly with the WAFS must meet the same rigid requirements as regular civilian ferry pilots. They must have 500 hours flying time, cross-country experience, a commercial license of 200 hp. rating, high school education, American citizenship and must be between 21 and 35 years of age. They'll keep their civilian status and will be paid \$3,000 a year.

Heading the organization is Mrs. Nancy Harkness Love, 28 year-old pilot who has been flying for 12 years and has 1,200 hours to her credit. Miss Jacqueline Cochran, as director of women's flying training for the Army Air Forces, will train women in cross-country flying as part of a program to create a pool of trained women pilots from which the WAFS can draw to meet future needs.

more often in nearby cities. The average class lasts about three months. During this time, the students are paid \$75 a month, the same as aviation cadets. With the exception of Maxwell Field's school exclusively for women mechanics, most of these classes are co-educational.

The women spend 40 hours a week in classes and in the shops. During two weeks of initial basic training, they are taught the background work they'll need in repairing and taxiing planes. Then they are divided up for specialized training in airplane engine mechanics and sheet-metal work. Instructors have found women apt pupils and willing workers. They are put to work on virtually all jobs except final engine installation and landing gear assembly. Hundreds of depot graduates, who agree to go anywhere in the country, are sent to other fields and sub-depots. Currently, the National

Youth Administration also is conducting preliminary courses in aviation mechanics for girls between 17 and 25 at many State centers near large depots. They are paid \$10.80 a month plus room and board for four months. After that, most of them are sent to the nearest Air Service Command installation for further training.

An urgent need of the moment is for women radio instructors. They are needed to teach radio operation, radio repair and radio code to enlisted men of the Air Forces Technical Training Command. Many are in training; hundreds more can be used. If they have had previous radio training, or possess a commercial or amateur radio operator's license, they can qualify for a student-instructor's rating. They are sent to Scott Field, the parent radio school of the Army Air Forces, for a three months' intensive course under experienced civilian and Army instructors. They receive \$135 a month while training and on graduation are appointed junior instructors at \$2,000 a year. Women with more extensive radio experience can qualify for other instructorships at \$2,600 and \$3,200. It's not an easy life. These women instructors put in seven hours a day, six days a week, on an early shift that begins at the crack of dawn or a late one that doesn't end until 10:30 at night.

IN the field of meteorology several girls already are working for the Directorate of Weather as "junior scientific aides," compiling weather maps, doing cryptanalytic work, engaging in research on oceanography or making climatological studies.

Hundreds of these women workers left comfortable homes to live in over-crowded rooms, vacant school buildings, dormitories or any place they can find, frequently in towns and cities from 5 to 75 miles away from installations where they are employed. Many fields have set up government trailer camps adjacent to the reservation pending completion of housing projects. Hill Field has 300 units in its "trailer town," all of them limited to married depot workers and their families. At Wendover Field, Utah, the housing problem for girls employed at the field was so acute the Army gave single girls permission to rent trailers. Two girls live in each trailer and pay \$6 a week rent. They are clean and adequately furnished with a double studio couch, table, chairs, cupboards and kitchenette with running water. Bathing facilities are located in community buildings; water is anything but plentiful and its use is often limited.

Girls less fortunate than those living in trailers at Wendover have had to rent small, crowded frame motor-court type "houses" for rents of \$60 to \$80 a month. At present there is practically no recreation for these women when the day's work is over, and the nearest town of any size is 140 miles away. But you'll hear no word of protest. They like to watch the huge four-motored bombers fly overhead and know that they have had something to do with the bombers' being there.

SQUARE PEGS

(Continued from Page 9)



Booby Traps!

A GERMAN plane brought down over Malta was equipped with a new type of radio. When the British attempted to remove the radio, an explosion killed five men.

A Nazi officer in captured Sevastopol turned on a water faucet in his new headquarters. An explosion ripped out the entire floor.

A British Commando on a raid across the channel kicked open the door of what seemed to be a peasant's home. The entire house blew up.

In each case "booby traps" were responsible. A "booby trap", so named for obvious reasons, is any form of concealed mechanism designed to be set off inadvertently by the enemy or worked automatically by means of a time device. "Booby traps" rely on surprise for their success. Hence, the operating mechanism is either covered or made to resemble some harmless object.

A German whistle was found lying on the floor of an officer's quarters. When the whistle was blown, the vibrating pea hit a striker which caused an explosion. When the British captured Agedabia in Africa, the entire town was mined with both anti-tank and armor-piercing explosives.

In the midst of these contrivances, "booby traps" were found under many

guises. Innocent looking tar barrels had been left along the road. In them were found three large shells rigged to explode by electricity. Behind the doors of most of the houses in Cyrenaica, the British discovered wires which were attached to hand grenades. They exploded when the doors were opened.

A favorite "booby trap" of the Germans is the stick grenade. These grenades are left lying around, seemingly a part of captured booty. When an attempt is made to use them against their former owners, the grenades explode immediately without the usual delay of a few seconds.

Traps usually are set in groups in order to reduce the chances of complete discovery. A detected trap is a tip-off that more will be found in the vicinity. Very often an obvious trap is used to mask a well-concealed one nearby. Suspicious signs denoting the existence of "booby traps" include the presence of pegs, nails and pieces of wire or cord for which there is no apparent use, traces of camouflage and withered vegetation indicating some attempt at concealment, indications that an area has been carefully avoided and irregular footprints or wheeled traffic marks for which there is no apparent reason.

What can be done to avoid these death traps? If at all possible personnel of the Engineer Corps should inspect all materiel in newly occupied territory. Engineers are fully trained to locate "booby traps" and well equipped to spring them harmlessly. If engineer personnel is not available, the use of extreme caution and good common sense will go a long way in protecting you from injury. Before entering a house formerly occupied by the enemy, get behind some protection and use a long pole to push open the door. Carefully inspect every object in the house to determine if hidden wires are attached. Don't move any furniture unless necessary. Act on the assumption that every object left by the enemy is a potential "booby trap" and treat it accordingly. If you find anything that looks suspicious, mark it well so that other personnel will recognize the danger zone.

Maxwell Field, when the Pearl Harbor episode took place. Since then, the motto in psychology, as in many other fields, has been "go as fast as you can with what you have."

"What you have" leaves a lot to be desired. Many testing instruments, for instance, require specially-built, delicate timing clocks. At present, it is hard to buy a stop watch. But rapid progress has been made and by now several of the early devices have been replaced by shiny new models carefully designed and engineered to meet the exacting requirements of the research specialists.

Only the ingenuity of the department has enabled it to keep up with the wartime pace. Priorities were hard to get. Commercial orders, when they did arrive, were often inaccurate and useless. A commercial peg board of the type used in factory aptitude tests, for instance, arrived impossibly warped. The psychologists turned carpenters, built their own peg board set to the desired 1,000th of an inch accuracy.

A "sway test" to measure balance and fear of height was rigged up from scrap metal parts taken from the wrecked airplane "graveyard" at Maxwell. Styluses used in the steadiness test were made from ordinary pencils with straightened paper clips substituted for lead.

The use of practical psychology to predetermine the probable success or failure of fliers is not new. Edward L. Thorndike, Professor of Psychology at Columbia University, did extensive work along this line in the first World War. Some tests were developed as the result of his research, but in the post-war clamor for disarmament, the program was dropped.

Now many of the best known psychologists in the country are back on the job. In charge of the Nashville Classification Center, for example, is Major Laurance F. Shaffer, former professor of psychology at Carnegie Tech. Assisting him are men like Captain Frederick Wickert, who received his Ph. D. Degree from the University of Chicago and worked in aptitude testing with Western Electric Company; Captain Lewis B. Ward, Ph. D. from Yale and former clinical worker in this field; Captain Neal E. Miller, former associate professor of psychology at Yale and author of several volumes on the subject, and Lieutenant Frank H. Boring, son of Professor Edwin Boring, director of the psychological laboratory at Harvard University. Most of the enlisted men in the section have M.A. degrees; some have Ph.D's.

The profession which was called upon in the last war to handle the vital, though negative, task of eliminating mental incompetents, now finds its niche in a positive job dealing with the brightest, quickest minds and ablest bodies in the country.

Practical psychology is thus saving the nation millions of training dollars and, more important, saving a maximum number of men for aerial combat by placing them in the right jobs.

PRELUDE TO DESERT COMBAT

(Continued from page 23)

the enemy demoralized by the fury of the air assault, the ground forces can strike home their own blow. Like the hard swinging right that follows the sharp left, the tanks deliver the knockout.

Air support of ground forces consists generally of four phases:

(1) The planned attack where the planes deliver their blow according to the schedules laid out in the combined operations tent of the advancing army.

(2) The attack delivered by the air forces when a ground commander finds himself in trouble and appeals for aid through the air support party travels with a division or a smaller task force.

(3) The "lead-in" attack where high flying, speedy pursuit-type observation planes spot a target and guide bombers summoned by radio to the mark.

(4) The supply support delivered by all types of planes in co-ordinated action.

Of all the phases of air support, probably the most spectacular, from an aerial standpoint, is the "lead-in attack." During one of the later problems of the recent desert maneuvers, this aerial blow was carried out with perfect timing.

A high flying P-43 dodging in and out among the clouds spots a column of dust marking the movement of enemy vehicles. The keen-eyed pilot is baffled by the dust and by the heat distortions. But he feels that the column moving below might be a target. He estimates the length of the column and flies far out of sight and hearing, drops from his high level and returns.

But now he is flying low. Following the contours of the ground, he approaches at an altitude of from 10 to 30 feet. Finally he bursts on the convoy from behind the screen of a low dune. Making a single pass under the protection of his own guns, he verifies the composition of the column.

Is it a target? Is there enough strength present to make it profitable for air attack?

There are tanks, half-tracks, personnel carriers, trucks and guns. Thousands of men on the move.

The pilot of the observation plane pulls away abruptly. He leaves the impression that his is merely a strafing enemy plane. But actually he has a far more deadly mission.

Away from the column he climbs once more, carefully avoiding any contact with enemy planes. Safely free of the area, he radios Air Support Headquarters. He outlines the target, reports its approximate strength, its route and apparent destination. But in the desert rapidly moving armored columns can be lost easily. He is instructed:

"Watch them. At 0945 meet bombers at . . ."

Back at the airdrome everything is in readiness for a mission. Pilots are briefed

and, after an incredibly few moments, the planes take off. Meanwhile, high in the air, keeping out of the way of the enemy aircraft, the observation pilot continues to watch the enemy column, marked by dust. He waits until the last possible moment before leaving to keep his rendezvous.

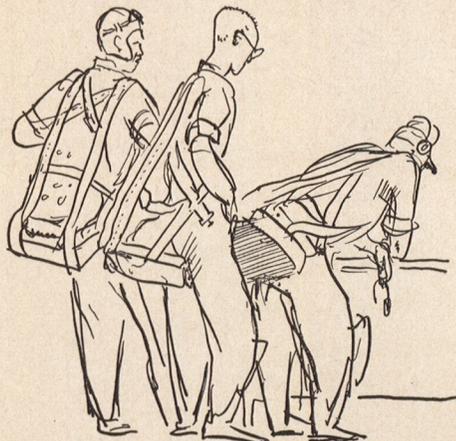
Finally he departs, meets the attack planes and guides them back. This time when he roars in at 30 feet he leads attack planes loaded with destruction. The blow is struck home hard and—the umpires decide, "bloody."

In this way the enemy can always be kept from moving by day. If he has to move at night he doesn't have the freedom of movement necessary for victory in the desert. And what makes this type of attack especially damaging is the fact that the bombers are always within radio call of Air Support Headquarters. If necessary they can be diverted to other more important targets. It keeps the planes in use, making them an always effective weapon.

ANOTHER important operation is the re-supplying of an armored battalion by air. According to one problem set up at the maneuvers, an armored battalion was locked in battle, unable to disengage. Ammunition was running low. Gasoline supplies were fast vanishing. Water and rations were needed.

Over his radio net the ground commander asks for supplies. An air support party with a combat command of an armored division picks up the request, passes it on back to support command headquarters. There, after conferences with Ground Forces, G-3, the decision is made. The battalion will not be sacrificed. It will be supplied by air!

At the airdrome where the big transports are based, a ground supply officer makes up the stores needed to keep the battalion going: one fire unit of ammunition, a day's ration of food and water and gasoline and oil for the tanks and half tracks. The supplies are attached to different colored parachutes designed to aid the ground commander in picking up the most necessary items.



Ammunition goes on chutes of one color, water and rations on another, gasoline and oil on a third. While ground men load the big planes, support command headquarters co-ordinates the operation. Pursuit ships must meet the transports and escort them safely to the scene. Low level bombers are on hand to blast out enemy ack-ack and, then, after the chutes are lowered, to sweep across and keep enemy heads down while the supplies are picked up.

BY NOW the planes are in the air and the ground commander knows that help is coming. He has drawn up his vehicles in a huge oval. The guns of the battalion are all trained outward. He has his panels out indicating the direction of the wind and the path along which he wishes the transports to drop his supplies.

The bombers come over, then the transports, swinging in at 400 feet. From the opened doors come the chutes. They fall in clusters, mostly within the bivouac. The chutes that fall outside are retrieved by tanks which move forward, guns blazing. Men slide from the hatches and double quick their way to the ammunition chutes, dragging them back to the covering tank. Later they will pick up the water, food and gasoline. But first they want the where-withal to fight.

The attack bombers have kept the enemy down while the ammunition chutes are retrieved. The ammunition is issued and the enemy is driven back sufficiently to permit gassing and distribution of the food and water.

Also, during the maneuver, an "air-head" is established. Transport planes land 100 tons of supplies at an improvised airdrome in the desert flats in an hour and a half. Operations such as this explain the Nazi success in Libya. Our own Army ground-air team is mastering the task.

Excessive temperatures and the constant gritty sand flying about have created a maintenance problem comparable to that experienced in Libya. And competent authorities say that the American desert, on the average, is ten degrees hotter than Egypt.

"Simplest and most important of all the maintenance dodges," Colonel Lee explained, "was one that entailed a little education. We had to teach the pilots to stay out of each other's prop wash. When they get in the wash the intakes fill up with sand. Simple enough, but very important."

There are many other important technical phases of maintenance. But most of them are secret, pertaining to our own equipment. But Colonel Lee remarked:

"Our planes—the ships we've been using out here have stood up very well. We couldn't ask much more than what we're getting in the way of performance."

A mechanic working under lights at night was philosophical. Said he:

"Gotta keep 'em flying. We frequently work all night. But it's worth it to see these babies take off in the dawn ready for anything."

AIR FORCE, December, 1942

The author, in his flying radio studio.

You Can't Ride the Beam IN COMBAT

Air war in the South Pacific through the eyes of a fighting radioman who was there from the start.



By Aviation Cadet Robert D. Gibson

WE FLEW against the Japs over Bali and Java. They chased us out of Singapore. We ran into them again flying ammunition from Northern Australia to Port Moresby. We were always outnumbered in those early days of the war and, all in all, we took quite a licking. But even then we were sure the Jap Air Force would get a good drubbing before it was over.

My job was radio operator. And I know first hand that a radio operator is a mighty important man on every combat mission. If that sounds like bragging it isn't meant to be. I don't mean just me: I mean every radio operator. And I can show you what I mean.

But that's getting ahead of my story—about seven months ahead to be exact. Back in November, 1941, we left the United States on what was to have been a three-week survey trip of the Ferry Command's southern route to Africa. Seven months and 696 hours of flying time later we arrived back in the United States by boat from Australia. Meanwhile, we had been in Egypt, India, Singapore, New Guinea, Australia, Burma, Java and Bali.

We were in Egypt when we first heard of the outbreak of war. Instructions came through to pick up Lieutenant General Brett in Cairo and take him where he wanted to go. And the only places he wanted to go were where the fighting was the thickest. Before I got into the Army I used to think that Generals stayed a comfortable distance away from the actual fighting. But after being with General Brett, I changed my mind. He is the "goingest" man I've ever met.

We took the General to India and then to Australia where he left us and we went on to Java. That's where the going really got tough. It's always tough taking a beat-

ing. But for the number of planes we had down there, we did a lot of agitating.

As radio operator (I was a Technical Sergeant at the time), it was my complete responsibility to guide our plane in and out of the combat zones. The Dutch and British who were operating the anti-aircraft guns had very itchy fingers. If the radio man didn't send in the right recognition signals at the right time, he and his crew would probably be cited for valor, but posthumously. Some of the time, particularly when flying ammunition from Australia to Port Moresby, we flew without a navigator so we could get the maximum amount of cargo into the plane. It isn't cheerful flying without a navigator, but sometimes you just have to do it. And with air raids occurring very often, it was up to the radio man to determine whether we would be coming in under a bombardment.

THERE were three signals we paid special attention to. One was QQW which meant that the sending station was having an air raid alert. The second was a QQQ which indicated that an air raid was in progress. And the most looked for was the QQZ, or "all clear." If the radio man wasn't on the beam all the time, he would be bringing his plane into his station with anti-aircraft firing at him from beneath and Jap bombers greeting him from above.

Even with all our preparation and the constant watching of our assigned frequency, we got into a lot of trouble. I remember when we were trying to get from Rangoon, Burma, to Bandoeng, Java. We told Batavia that we were on our way to Bandoeng. But when we got over Bandoeng

we were met with some of the most terrific ack-ack fire we had ever experienced. Bandoeng didn't have a radio, no one had told them we were coming, they had never seen a B-24, and they just weren't taking any chances. They let us have it. The only thing we could do was turn around and go back to Singapore. But that meant danger and it would probably have meant the end of us if I hadn't been lucky enough to have picked up Singapore's radio frequency before we left Rangoon. Actually, there was no official reason why I should have known Singapore's frequency but I had found out long before that you can't know too much when you're in the combat zone. Without those signals, Singapore would have brought us down so fast it wouldn't have been funny. Any unidentified plane, no matter what its insignia, was fair bait.

But to get back to the Japs and the reasons why we think we can take them. First of all, about the much talked about Jap Zero planes. I'd be a fool to say that they aren't any good—they gave us too much trouble for that. They climb at a terrific rate of speed and maneuver with precision. But a couple of bursts and they fall apart. . . . The Jap plane makers apparently don't have too much regard for their pilots. They were giving them practically no protection and very little fire power. The boys in the later model B-17s don't bother much about the Zeros. What's more, the Zeros don't mess around the 17s. Those Japs look mighty good when they have you outnumbered, but when you are strong enough to fight they often run like hell.

Once over Java we were flying a heavily armored LB-30. Fifteen Japs came down on

us and our gunners opened up. All but three of them left in a hurry, and those didn't hang around very long. The Japs seem to like being heroes but they don't like getting bullets tossed at them.

The Zeros I saw were not particularly fast. One time in an unarmed B-24 on the way to Rangoon, we saw three Zeros about five miles away. Major Paul F. Davis, for my money the hottest pilot in the Far East, pushed the plane down to tree-top level and we started running. They chased us for 50 miles and were still five miles away.

Up in the high altitudes, around 30,000, the Zeros don't have enough soup to make more than two passes at you. They don't like to dive because it's tough pulling their flimsy planes out.

Over Bali one bright morning, a lot of Japs jumped one of our ships out of the sun. Just as one of them came in on their rear gunner, his gun jammed. So he fired his flare gun right in the Jap's face. They never saw one guy get out of a place in such a hurry as that Jap did. On another occasion, the blankets they had piled in back of the ship accidentally caught on fire right in the middle of a fight. They tossed the burning blankets out of the ship and the Japs high-tailed it for home. They must have thought we had a new kind of secret weapon.

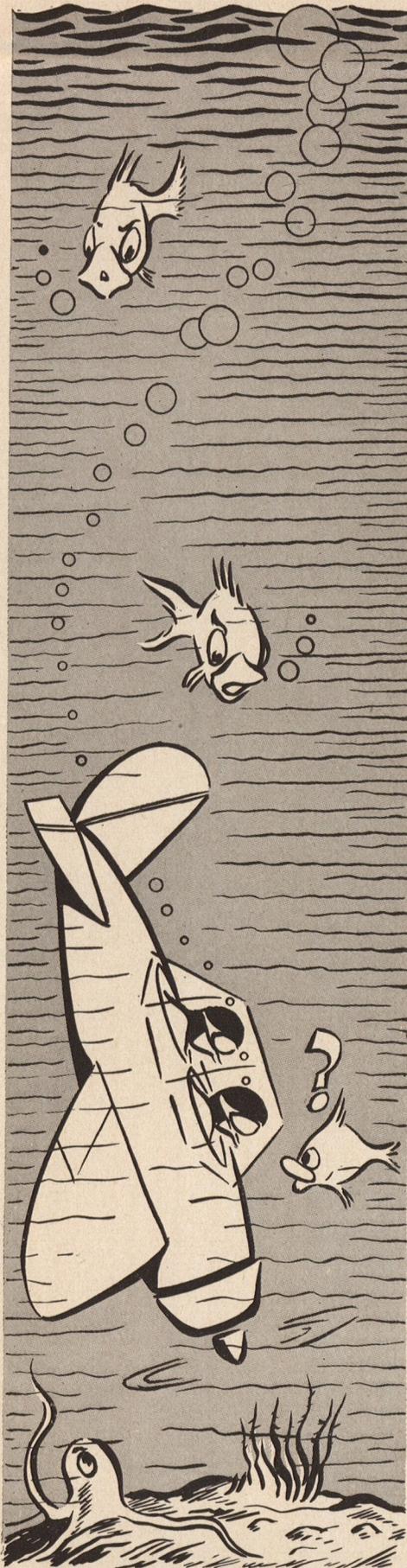
One thing the Japs could do well was strafe our planes on the ground. In the early days, communications were pretty bad and we got a lot of surprise air attacks. It was especially bad around Port Moresby. That New Guinea town is located in a sort of valley with mountains around it. The Japs would come tearing over the mountains before we had an inkling that they were around and they'd give us hell on the ground.

THE Japs did very little night bombing and their bombers seemed slow compared to our models. They invariably flew with a lot of pursuit protection. Their pursuit planes looked mighty potent from a distance—lined up and flying in smart style. But when you went in with our heavy bombers and started blasting away, it was "you take the high road and I'll get to Tokyo before you."

I don't want it to sound as if we can wipe the Japs out of the skies with two 17s and a 24. Many of the Japs are hard, fearless fighters. But when we get anything near numerical equality down there, I'll bet a ten-day furlough that they'll be easy pickings.

Does a radio operator need gunnery training? The answer is that in combat you are a gunner first and a radio operator afterwards. You can't fight this war with dots and dashes. On a tactical mission, you can't have a weak link because the Japs will find it soon enough. Gunnery means self-preservation.

Next to being able to man a gun, the most important job the radio man has to do is to pay strict and constant attention to his assigned radio frequency. This can't be



"I don't care what your altimeter says. I say it's time to pull out."

—BROOKS FIELD OBSERVER

over-emphasized. You have to glue yourself to that frequency even if there is a complete silence. And you have to take it fast. When the sending stations shoot out the information, they don't take a long time to do it. In many cases, they don't have a chance to repeat their instructions, especially when they're telling you there's an air raid in progress.

ONE day we were peacefully flying from Soerabaja to Bandoeng. The radio had been dead for a long time. Suddenly, and for no more than a second, the flash came in that they were having an air raid. We had to turn out to sea and wait for the all clear. If any radio man had let his attention wander from that frequency for just a split second, the plane would have come into Bandoeng under a Jap bombing.

Here in the States it's quite different. You can ride the beam and somebody gives you the weather reports. But in combat, you're on your own. And the more able you are to adapt yourself to all sorts of new conditions, the longer you are going to live. Every time you get in a new country, you get a new code to work with. And you have to know it cold. You can have the best damned fighting crew in the Air Forces but if you don't know your code and recognition signals, brother, you're through.

And that business about adapting yourself to new conditions is mighty important. We left early one morning to go from the Gold Coast to El Fasher, Egypt, and we didn't realize we were losing time going east. Before we got to El Fasher it was dark. I took three first-class bearings and El Fasher was completely blacked out only two miles away. They were taking bearings on us but our radio compass wasn't designed to pick up C.W. If he was shooting bearings on us, I figured, why couldn't that situation be reversed? So we turned the plane to the right and our indicator moved to the right. That showed we were going away from the station. We made a 180-degree swing back on course and came right in.

Another time, going from Australia to Port Moresby, we were given just enough gas to make the 800-mile jump in a heavily loaded B-17. It was the radio man's job to bring the plane in. If we varied from the course to any extent, our gas would run out over the ocean. In cases like that the radio man has just got to be on his toes.

Generally speaking, it's a smart idea to have your plane identification down pat. In the South Pacific, some of our planes were scaring hell out of our own boys because they looked like Zeros.

But it wasn't all work. You get your share of laughs. That day off in Darwin, for instance, when we decided to go to the movies. They showed us a James A. FitzPatrick travelogue about Bali. Filmed in peacetime, it ended with the usual—"and now with fond reluctance we take leave of the sunny isle of Bali." Fond reluctance, hell, we took leave of sunny Bali 10 minutes before an air raid.

FORCED LANDING *in the Desert*

WHEN forced down in the desert, stop and think . . . then act . . . do not become panicky.

Stay near your plane until nightfall or longer if you expect a search to be made for you. If you have been forced to resort to your parachute, make your way to the wrecked plane if it is not too far distant. Prepare some sort of signalling device such as a piece of fuselage from which the paint has been scraped or a smoke smudge from oil and waste. Whenever possible, hold rockets in readiness.

When absolutely sure that you will not be picked up, decide on a definite plan of action and follow it. Although you may have passed a camp shortly before landing, remember that you were traveling more than a hundred times as fast as you are able to walk. Remember that desert distances are deceptive, don't be fooled by mirages. Make your way toward a known route of travel, a source of water, a point from which you can signal, or an inhabited area. Do not travel during the heat of the day but only at night or in the early morning and late afternoon. Follow the easiest route possible. Avoid soft sand and rough terrain unless it is absolutely necessary to traverse it in order to follow your course. If caught in a sandstorm, put on your sun glasses, cover your nose and mouth with a piece of cloth, and get in the lee of a rock, hill, cliff or some other object.

Do not trust to instinct. Proceed only by instruments of navigation—sextant, stars and compass. Travel light, take only the bare necessities from the plane—all of the water and food, your compass and gun, first aid kit, sun glasses, a knife, matches or a flint and steel, an improvised sun helmet, and a 10-foot square piece of silk cut from your parachute. The sun glasses will protect your eyes from the sun and blowing sand; the piece of parachute silk can be used as a tent to protect you from the heat of the sun and as a shawl at night. Probably the only water that you will have is that in your canteen, so guard it carefully and use it sparingly. If your supply of water is limited, use it only to moisten the mouth and throat at infrequent intervals. — *The Air Surgeon's Office.*

HOW TO KEEP WELL

(Continued from Page 12)

Bathe whenever you can, but remember that the streams, irrigation ditches, and ponds along the coast and in the Nile delta are contaminated with the flukes that cause schistosomiasis. It is not safe to swim or even bathe in this water. However, sea bathing close to shore, where there are no sharks, and away from outlets of rivers, is safe.

You will probably want to shave, but do it in the evening to avoid sun and wind burn. The brushless, rub-in variety of shaving creams require little or no water, and serve their purpose adequately.

Troops in this area should beware of native foods and drinks, even in Cairo. The Arabs are not familiar with our habits or standards of sanitation, and take few precautions to keep themselves or their kitchens clean. Nor do they protect their food from flies, which are a particular menace. Flies live and breed in filth and transmit disease germs by contaminating food.

Fruits and vegetables almost invariably are dangerous because they are irrigated and fertilized with sewage. The safest method of preparation is to dip them in boiling water for a few minutes before peeling them. A strong solution of potassium permanganate can be used if the fruits and vegetables are allowed to soak for a minimum of four or five hours.

The best safeguard is to eat only at Army posts, even when on leave, or in European restaurants that have been inspected and approved by an American medical officer.

Milk should always be boiled, for pasteurization is not commonly employed and many of the dairy animals have tuberculosis and undulant fever.

Food spoils rapidly in this area so be sure that your lunch is made up of staple foods before going out on an operational flight. Thus, tinned foods such as fruit juices and army concentrated rations, crackers and thick-skinned fruits are preferable.

ALTHOUGH the greater part of the territory is a desert area, malaria is prevalent among the natives and should be guarded against by troops. Mosquitoes are found along the coast, river valleys, and not infrequently about oases. In an area where mosquitoes are known to abound, stay indoors as much as possible after dark. Sleep under mosquito netting at night or in a well screened building. Stay away from native towns where the infected inhabitants act as reservoirs of disease, and where many mosquitoes are usually found.

Insect repellents may be helpful but it is best to rely on such safety measures as mosquito boots, head nets and gloves if you are on night duty. Do not wear shorts or short-sleeved shirts at night when living in malaria country.

There are several other mosquito-borne diseases in the Libyan Theater including dengue fever and filariasis, for which the same precautions are applicable. Sand fly

fever is also common, and although neither it nor dengue are fatal diseases, they are capable of prostrating a large part of a command for a week or ten days.

With the exception of the upper class Egyptians, the native people have little interest in personal cleanliness. Many of them have scabies and are infested with lice. It is well to stay out of their homes, for they are frequently filthy. There is a great danger of contracting typhus fever during the winter months from associating with the individuals infested with disease carrying lice.

PROMISCUOUS women are frequently encountered, especially in Cairo and Alexandria, both as clandestine pick-ups and as professional prostitutes. The majority of these individuals have venereal diseases. Ninety percent of one group of prostitutes were found to have venereal disease, the majority having all three of the common diseases: syphilis, gonorrhoea and chancroid.

The temperature varies greatly in north central Africa. Even during the hot season nights can be so cold that blankets are necessary. The discrepancies between ground and air temperatures add an additional problem to flying personnel. Even though it is 130 degrees in the plane on the ground, temperatures in the forties and fifties or lower will be encountered at relatively low altitudes. When an over-heated and perspiring pilot passes through this degree to temperature change in a few minutes on ascending, he will become chilled and be apt to develop a cold or even pneumonia unless he is careful to arrange his flying equipment so that varying degrees of warmth can gradually be added. Excess perspiration should be wiped off prior to donning a flying suit.

Minor cuts and abrasions become infected easily and frequently develop into seriously disabling injuries, so that immediate first aid treatment of all cuts, burns, abrasions, and mosquito bites—no matter how small—should be applied. More serious injuries should receive attention as soon as possible.

The extremely hot sun during the summer months makes it difficult for one who is accustomed to the climatic conditions of the United States to evaluate the intensity of the sun's rays. Consequently, serious burns may be acquired after relatively short exposure, and the glare of the reflected light from the desert often results in serious eye irritation. This, coupled with the mechanical irritation produced by wind and blowing sand, makes it necessary for all personnel to wear protective goggles at all times, even when on land.

A thorough knowledge of the dangers you face and a determination to take all personal precautions to guard against those dangers will go a long way toward keeping you physically fit to do the job assigned you—and do it well.

Information on Desert Operations may be found in FM 31-25.—The Editor.

"WE'LL GO BACK SOME DAY..."

(Continued from Page 10)

side. I felt terrible. Then it landed and Fritz climbed out grinning. I have never been so happy in all my life."

"Landing was purely a matter of luck," her husband commented. "I had almost no control on the elevator and rudder. The only reason the tail settled after the wheels were down was that my mechanic had made a mistake that morning and trimmed the plane very tail heavy. Later we counted 300 bullet holes in the plane plus some big cannon shell holes."

On the last day of 1941 the first American B-17's from the Philippines arrived at Lieutenant Den Ouden's base in Borneo.

IN January, after the big attack on the Indies proper was launched by the Japs, Lieutenant Den Ouden's flight was officially credited with sinking four transports and a light cruiser during the landings on Tarakan. Later in the month the remnants of the Dutch East Indies Air Force—15 bombers and 16 fighters—went into action with the U. S. Army Air Forces over the Straits of Macassar.

"It was the first time we ever had fighter protection, so we felt very good," said Lieutenant Den Ouden. "On that first mission our objective looked like a fleet review—three rows of cruisers and transports—26 in all—steaming toward Balikpapan, an important oil center on the Borneo coast.

"We made our runs through the thickest anti-aircraft fire I have ever seen. Aided by our fine German-made bombsights, we hit a heavy cruiser with two 1,100-pound bombs. A heavy explosion followed. The ship was enveloped in black smoke and it toppled over in less than two minutes. Meanwhile, fighters dive bombed and strafed the transports. That was our best day. Our bombers made 12 direct hits on eight ships. We sank one heavy cruiser, one light cruiser and two transports, set afire one destroyer and damaged two large transports, one of which was beached and the other abandoned.

"We had no armor so we used sections of steel from oil drums and even the heavy base plate of electro-motors to protect our pilots and gunners. We had to play hide and seek with the Japanese planes that tried to bomb our camouflaged airdromes. Only by outguessing them did we survive.

"Japanese pilots are tricky. Often they faked attacks to draw fire from our gunners. When the gunners bent down to feed a fresh pan of cartridges into the gun, the Jap pilots would flash in to attack. We fooled them by bending down before the guns needed reloading and then catching the Zeros with a burst as they closed in.

"One Zero pilot we shot down was found in his cockpit wearing a large Japanese flag under his flying suit, wrapped around him like a sarong. An ME-109 pilot we brought down had big feet and blonde hair. He must have been a German."

By March 3 all Dutch bombers were expended and three days later Lieutenant Den Ouden left the Indies for Australia.

Lieutenant Simon reported for duty with a fighter squadron on January 26 without ever having flown a modern high-speed pursuit plane. He finished his advanced training with loaded guns over Soerabaja within range of the Japanese carrier-based Zeros. Later, his squadron of 12 Brewster Buffaloes was shifted to Bandoeng, where it formed the sole aerial defense of General Wavell's headquarters.

"In our first battle we met a sky full of Zeros right over the General's headquarters," Lieutenant Simon related. "We were caught by the top cover of Zeros as we dove to attack a group below. I remember shooting many times and being shot at. Then all of a sudden the sky was empty and I was all alone except for a few planes in the distance. I was disappointed because I didn't think we had shot down any Zeros, but the next day our ground patrols found the wrecks of five Jap planes.

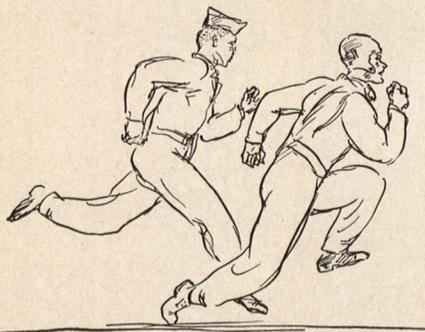
"In the battle of the Java sea we flew escort for an American dive bomber squadron—three dive bombers and 20 fighters—to attack the big Jap transport fleet. We had eight American P-40's, seven Hurricanes flown by Dutchmen and five Brewsters.

"That day we saw a sight none of us will ever forget. Below, the Japanese warships were racing around the edges of the convoy spouting flame and smoke and leaving long white plumes of spray in their wake. In the haze of the setting sun we could see the long rows of transports steaming along in perfect battle order. It was a terrible and a beautiful sight.

THE dive bombers sank one transport. When we landed we all looked at each other, everybody thinking what would have happened with 300 dive bombers instead of three. But thinking didn't help us any. We took a drink and went home.

"The next morning, with the dawn at our backs, we skimmed the water raking the landing barges along the beaches. We could see the soldiers dive over the sides as our bullets hit the barges and silenced the anti-aircraft guns in the stern of each barge.

"Within two hours after we landed from that mission, the Americans were ordered



to leave Java. Two days later we had only one fighter in shape to fly. The battle of the Indies was over for us.

"We had too few planes and what we had lacked performance. But they were sturdy and never fell apart in the air under the heaviest fire. I have seen planes land with 20-inch holes in wings and rudders, with windshield screens shot away, tires punctured and holes all through the fuselage. It was amazing. All those planes needed to be perfect was a few hundred more horsepower and additional guns."

Lieutenant Arens was a veteran KLM pilot in the Indies before he went into action against the Japs. (He is now the personal pilot of General Van Oyen.)

To keep Jap fighters away from his unarmed plane, Lieutenant Arens painted the rear of the fuselage to resemble a plexiglas gun position. He then inserted two five-foot lengths of lead pipe so they stuck out behind the tail like a pair of machine guns.

WHEN the Jap fighters steered clear of the "tail stinger" and made beam attacks, the crew of Lieutenant Arens' Lodestar poked machine guns through the cabin windows and blasted away. Three Japanese Zeros fell victim to this tactic while avoiding the lead-pipe "tail guns."

Lieutenant Arens delivered his cargoes of food, cigarettes, gasoline, ammunition and parts to bases scattered through a chain of islands that stretched one and one-half times the distance from New York to Los Angeles. When there was ammunition or gasoline aboard, Lieutenant Arens' gunners gave the tail "stinger" a fresh coat of paint.

The Lieutenant's final flight out of Java, the last from the island, was a classic. Passengers aboard his Lodestar included wives and families of high Dutch colonial officials and officers. Lieutenant Arens took off at night. As he passed over the Japanese-held airport at Palembang, he saw row on row of Japanese planes parked on what formerly was his KLM home base. In the bright moonlight the planes made a perfect target. It was three o'clock in the morning and there was no indication the Japs had even heard his plane. He couldn't resist.

Lieutenant Arens signalled his crew. Passengers were strapped in their seats with safety belts. Gunners manned the cabin windows. Lieutenant Arens poked the Lodestar's nose down toward the moonlit field. Down he went sashaying across the field to give gunners on both sides a shot at the parked planes. Inside the transport, passengers were screaming and airsick. Outside, Japanese planes burst into flames. The garrison awakened to a tardy alert.

With throttles wide open and the wheel pulled back against his chest, Lieutenant Arens lifted his Lodestar up and away, Australia bound.

"It was one time we caught the Japs asleep," Lieutenant Arens recalled. "Palembang was my home for years. I would like to go back there again some time. It was a lovely place."

A Report On A-20 Action in Russia

By Major Vladimir Zemlayanov

RUSSIAN AIR FORCE

Special to AIR FORCE by Cable

ON THE southern sector of the Soviet-German front, American bombers of the Boston III type have proved effective as attack planes in low altitude missions against German columns and troop concentrations and on enemy aircraft at airdromes.

Russian pilots find the Bostons greatly enhanced as fighting weapons when bombing is combined with strafing of enemy ground forces. Also, by suitably maneuvering, our Boston pilots can attack and bring down enemy fighters.

Using combined bombing and strafing tactics, Pilots Sirokin, Glusnov and Bloch in one flight alone recently set 15 German aircraft afire. In repeated action over several days, Captain Ossipov's squadron, flying Bostons, have destroyed 82 tanks, 247 trucks, 3,000 German soldiers and 7 bridges by such low altitude tactics.

This low flying has many advantages, and it preserves the element of surprise. Flying at low altitude makes it possible for our pilots to attack in bad weather under cover of low-hanging clouds. Thus, besides bombing, our pilots are able to fire point blank at the enemy with machine guns.

In view of these considerations, the armament of these planes has been somewhat modified in order to increase their firepower. The small caliber machine guns installed on Boston III's have been replaced by large caliber guns. Other details have been altered to increase bomb load and the number of bombs that can be dropped in series. The latter is highly important in bombing ground troops, especially columns on the march. New large caliber machine guns also give the Bostons better protection against enemy aircraft. It is only with such armament that our gunners can maintain fire against German Messerschmitts. Captain Ossipov's Boston squadron has shot down eight enemy aircraft.

Russian pilots flying American planes are constantly seeking new forms of combat tactics in an effort to achieve maximum effectiveness in every battle flight.

(The Boston III described above is the British and Russian designation for the Douglas A-20 light bomber.—The Editor)

PICTURE CREDITS

Cover: Courtesy Brown & Bigelow, St. Paul, Minn. 8-9: Air Forces Classification Center, AAF. 19-20-21: Erris Photos. 24: Ryan Aeronautical Corporation and Office of Emergency Management. 30-31: Air Service Command, AAF.

All other photos secured through Official Army Air Forces sources.

On Shining Shoes

By Pvt. Dennis Wiegand

OKLAHOMA CITY AIR DEPOT

ALTHOUGH I could probably make a lot of money by patenting my specially developed method of shining shoes, I am happy—in the interests of comradeship and a mutual dislike for K.P. duty—to pass my secrets on to you.

You probably received your first hints on the gentle art of shoe shining from that delightful character, "Old Sarge." There's at least one in every outfit and he knows all the questions before you get a chance to ask for the answers.

Old Sarge will tell you, in that imposing way of his, to get a bucket of water, a cake of sandsoap and a G.I. scrub-brush. Then you are supposed to scrub your shoes down to the bare leather. Naturally, this "G.I.ing" process injures the delicate tissues—or something. At any rate, you hear a lot about it, not to mention the added touch of sprinkling a few drops of water on the shoes before giving them the final brisk rub-down. Probably Old Sarge will mutter something about toning up the job by rubbing a few drops of glycerine over the fresh polish.

But the Army knows some of the answers, too, and new shoes are not finished as they are just to get you used to the feel of a G.I. brush. And now, after a four-month period of research, I seem to have proved that only the hard original surface of your G.I. shoes will take a deep polish. Leather softened by scrubbing and the use of saddle-soap will take a gloss or even a good sheen, but never that glassy glitter.

Some of the fellows have these fancy so-called shoe-shine kits with enough tins of paste and polish and enough brushes and daubers of all kinds and sizes to keep a cavalry regiment glistening. Of course this "remote control" method of polishing is good enough for a mass-production job. It'll pass inspection every time—but give me an old woolen sock for that fine hand-polish. Grapple that shoe with nothing but an old woolen sock between you and it and the can of polish. That's the secret of success.

For one thing, no one ever invented a dauber that would spread polish as evenly as the fingertips employing a gentle, rotating motion. And in the second place, a shoe-brush will always leave tiny grooves and scratches in the



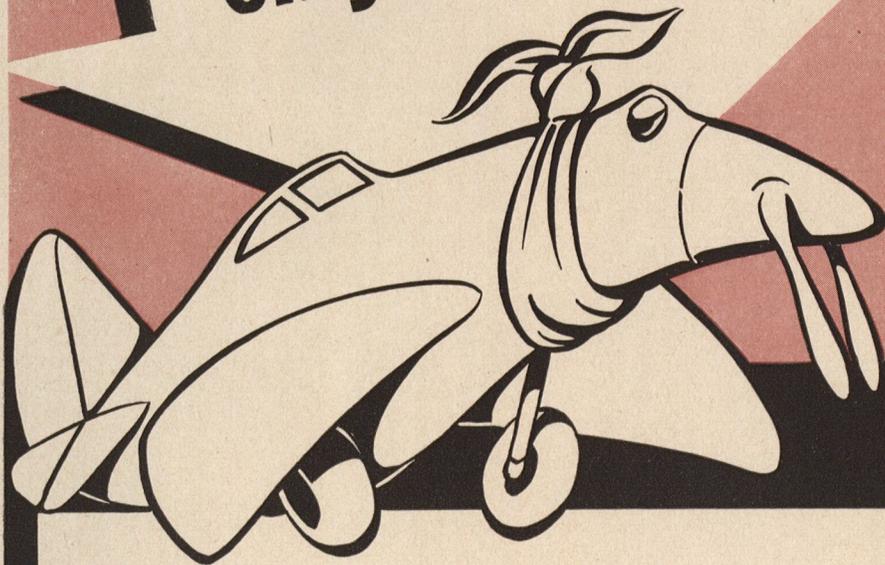
basic polish. You can't lay down that mirror-like finishing coat on a dull, scratched base. Moreover, these dark brown glosses you see around aren't strictly G.I. The G.I. brown has a slightly reddish tone preserved under a transparent glassy surface approximately $\frac{3}{32}$ of an inch thick.

Of course, I don't wear the shoes I've been talking about. I used to when I was taking my basic training but I goldbrick in an office now and most of us here find it more convenient to buy oxfords. My two pairs of G.I. shoes are reserved for inspection only. The soles and heels of one pair are pretty far gone, but they put up as good a front today as they did back at Fort Snelling the day they stopped the Major. They outshone over 1,000 pairs of shoes that day. They may be a little over-polished now—that can happen, too. But you can't detect a case of over-polish unless you get down on your hands and knees and inspect the edges of the stitching.

There's always the hope that some day we'll have a General making a tour of inspection. And maybe the sun will catch my shoes just right. He may even order new shoes issued to me; and order my old ones displayed in a glass case with a placard reading, "All Military Personnel Will Note: These Shoes Are Strictly G.I. And For Your Future Guidance."

Well I can dream, can't I!

Is there a
MEKIWI*
 on your field?



*MEKIWI (Mechanical Kiwi) is our name for a plane that has been grounded—mechanically unfit to fly because someone pulled a maintenance boner, failed to clear up a maintenance bottleneck, fell down on the all-important job of inspection, or failed to read and follow Tech Orders.

Airplanes are made to FLY! However, some do . . . and some DON'T! Most planes that WON'T fly are man-made MEKIWIS!

Good planes can—and do—become MEKIWIS because of a thousand and one careless maintenance and administrative mistakes. YOU know what these boners are and YOU know how to correct them.

Send us your ideas on improving maintenance. Your tips will help others!

*Pronounced "MEK-KEE-WEE".

GET THE MEKIWIS OFF THE GROUND!

ANSWERS TO QUIZ

on opposite page

1. (b) Congressional Medal of Honor. Others in order of rank are: Distinguished Service Cross, Silver Star, Distinguished Flying Cross.
2. (d) Russian attack bomber.
3. (a) Scott Field is nearest to Belleville, Illinois.
4. (c) Major.
5. (b) Draws maps or charts.
6. (b) To compensate for a plane's change in balance.
7. (c) A single place, single engine pursuit plane.
8. Reading left to right: Atracobra, Messerschmitt, and P-40. (If the middle plane fooled you, it's a Messerschmitt that was captured and repainted with British markings.)
9. (b) Human correctible failures.
10. (b) Project the flat surface of aerial photographs into third dimensional relief.
11. (c) A squadron. A squadron is the basic administrative and tactical unit; a flight is the basic tactical unit consisting of three or more planes; a group is both tactical and administrative containing two or more flights; and a command is both tactical and administrative with two or more wings or groups of the same class of aviation. 12. (d) A painted circle marked on the concrete apron at airports indicating the points of the compass.
13. (b) See that the chocks are under the wheels or that the brakes are locked.
14. (b) Below the stratosphere.
15. (c) A mountain range in New Guinea.
16. (c) Turn right.
17. (False) U.S.S.R. is the abbreviation for the Union of Soviet Socialist Republics.
18. (False) Don't take hold of the rip cord until you are out or you might open your parachute while still in the plane.
19. (False) The bombardier sometimes gives orders to the pilot, usually when lining up a target.
20. B-25.

On Giving Orders

From the equivalent of a regimental command down, the Germans prefer verbal rather than written orders, given in the presence of all unit commanders, to facilitate coordination and save time. The local terrain should be well known, independent of maps, and orders should be given in accordance with the terrain and not with the map. As an aid to clarity, the commander should place himself in the position of the receiver of the order.

What's your

AIR FORCE I.Q.



TEST your knowledge with this AIR FORCE quiz. Score five points for each question answered correctly. 50 is terrible; 60 means back-to-the-books; 70 is passing; 80 is damned good; 90 and you're excellent. If you make a 100—we'd like to see your idea of a quiz. Answers are printed on Page 40! No peeping. Ready! Contact!

1. The highest award which can be won by a member of the Army Air Forces is

- a. Distinguished Flying Cross
- b. Congressional Medal of Honor
- c. Distinguished Service Cross
- d. Silver Star

2. A Stormovik is

- a. A German paratrooper
- b. A Russian drink
- c. A wind tee to measure storm velocity
- d. A Russian attack bomber

3. Scott Field is located nearest to

- a. Belleville, Illinois
- b. Shangri-la
- c. Rantoul, Illinois
- d. San Antonio, Texas

4. In the R.A.F., a Squadron Leader is equivalent to our

- a. Lieutenant
- b. Captain
- c. Major
- d. Lieutenant Colonel

5. A Cartographer

- a. Manufactures automobiles
- b. Draws maps or charts
- c. Draws cartoons
- d. Carts graphs to overseas units

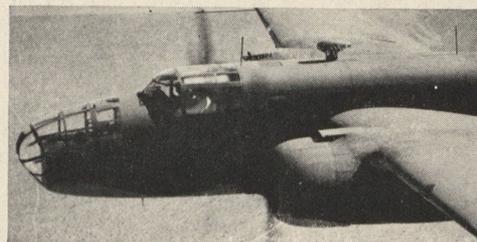
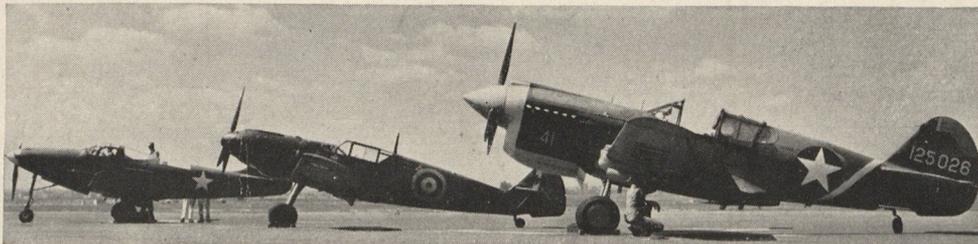
6. Trim tabs are used

- a. To give the plane its forward pitching movement
- b. To compensate for a plane's change in balance
- c. To help gain altitude quickly in a plane
- d. To keep tab of the trimmings you take in poker

7. The German Focke-Wulf 190 is

- a. A two place, single engine pursuit plane
- b. A medium bomber
- c. A single place, single engine pursuit plane
- d. A heavy bomber

8. Identify at least two of the planes pictured below:



9. Eighty percent of Army aircraft accidents in the United States are the result of

- a. Poorly equipped planes
- b. Human correctible failures
- c. Lack of instruction
- d. Bad flying weather

10. The stereoscope is used to

- a. Determine heart beats
- b. Project the flat surface of aerial photographs into third dimensional relief
- c. Adjust pitch propellers and control delivery of de-icing fluid
- d. Determine the amount of oxygen in the bloodstream

11. The basic tactical and administrative unit in the Army Air Force is a

- a. Flight
- b. Group
- c. Squadron
- d. Command

12. A compass rose is

- a. A pink rose of the American beauty family
- b. The method of determining compass variation and deviation
- c. A compass container
- d. A painted circle marked on the concrete apron at airports indicating the points of the compass

13. In making a pre-flight inspection check of a plane the first thing to do is

- a. Locate the fire extinguisher and first aid kit
- b. See that the chocks are under the wheels or that brakes are locked
- c. Check the ignition system and see that it is off
- d. Warm up and check the proper functioning of the engine and check the control services and the instruments

14. The troposphere is

- a. Above the stratosphere
- b. Below the stratosphere
- c. Some place in Russia
- d. Six miles due west of New Zealand

15. Owen Stanley is the name of

- a. The donor of the ice hockey cup
- b. The man who found Livingston
- c. A mountain range in New Guinea
- d. Assistant Secretary of War for Air

16. In routine flight when approaching a plane head-on you should

- a. Go over him
- b. Go under him
- c. Turn right
- d. Turn left

TRUE OR FALSE?

17. U.S.S.R. is the abbreviation for United States of Socialist Republics

- a. True
- b. False

18. Before making a parachute jump you should grasp the rip cord while still in the plane.

- a. True
- b. False

19. The bombardier never gives orders to the pilot

- a. True
- b. False

20. The plane below is a

- a. Martin B-26
- b. North American B-25
- c. Lockheed Hudson
- d. Curtiss Commando

Don't pay for your ride
with **CARELESS TALK!**



REMEMBER . . .

**WHEN YOU OPEN THE DOOR
— SHUT YOUR MOUTH!**