The FIELD ARTILLERY Journal

DECEMBER, 1944

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FIELD ARTILLERY GUIDE

Second (THOROUGHLY REVISED) ***Edition***

★ ★ ★ ★ ★

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"I found the first edition invaluable as a reference and refresher in my duties as Asst. S-3. I anticipate this edition to be even more helpful."

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U. S. FIELD ARTILLERY ASSOCIATION

1218 Connecticut Avenue, N. W. Washington 6, D. C.

LT. COL. JOHN E. COLEMAN, *Editor*
MAJ. BERTRAM H. WHITE, *Assistant*
LENNA PEDIGO, *Business Manager*

MONDAY, DECEMBER 18th, is a date to bear in mind. At 5:30 PM on that day your Association's annual meeting will be held at the Army and Navy Club, 1627 Eye St., NW, here in Washington. All members who are in this vicinity at that time are both cordially invited and urged to attend. You will enjoy it.

EFFECTIVE with this issue our "pony" edition for overseas readers will be reproduced by an entirely new process. Type will be sharper, but more important is the infinitely greater clarity given the illustrations. It is a definite improvement.

NEXT MONTH will bring a fine account of the use of medium artillery in Burma. This difficult and important theater is too little known. We are glad to help shed light on it.

M-12s were a mainstay in our rush across France and Belgium. Their work will be outlined.

Also "in the works" is one of the finest forward observer stories of the war. We hope too to publish articles on night aerial observation, and on obtaining locations by sound.

As always, the backbone of the January *Journal* will be accurate, authentic, and useful articles direct from combat areas.

RECENTLY several cases have come to light where expiration notices and statements have been delivered although no *Journals* had been received for months. These, of course, were instances where the members had failed to give us their changes of address. First class mail receives directory service and is forwarded overseas; second class matter does not follow you automatically.

In these cases no *Journals* had been returned by the Post Office Department, to warn us of non-delivery. Obviously some one at the old stations was enjoying a "free ride."

If your friends aren't receiving their magazines (or if you read this in a friend's copy, your own being missing), *please notify us at once of the correct address*. We want *every* member to receive *every* issue *on time*.

The United States Field Artillery Association
ORGANIZED JUNE 7, 1910

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The Field Artillery Journal

DECEMBER, 1944—Vol. 34, No. 12

Published monthly by the United States Field Artillery Association. Publication office 3110 Elm Avenue, Baltimore 11, Md. Editorial and general offices United States Field Artillery Association, 1218 Connecticut Avenue, Washington 6, D. C. Address all communications for publication to the Washington office. Entered as second class matter August 20, 1929, at the post office at Baltimore, Md. Accepted for mailing at the special rate of postage provided in Sec. 1103, Act of October 3, 1917, Copyright, 1944, by The United States Field Artillery Association. Subscription price $3.00; Canada $4.00; foreign $3.50; single recent copies to members, 25 cents; non-members, 35 cents. THE FIELD ARTILLERY JOURNAL does not accept paid advertising. It does pay for original articles accepted but unsolicited manuscripts must be accompanied by return postage if they are to be returned. ***Addresses and ranks will be changed as frequently as desired, upon notification; not otherwise. Changes should reach the editor three weeks before date of next issue. Immediate notice should be given of any delay in the receipt of the magazine.***

Authors alone are responsible for statements made. ***No articles are official unless specifically so described.***

Christmas Message

LIEUTENANT GENERAL BEN LEAR

COMMANDING GENERAL
ARMY GROUND FORCES

To the Officers and Men of the Army Ground Forces:

This is our fourth Christmas at war, and I should like now to reassert my pride in our war Army and my gratitude for its splendid accomplishments.

On our first war Christmas, while both our enemies roamed almost unchecked across the lands and seas they had marked for plunder, virtually none of our ground combat forces had yet left the United States. Today the story is happily different. Nearly all our ground forces are arrayed in massed strength in every corner of the world—not as green recruits thrown hastily into a last-ditch defense, but as a well-trained, highly skilled, mighty combat Army dedicated to the destruction of hostile forces, the liberation of conquered nations, and the establishment of lasting peace.

The cost of victory is never small, and we have had to pay a fair price so far. It is the lot of the ground soldier, and particularly of the Infantryman, to come to closest grips with the enemy, and both our enemies—strong, cunning, and resourceful—have clearly shown their intention not to yield without having first exacted all toll possible of our men.

In the campaigns of the last three years, many of our ground soldiers, including General McNair, our great former commander, have given their lives in battle.

For them, there can never be another Christmas. For those of us who must carry on the fight for which they gave so much, no Christmas can be truly merry until we have finished the job they started.

I know that you American ground soldiers will finish the job, and finish it well. I have seen you grow old and wise in the ways of war, outsmarting our enemies, winning the admiration of your allies and the everlasting respect of your fellow countrymen. You deserve a fine Christmas. To those of you who are still waiting your turn to meet the enemy and hasten our victory, and to those of you who have already achieved so many great triumphs, I extend my sincerest congratulations and wish you the best Christmas a soldier can have.

SEA ISLAND SERENADE

The Recapture of Guam

By Brig. Gen. P. A. del Valle, USMC, and Col. J. A. Bemis, USMC

Some person with an especial facility for expression once used the term "shooting war." If we may borrow the phrase without all of its original meaning, but adding some of our own, we may call the campaign on Guam a "shooting war." But, lest field artillerymen take too much of the credit unto themselves, it is well to explain at the very beginning that naval gunners and aviators formed part of the team, and that all three together—in the best coordinated, most effective teamwork the writers have ever seen—laid down the fire power which so greatly assisted the foot troops in the conquest of the island. The Navy gave us the same fire support from their ships and airplanes as could possibly have been secured with field artillery and land-based aviation. They stood in at point blank ranges and poured in the fire from the sea and from the air with superb disregard of the danger to their ships and planes. And they followed the same approximate pattern of fires as would have been employed had there been land upon which to base the supporting fires of the attack. The field artillery cannot begin the story of its own performance without pausing to doff its muddy helmet and give three hearty cheers for the shooting job from sea and air which was done by the boys with the bell-bottom trousers.

It is necessary to sketch out the main portions of the campaign in bold outline in order to fit the artillery picture into this frame. The island of Guam is some thirty miles in length and averages about six miles in width. It is shaped somewhat like a humped peanut with its concavity on the eastern shore, and the hump formed by the Orote Peninsula—Apra—Cabras Island on the west side. The line of ridges and peaks which begins south of Adelup Point in the north and takes in Mt. Tenjo, Mt. Alifan, and Mt. LamLam extends southward almost to Port Merizo and forms the watershed. These hills, from Adelup Point to include Mt. Alifan, are the controlling ground which dominates and overlooks Orote, Apra, Piti, Agat, and Agana.

General Operations

Landings were designed to enable us to seize this high ground quickly. It was estimated that the enemy would employ this massif to provide observation for artillery emplaced generally in defilade to the east of it and covering the shoreline from Amantes Point to Facpi Point. This shoreline, while protected by reefs, was yet the only practicable landing area due to the nature of the ground and the weather everywhere else. The enemy had recognized this and had improved the barrier provided by the reefs with beach obstacles, wire, and mines. These were backed by a string of concrete pillboxes and enfilading batteries of light caliber. The reefs varied in width from three to seven hundred yards and, save for pot holes, were practicable for foot troops. The tides made a difference of about two and a half feet in the depth of water over them, high tide being about four and a half to five feet.

The 3d Marine Division (① on map) was to land between Adelup Point and Asan Point, extend quickly to seize Piti and Cabras Island, and capture the high ground to the southward to include Mt. Tenjo. The 1st Brigade (② on map), with a combat team of the 77th Division attached, was to land between Agat and Bangi Point; seize Mt. Alifan and the saddle extending from there to Mt. Tenjo; and extend to the northward to a junction with the 3d Marine Division, isolating Orote for a coordinated attack later on. The 77th Division (Army) was in Corps reserve afloat. The situation in the south being most favorable, the 77th Div was landed over those beaches and quickly relieved the units of the 1st Brigade along the beachhead, permitting the latter unit to seal the neck of Orote and take up position for a coordinated attack to seize the peninsula and the airfield on it. This division, pushing patrols out vigorously to front and flanks, found itself in a favorable position to do so and soon captured Mt. Tenjo, thus assisting the 3d Marine Division and hastening the complete seizure of the Corps Beach Head Line.

Meanwhile the Brigade, necessarily making a frontal attack along a narrow front, seized the Orote Peninsula against strong and determined opposition. They were immediately afterward put in Corps reserve, while the 3d Marine Division and the 77th Division, attacking abreast, commenced a coordinated attack to seize the general line Agana—Pago Bay. This attack was completely successful: it did not stop on its objective, but pushed on through the northeast, driving the enemy before it until the entire peninsula was in our possession. The entire southern portion of the island, covered by patrols from the 1st Brigade, was found to be undefended. Save for the inevitable snipers and small groups hidden in caves, the Island of Guam was again ours. It had taken about twenty days of fighting on shore, which—considering the size of the place, the rugged nature of the ground, and the lack of roads—was quick work. But the Navy had done its work well.

THE ARTILLERY ASPECT

Artillery support for the land operation was provided by the 12th Marines (two 105-mm and two 75-mm howitzer battalions); the artillery of the 77th Division (three 105-mm and one 155-mm howitzer battalions); the Brigade Artillery Group (two pack howitzer battalions); and the Corps Artillery of the III Amphibious Corps (one 155 (gun) battalion, two 155 howitzer battalions, and two Defense Battalions). These last landed initially with light antiaircraft groups plus two batteries of 90-mm AA. All of the artillery was in operation by D+2.

The assault infantry landed at 0830, then the light artillery, by battalions, began landing at 0930. Baker Battery of the 1st 155 Howitzer Battalion landed on D+1 day and was attached to the Brigade Artillery Group. One of the 77th Division's 105 howitzer battalions, supporting the 1st Brigade, landed on D-day, as did also the Defense Battalions. The other elements of the Corps Artillery began landing on the night of D/D+1; by D+2 all artillery was ashore.

Landings

All artillery units sent their reconnaissance and survey teams and forward observers ashore well in advance, as required by their functions. Battalion reconnaissance parties were generally composed of the battalion commander, his operations, survey, and communications officers. These preceded the battery reconnaissance parties, which included the battery comander, his reconnaissance officer, signal sergeant, one NCO from each gun section, and a demolition section. Batteries when landed were thus met at the beach and guided to the selected positions. Ammunition was ordered to battery dumps until filled and then as directed by the battalion commanders. Corps Artillery ordered the necessary shifts in ammunition of like calibers as required. Batteries were not to be assembled on or near the beaches, but each piece as landed was to be guided into position and emplaced. Registration commenced as soon as the first piece of each battery was in position. This procedure was successfully followed.

The light artillery, boated in DUKWs or LVTs, came over the reefs and into position with minimum losses and little delay. Since the beaches are always shelled and sometimes are under machine gun fire, the less time consumed getting our guns across them the better. The system employed here with the light batteries of the assault units seems to be at least "an approved solution." These vehicles are likewise the answer to the ship-to-shore ammunition supply for the field artillery as they eliminate handling at the beach, thus avoiding both danger and delay and saving manpower—on which enough calls will be made anyway.

The guns and howitzers of the Corps Artillery were taken as far as the reefs in LCTs or LCMs. They used TD-18 tractors as prime movers. These were waterproofed and negotiated the reefs in all conditions of tide without difficulty, pulling their pieces. On one occasion an LVT pulled one of the howitzers over the reefs. The army units had the M-5 tractor for their 155 howitzers; these proved very satisfactory. No vehicle can take the 155s directly from ship to battery position as is the case with the light artillery. On the other hand, by the time they land, the beaches should be under much lighter enemy shell fire. The use of DUKWs and LVTs for ammunition supply, however, is necessary for all calibers. It was noticed that the M-5 high speed prime movers occasionally dragged palletized 155 shells on their sleds where the going was muddy, and over the deep sands. This method likewise reduces handling; it also provided a conveyance over bad terrain, and perhaps a fourposter bed for some lucky man at its destination.

Maps and Survey

In the matter of maps and survey we were far better off than we were on Guadalcanal. The maps provided were excellent, and accurate enough for our purposes. Elevations were not exact, but were sufficiently accurate to make little difference, due to the relative accuracy of the horizontal control. There were several revisions of the Marine Corps School's Topographical Map, scale 1/20,000, reproduced in various scales, all gridded to one thousand yards and some employing an ingenious grid within the grid to facilitate the designation of target areas. Where necessary, the artillery further subdivided these subdivisions in reporting targets, so that we could designate them within a 50-yard square. Some complaint that the overprinting of the grid subdivisions made the topographical features of the maps difficult to see was justified, but on the whole, for our purposes, the system worked beautifully. If an objection be made to the overprint, then templates could be used. But the overprinting was and is bound to be the quicker method.

The Corps Artillery Survey Section landed on D-day and initiated the corps survey control. Gaan Point, just below Agat and about the center of the landing beaches for the southern landings, was selected as the initial point and a direction line was determined by a sun sight. The Corps Artillery, the 77th Division Artillery, and the Brigade Artillery ran their surveys from there. Only the 3d Marine Division, due to their position in another beachhead not yet joined, was omitted initially. As soon as the junction was effected they too were brought in. The corrections and adjustments were trifling—usually under 5″.

From then on Corps survey control was practically continuous within our own territory. The line was run out beyond Agana with plenty of markers to give both our own battalions and the divisional artillery their coordinates and direction. Corps markers were black and yellow, while the battalions used the same colors as their range poles. We were not always sufficiently ahead to enable all units to be linked in before commencing to fire in new positions during the rapid advance, but the delay was never serious and we were in a position to mass fires very soon after every displacement. Control in the target area was by a series of check points carefully shot in by air spot. Our adjustments ran generally under 5″ save once when the air spotter took the wrong check point; this was soon discovered and corrected. A survey information center was maintained at Corps Artillery by the survey officer. All in all, the survey operations were most satisfactory. A check by triangulation was attempted, but we ran into terrain difficulties so this proved of little value.

Counterbattery

There was no sound ranging apparatus available. There were flash ranging stations, but the enemy's habit of firing only when rain or fog prevented flash observation rendered these of minor value. Air spot, reports from organizations receiving fire, and all the lucky breaks that we sometimes get made the problem of counterbattery relatively easy. The counterbattery officer at Corps Arty operated a counterbattery chart and an enemy battery file, and received all counterbattery

DUKWs and 105s make a fine amphibious team. Howitzers are porteed straight from ship to gun pit. Ammunition and supplies are delivered the same way, with a minimum of delay and man-handling.

information from observation posts and other sources.

There was sufficient artillery of the proper calibers to keep enemy artillery neutralized about 95% of the time. Captured pieces show the effects of our fire. Since there were other agencies employed in counterbattery we cannot claim much else with accuracy. It is sufficient to say that this all-important mission of Corps Artillery was successfully handled, and that at no time was enemy artillery allowed to interfere seriously with the progress of our infantry.

Enemy counterbattery was ineffective. It was never able to neutralize any of our units to the extent of interfering with a fire mission.

Communications

Employing radio initially, then wire with the radio as a supplementary means to our own and to supported units, is our standard procedure. It should have functioned perfectly but for those little incidents which make communicators' hair turn prematurely gray and make the commander gnash his teeth.

Our radio jeeps were towed over the reefs and were, for the most part, inoperative for some time. Due to our central location, however, we were able to run wire very quickly to everybody but the 3d Marine Division, which was initially on another beach. As soon as the first patrols got through to it the Corps Artillery wire teams ran their lines up to them. Meanwhile we borrowed a radio jeep from one of the battalions and operated with that and one of our own which we dried out quickly. We were thus able to maintain communications with the Corps CP, still embarked, and with the spot planes then being furnished from carriers.

We had a little trouble with our frequencies in communicating with the spot planes at first, but soon adjusted to them and operated satisfactorily thereafter. Radio with the Corps CP never failed. We had radio trouble with the 3d Marine Division because at first they were behind a hill mass which blocked them off. Our communications with their artillery during the early period was vicarious, through command circuits. Later, when we ran our wire up to them, we ran into bulldozer trouble as the construction people were struggling with the roads. The teams doubled back cross country over some very rugged terrain to try to beat this difficulty. Once radios were set up on the high ground, they functioned very well.

Wire worked very satisfactorily during the early stages, when the units did not move great distances. We had the battalions parallel their lines from one to the other, so as to give us access to them through their boards if our direct line to one of them went out. When rapid displacement began, however, it was almost impossible to keep up. We had neither sufficient wire teams nor enough motor transportation to enable us to put out the wire and service it, even when we borrowed from battalions. Our motor transport had as usual been cut in two before embarkation due to lack of ship's tonnage. There are times when a communicator's life is definitely not all "beer and skittles." Radio immediately resumed where wire left off, however, so there was always some kind of communication. Next time we shall (1) bring enough wire teams; (2) bring enough motor transport; (3) bring our radio jeeps ashore in LVTs or DUKWs. We live and learn.

Observation

Observation, both ground and air, were eminently satisfactory. Early seizure of Mt. Alifan gave everybody but the 3d Marine Division artillery a ringside view of his target area. As soon as Mt. Tenjo and the ridges to the northward were taken everybody had a front seat. This happy condition lasted until the target areas were reduced to the very thickly wooded Northeast Peninsula, when we again returned to the forward observers and the air spotters. The fleet furnished planes and pilots for artillery air observers from dawn until dusk every day until we had captured the Orote field, when the VMO squadron under Corps Artillery control took up the task. They were flown from a carrier and were ready to operate immediately. There was no interruption of air spot. The pilots of this squadron did a magnificent job, getting targets for us at great risk to themselves, flying extremely low over enemy territory.

All channels of artillery observation led to the Corps Artillery A-2. The enemy could not move without bringing down our fires. As soon as the Tiyan field came into our hands the VMO squadron operated from there, further shortening their distances. It was, all in all, nearly ideal as far as observation went. The last Corps Artillery CP was on the site of an officers' club, on a hill overlooking Agana and the entire northern area of the island. It is seldom the commanding general can watch his battalions fire, and also observe the bursts or the smoke and dust over the target area from the same spot. That was our good fortune in this case.

First Phase Summary

From the time of the landing on D-day until the complete seizure of the Corps beachhead, including the Orote airfield and the harbor area, the artillery set-up was mostly stationary, save for changing direction of fire and one or two small displacements made in anticipation of the general advance, or to mass fires more effectively. This first phase worked very smoothly, even though we were still faced with the problem of firing several directions. At one time there was our own attack on Orote to support, while an enemy counterattack

against the 3d Division from the opposite direction had to be broken up. It was here that operational control went into action.

Massed fires, where required and when required, were effectively used. One morning a preparation was laid down by the equivalent of seven battalions on a front of 1,000 yards in front of the 1st Brigade on Orote Peninsula. On this occasion the infantry advanced about 500 yards without finding anything living in front. While we were taking care of the threat from the opposite direction, we were able to keep a minimum of four battalions on Orote at all times.

SECOND PHASE SUMMARY

During the second phase, when we were attacking northeast from the beachhead with two divisions in line, the artillery problem became a little more difficult. Although we could breathe a sigh of relief that we had but one direction of fire to worry about, the difficulties of displacement, with our motor transport reduced in half and with insufficient wire teams, were considerable. The advance, which began at an even rate, became faster and faster. 155 howitzers often had to displace well forward of the pack batteries, since these latter could give close support up to the last minute while the mediums had to jump a good distance each time to avoid too frequent displacements. An area would be picked out and the reconnaissance party would find that the front lines were still engaged there. One 155 howitzer battalion went into position before the infantry were done mopping it up, and killed nearly fifty enemy snipers while attending to their regular fire missions.

Ammunition dumps in rear, with only the one precarious route around Apra Harbor going from south to north and with the mud impossibly deep, just had to be abandoned. An ammunition ship was brought around to the very small channel facing Agana. The DUKWs saved the day by working like beavers and unloading her directly into the battery dumps.

If wire was out we used radio. To move one battalion the Corps Artillery often had to borrow motor transport from all the other battalions. Observation posts which were doing a lot of business one day would be out of it the next.

Nevertheless, we managed somehow, and the "serenade" was kept up day and night. At one time we massed seven battalions, four of which were 155s, on one target in front of the 77th Division. Infantry which went through that area testified to the complete destruction of the target area.

When our sweating gunners had fired their last round and began to overhaul their pieces, there was that in their beaming faces which said, "The artillery has done its job."

"Long Toms" reached out to help batter the Nips at long ranges, on this sizable island.

KEEP BEARINGS WRAPPED

Bearings are still among "the chosen few" at the top of the list of critical items used by the army. Therefore, constant attention to maintenance practices in the use and handling of bearings is one of the important duties of army personnel whose responsibilities involve operation and maintenance of mechanical equipment on which they are used. And no less important than their proper use in service is their handling before installation.

A common failing in this phase of operation is the tendency to take bearings out of the wrappers before they are ready for installation, or to fail to wrap them when they are being stored.

An unwrapped bearing hasn't got a chance against its mortal enemies—sand, grit, rust, and breakage—for it only takes a couple of grains of sand to score a bearing and turn it into a piece of scrap. A bearing stored in a bin without wrapping is subject to a constant shower of particles of sand and grit sifting down from items thrown in on top of it. A bearing placed on the running board of a vehicle or on a dirty workbench can pick up enough grit in one instant to ruin it in short order. Moisture from the hands will cause rusting as suerly as if the bearing were dipped in a pail of water, when there is no protective wrapping.

There are, of course, numerous other danger points in handling bearings which are equally vital. They must always be properly cleaned and lubricated, and in this regard it is essential that dry-cleaning solvents and lubricants be *clean*. Lubricant containers should therefore be kept covered as much as possible, to prevent dust and grit from settling and blowing into them. Hands, benches, rags, tools—everything that touches the bearing—must be kept *clean*.

Lubrication Orders and instructions in technical manuals must be followed to the letter, so that bearings are installed and lubricated properly.

Bearings are scarce—they *must* be protected. And the wrapping is one of the most important forms of protection. A bearing that is unwrapped for any reason should be wrapped again before storing. A bearing should never be issued unwrapped. Anyone who receives an unwrapped bearing should wrap it before storing. Bearings must be kept wrapped *at all times*—right up until the time they are installed.

SEA-GOING GRASSHOPPERS

By Lt. Col. Gordon J. Wolf, FA

Inherent flexibility of the liaison airplane is clearly demonstrated by the ease with which it may be adapted for operation in almost any type of terrain. The artillery's airplanes will not only operate from small restricted fields and roads, but its wheels may be replaced by skis for snow-covered terrain and, by the substitution of pontoons or "floats" in lieu of the landing gear, can make use of lakes, rivers, bays, and sheltered shore lines as landing fields. In fact, it has even been reported that in the Italian theater the type L-4 liaison airplane was successfully flown from a large swimming pool—an extremely large pool.

Tactical advantages to be gained by transforming the airplane into a seaplane are immediately obvious. In amphibious operations where the beach itself may be littered with equipment and spoil, the airplane may operate from just off the beach, providing the sea is sufficiently calm. Mountainous country may afford numerous lakes large enough for take-offs and landings, but be devoid of suitable landing strips. Jungle growth may provide few available landing areas, but it is usually well watered. The seaplane leaves no tell-tale marks in a river, laborious clearing is not required, and advantageous concealment can be found almost anywhere along the water's edge.

Starting the seaplane engine

Field Artillery liaison pilots now being graduated from the Field Artillery Pilot Course of the Field Artillery School are receiving instruction in the installation and maintenance of pontoons and the operation of seaplanes as part of their regular course of instruction. While comparatively few hours are spent in flying seaplanes, each student is given sufficient instruction to familiarize himself with the essential differences in the technique of seaplane and land plane operation.

SEAPLANE OPERATION

The most obvious difference between the type L-4 airplane and the same airplane converted for water operation is the additional weight resulting from the substitution of pontoons for the conventional landing gear. This adds approximately 121 pounds to the total weight of the airplane. Due to the added weight and the drag of the pontoons a considerably longer take-off run is required over water than would be required over level ground under the same conditions of wind and temperature. The payload of the airplane is proportionately reduced. If the radio and normal combat equipment are carried, and an observer as well, the seaplane may not be able to take off from the water if the temperature is extremely high. Under these conditions the pilot cannot carry an observer, and in combat performs the duties of observer as well as pilot.

Glassy smooth water, with no wind to ruffle its surface, is an unfavorable factor in seaplane operation. The hull of each pontoon is constructed with a V bottom and a "step" similar in design to that of a hydroplane hull. In attempting a take-off the throttle is opened and the stick held well back until sufficient speed is gained to get the pontoons up on the step. The stick is then eased forward. Then the pontoons no longer float in the water but ride across the top of it as does an aquaplane when towed by a fast boat. Sufficient additional speed may then be attained to permit flight. In glassy water it is very difficult to break the suction under the hull and get on the step. Under such conditions a fast boat may be used to stir up waves or the seaplane may be taxied about on the water and then its take-off run started across the disturbed area. Use of aileron to lift one pontoon out of water before the other is often helpful.

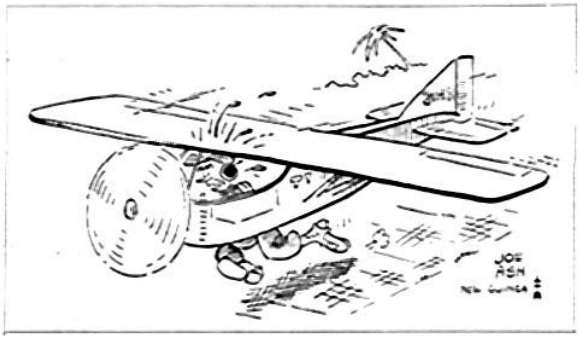
The most favorable condition for take-off is into a wind of 15 or 20 mph with a light chop on the water. Winds in excess of 20 mph are usually accompanied by waves too large for the liaison type seaplane to negotiate successfully. Attempted operation where the waves are over 2½ feet from trough to crest generally results in considerable pounding with resultant damage to the pontoons, wings, and struts. This pounding also slows down the seaplane to the point where take-off is difficult or impossible. Take-off at or near the stalling point offers considerable hazard since the seaplane may settle back onto the water and if one pontoon strikes the water before the other the seaplane will probably immediately and speedily capsize.

Aside from the additional weight, which tends chiefly to reduce the seaplane's take-off performance and rate of climb,

Hauling seaplane onto ramp

it handles in the air with no appreciable difference from the handling qualities of the land plane. In fact, it is somewhat more stable about its longitudinal axis than is a land plane, due to the lowering of the center of gravity because of the weight of the pontoons.

Under normal conditions a seaplane is landed in the same manner as a land plane making a wheel (rather than a three-point) landing. Hazards are presented, however, by two possible conditions. Glassy water again causes difficulty, particularly if there is a light haze present as is often the case on days of flat calms. It is almost impossible for the pilot to judge accurately his height above the water. Accordingly, he should attempt his landing near a shore line or near boats or pieces of floating equipment which will give him a reference point. If this cannot be done he should feel his way down at slow air speed in a power approach, maintaining a comparatively nose-high attitude and cut the throttle when contact with the surface of the water is made.



"This is the last fire mission I'm going to fly until they fix my landing gear!"

Handling the seaplane on the water in close quarters requires skill. It is essentially similar to handling a small sailboat. While the pontoons are fitted with water rudders, they are usually comparatively ineffective and the seaplane is maneuvered to and from a mooring, beach, or raft by the resultant of several forces acting upon it. These are the forward pull of the engine, the force and direction of the wind, and the force and direction of the current, if any. In calm water and still air the engine at minimum idling speed will move the seaplane through the water. Consequently, in coming up to a dock, for example, the ignition must be cut and the engine completely stopped with sufficient steerage way remaining to maneuver the seaplane to the desired berth. If there is any wind at all the seaplane is sailed to the desired location. If headed directly into the wind with minimum power, it will sail tail first downwind or with more power will go straight ahead. By using the proper combination of rudder and throttle in addition, it may be sailed to the right or left.

With controls neutralized the seaplane will always weathervane and head into the wind. Consequently, turning from an upwind to a downwind heading in a wind of any substantial strength may be a difficult operation and it may be preferable to sail the seaplane backward to the desired location downwind. Turning from downwind heading to an upwind heading offers considerable danger if the wind is strong. While in the process of the turn, centrifugal force will tend to bury the leeward pontoon. This will result in exposure of the under surface of the upwind wing to the wind and the two forces acting together may cause a capsize. Consequently, this maneuver should never be performed with power when the wind is strong: the turn should be started with a slight application of rudder with power off and the wind will do the rest.

In comparatively smooth water the seaplane may be taxied crosswind, but this may be dangerous if there is much wind and wave action. Since the leeward pontoon may be in the trough when the windward pontoon is on the crest, the wind may get under the upwind wing and again capsize is invited. This condition, of course, should also be guarded against in attempted take-offs and landings cross wind.

CARE AND MAINTENANCE

Pontoons presently available are constructed of plywood and so should be carefully guarded against breakage or damage by striking floating objects or fixed objects on the shore. Pounding resulting from take-offs in rough water quickly causes damage. Metal pontoons, when available, will be found considerably more sturdy and reliable, but may be damaged by excessive pounding or careless handling. Inspection plates are provided so that the several sections of the pontoons between the water-tight bulkheads may be examined, and the latter should be checked daily for evidence of leakage. Whenever possible the seaplane should be pulled up on the bank rather than left moored in the water untended—otherwise, a leaky pontoon might not be discovered in time to prevent the seaplane's submersion. The seaplane should be pulled well above high tide, however, and not subjected to the action of surf with resultant pounding and damage to the pontoons. When tied down ashore the pontoons may be filled with water to lessen the likelihood of damage by high winds.

In general, it may be said that the action of sea water is especially deleterious to the aircraft. Special care must be paid to prevent the accumulation of rust and corrosion on all metal parts through the use of protective greases, dope, etc. If possible the seaplane should be washed with fresh water after each exposure to salt water. Maintenance and inspections must be thorough and continuous.

YOUR "JOURNALS" ARE AGELESS

When renewing his membership, a Marine Corps major recently wrote:

"Please also send me the last twelve (12) issues of the JOURNAL. I have lost my last copies, and desire to replace them. The JOURNAL is almost indispensable to us out here. Only tonight I was reading a copy almost 18 months old, and found some very interesting things which I had forgotten."

Your JOURNAL can not (and doesn't try to) compete with current newspapers or news magazines. It does, however, publish material of solid worth—as useful in future years as when written.

MINDANAO

By Col. Conrad H. Lanza

Mindanao is the second largest island of the Philippines. In size it is exceeded only by Luzon. It has not quite 90% of the area of the main island, with a population (as of 1939) just under 2,000,000 and an area (including attached islands, less the Sulu Group) of 38,105 square miles.

Mindanao is very irregular in shape. Although much indented, the eastern half is roughly egg shaped. Its maximum length from north to south is about 285 miles, with a breadth of some 185 miles. This is the main part of the island. The west half is the Zamboanga peninsula, connected to the main island by a 15-mile-wide isthmus between Iligan Bay on the north and Illana Bay on the south. This peninsula is nearly 150 miles long, with a width varying from 15 to 60 miles.

In general, Mindanao consists of an interior mass largely of mountains and jungles, surrounded by a coastal strip. There is one exception: nearly in the center of the island near the west end of the main half is a plateau region which is partly settled and cultivated. The remainder of the interior is only sparsely inhabited by uncivilized natives. Some of the area has never been mapped.

Mountain ranges extend north and south in parallel series. For this reason there are no through east and west roads except along the coast, but several north and south roads traverse the island. Consequently invasions are most likely on the south and north coasts from where it is possible to advance into the central plateau area, which is the most likely assembly region for a hostile defending force. There are no railroads anywhere.

This central area is the key military one. It consists of the provinces of Lanao and Bukidnon, which are separated from each other by one of the north and south mountain ranges, across which up to 1941 there were no roads.

At the center of *Lanao Province* is Lake Lanao, 15 miles south of the port of Iligan on the north. Elevation of the lake is 2,300 feet, which results in the climate's being very agreeable. There is an excellent road, in part doubled but with some steep grades, from Iligan to Dansalan at the north end of the lake. Dansalan (population 11,319),[1] capital of the province, is near the former army post of Camp Keithley. There is a road all around the lake, which is 27 miles from northeast to southwest, and 12 miles wide. The east side of the lake is occupied mostly by Moros, the remainder by Filipinos who have settled in the province since the Americans introduced law and order. At the end of 1941 former differences between Filipinos and Moros had almost disappeared. The two races, notwithstanding differences in customs and in religion, got along well together.

From the south end of Lake Lanao is a paved road with steep grades to Malabang, 15 miles away on the south coast. At Malabang the road connects with the south coast road. Turning east, this extends into and through Cotabato Province on into Davao. Turning west, it ends shortly after crossing the boundary into Zamboanga Province.

Through Iligan extends the north coast road, running eastward to the northeast tip of Mindanao and thence down the east coast for about 65 miles. To the west this road extends into Zamboanga Province about 50 miles in an air line,

Iligan and Malabang are ports each having beaches suitable for landings. There is no protected harbor at either place. At Malabang the sea is frequently very rough, making landings in small craft dangerous. It is usually less rough in Iligan, which used to be the American supply port for the Lanao area; presumably it still is for the Japanese.

Around Lake Lanao is ample space to billet large military forces in a relatively cool climate. At the present time much food is raised in the area, and troops could be subsisted at least partially from local supplies. By means of the road net troops could be moved within one day to any part of the Mindanao coast, except Zamboanga Province, less the southeast tip of Mindanao, which has no outside road connections.

Bukidnon Province is just east of Lanao, and west of Agusan Province. The usual north and south mountain ranges without transverse passages form the east and west boundaries. This province is a plateau of rolling and fertile land around the Cagayan River (which flows north) and the Pulangi River (which goes south). Its area exceeds that of Lanao, being 3,104 square miles, but the population was only 57,561.

There is a good north and south road right down the center of the province. On this road near the center of the province is Malaybalay, the capital (population 18,816). At the north end of the road is the port of Cagayan, which is the capital of Misamis Oriental Province. The south end of the road extends into Cotabato and connects with the south coast road, thereby affording connections to Davao.

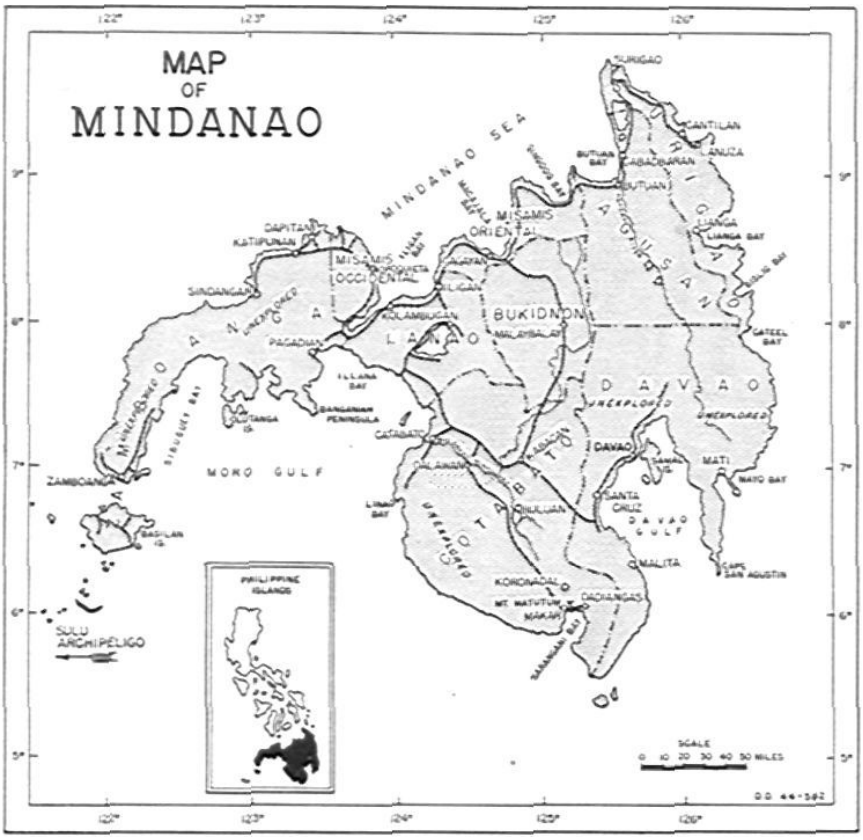
The enemy therefore has two north and south roads at his disposition, extending clear across Mindanao, one each in Lanao and in Bukidnon. The Bukidnon road has easier grades. Both are good military roads. The only east and west roads are along the coast.

As a military precaution for the defense there should be an interior transverse road between Lanao and Bukidnon. This would involve about 50 miles of construction over an unsurveyed mountain range having a minimum elevation of about 4,000 feet, or say 2,000 feet above Lake Lanao. There seems to be nothing insuperable about this, and it should be assumed that the enemy has had the foresight, within the three years at his disposition, to have constructed such a road.

Bukidnon is separated from the sea by the narrow province of *Misamis Oriental*, which also overlaps part of Lanao. This is a fertile coastal strip, raising cocoanuts and hemp and having the port of Cagayan. The area is only 1,512 square miles but the population is 213,812, nearly all distributed through numerous small communities. Cagayan, with a population of 48,084, is one of the largest cities of Mindanao.

Misamis Occidental is on the west side of Iligan Bay. It is the smallest province of Mindanao, having only 802 square miles. Its population of 210,057 makes it one of the most densely settled areas. The capital is Misamis, a port of 36,313 people. Largest city is Tangub, south of Misamis, with 44,743 people. Misamis is an open port but is suitable for invasion purposes.

[1]Figures as to population and areas in this paper are taken from the 1939 census of the Philippines.



The inhabitants of the two Misamis are Filipino settlers from the Visayas. The two provinces are connected together and with intervening Lanao by the north coastal road, and with the interior by the north and south roads through Lanao and Bukidnon.

Off Misamis Oriental is the island of Camiguin, about 14 miles by 9 and 6 miles offshore. It is well peopled. Main city, an open port on northeast side, is Mambajao (21,414 people). Two smaller ports—Catarman (9,484) and Sagay (9,907)—are on the southwest coast. A good coast road extends around the island.

Camiguin is a suitable place for an initial landing. Air fields are available. Its possession would interfere with enemy lines of communication from the north to his ports feeding the Mindanao plateau. The center of Camiguin is mountainous. Earthquakes are frequent, and there is one volcano on the active list. This first appeared in 1871, arising out of a field, and destroyed Catarman. This phenomenon seems to have been similar to the recent rise of a Mexican volcano. The volcano is still classed as dangerous.

Typhoons occasionally visit north Mindanao, but not often. However, their passage to the north causes violent rains and strong winds interfering with air operations. The central Mindanao plateau is free from typhoons and largely so from heavy rains. South Mindanao is free from typhoons, and in general from their distant effects. Military operations may be conducted against the south Mindanao coast at any time of the year. Against north Mindanao they may be interfered with during the typhoon season, which extends from July to November (both months inclusive). Interference is likely to affect the apporach of sea convoys from the east around the north end of Mindanao.

Agusan is the province just east of Bukidnon. Like that province, it lies between two north and south mountain chains. Through the center of Agusan is the river of the same name. Along this river and the coast are most of the population of just under 100,000. The area is 4,120 square miles.

Both sides of the river are bounded by jungle-covered mountains, with no roads and no established trails. There is no good road in the valley, but the north coastal road traverses the province. On this road near the halfway point between east and west boundaries is Butuan, the capital (population 18,295). A large part of the coast is bordered by nipa and mangrove swamps. Cabadbaran is a poor and open port on Butuan Bay. There are no worthwhile military objectives within this province.

Agusan is unusually fertile. It is about the only region in the Philippines where the sago palm is a prime food product. Rice and cocoanuts are raised generally.

Across the south boundary of Agusan is a low pass into Davao. Up to 1941 there was no road across this although it would be relatively easy to construct one through this pass. If the enemy has done so, it would give him a third line of communications across Mindanao.

Surigao is a narrow province on the north end of the east Mindanao coast. This province has an area of 3,080 square miles and a population of 225,895. Its capital and principal port is Surigao (population 34,339) at the northeast tip of Mindanao. The north coastal road extends to this city. The east coastal road starts at Surigao and goes south about 65 miles to Lanuza. Trails and road go 30 miles further south to Tago (population 15,271), from where there is no road along the east coast of the island. Communication is habitually by water.

Parallel to the east coast and close to it are the Diuata Mountains, which attain an altitude of 6,000 feet at the north end. This is a very rough range with no routes across it. The narrow coastal plain is subject to the northeast monsoon, which has its maximum rainfall during the winter months. It also receives rain during the typhoon season, in summer and autumn. There is therefore a considerable rainfall all the year around, with about 5 inches per month in June, July, and August and 20 in December. The curve of rainfall is almost a straight line for intervening months.

Surigao produces gold secured through hydraulic mining, which is the most economical method in view of ample water supply. At the north of the province is Lake Mainit, 21 miles from north to south and 9 miles wide; its elevation is 80 feet above sea level, and it is parallel to and only 5 miles from the seat at Butuan Bay. The little strip of land between lake and sea is jungle mountains. The north coastal road passes around the east end of this lake in a continuous 20-mile defile between the lake and jungle mountains. Negritos inhabit this area.

Immediately south of the provinces of Agusan and Surigao is *Davao*, economically the most important province in Mindanao.

The area is 7,529 square miles—second largest in Mindanao; population is 292,600, third largest.

Davao encloses Davao Gulf. On the east side of the gulf, the Diuata Mountains separate the narrow eastern coastal strip from the rest of the province. There is no coastal road, but one road 50 miles long extends across the Cape San Agustin peninsula at its base, from Taragona on the Pacific coast to Cuabo Bay on the gulf.

The city of Davao, on the northwest section of the gulf, is a fair port. Officially it is 60 miles long from north to south and averages 35 miles in width. Within this large area were nearly 100,000 people, largely Japanese and mostly engaged in hemp production. The natives include a small number of Visayans, very few Moros, and a considerable number of pagan tribes. The latter have learned to settle down and cultivate the soil.

From Davao a coastal road extends southward about 32 miles. This connects with the south coastal road into Cotabato, and thereby with the central plateau area. Northward from Davao the road extends to the head of the gulf, and thence continues northeastward into the interior to the headwaters of the Agusan River, ending at Moncayo, 12 miles south of the Agusan boundary. The possibility that this road has been extended down the Agusan valley to the north coast must be considered.

The west boundary of Davao Province is a high mountain range, the highest in the Philippines, with Mount Apo (9,688 feet high) as its principal peak. The south coastal road passes just south of Apo, which is an active volcano, a national park, and accessible by trails.

Davao's coastal region is subject to droughts. It is the site of extensive cocoanut plantations. The hemp plantations (*abaca*) are in the interior, where the rainfall is nearly constant in every month of the year.

The south coastal road reaches the Davao Gulf at Digos, 28 miles south of Davao. This used to be the only connection between the central plateau and Davao. A landing at Digos is practicable, also at Santa Cruz, 9 miles to the north. This little town has 33,808 people. A landing in this area would cut the enemy's line of communication to the Davao coast, along which most of the life of the province is found. Unless the route through the Agusan valley has been opened hostile forces near Davao city or north thereof would be isolated by seizure of the south coastal road.

Davao is a very good area for an initial invasion of the Philippines. Airfields are available as well as ports. The weather permits operations all the year around. It is nearest to Allied bases in the Netherland Indies, and as near as any to Palau.

Davao North Road, Km. 22, Davao Province

Cotabato Province is just west of Davao and south of Lanao and Bukidnon. The capital of the province is the small city of Cotabato (population 10,166) on Illana Bay. The south coastal road follows the shore line from Lanao to this city. Here it turns inland eastward up the Cotabato River valley. This is a wide fertile cultivated land, very similar to the plains of Luzon north of Manila. The province is the largest in Mindanao with 8,870 square miles and is second in population with 298,935 people. This province was originally peopled by Moros. They are outnumbered by Filipino immigrants who have settled in the great and fertile valley.

This valley extends generally northwest and southeast. About the center of the valley the Palangi River joins from the northeast, being almost at right angles to the Cotabato. Down the valley of the Pulangi is the main north and south Bukidnon road, which joins the south coastal road near Kabacan, 45 miles east from Cotabato.

The south coastal road does not follow the coast beyond Cotabato: at that town it goes inland in an east-southeast direction via Kabacan, to Digos on the Gulf of Davao, 100 miles from Cotabato.

As far as Kabacan the road runs through fertile inhabited country. Just south of Kabacan are extensive marshes at an elevation of 165 feet, 30 miles from north to south and 6 to 18 miles wide. East of Kabacan the rough terrain is largely unexplored on both sides. South of Mt. Apo the road goes through a low pass to Davao Gulf.

South of the Cotabato valley is a generally unexplored territory of jungle mountains, including several active volcanoes. The numerous villages along the coast are not interconnected by land. There are no roads or trails across this territory.

Cotabato can be invaded either from Digos or from Cotabato. 10 miles north of Cotabato is Polloc Harbor, which is a suitable place for landing.

In the extreme southeast part of Cotabato Province is Sarangani Bay, 20 miles deep and 10 miles wide. This is suitable for a base. Outside of small villages there are two towns on this bay—Buayan at the head (population 14,116) and Glan (9,364) at the southeast entrance. In 1941 a road was under construction from Buayan to Sapakan, 70 miles inland to the northwest, within the Cotabato valley and only 12 miles from a branch road leading into the main south coastal road. This short connection has probably been built by this date, affording the enemy communication with Sarangani Bay. This road leads up a valley with rather easy grades.

It would be possible to land in Sarangani Bay. Its principal advantage would be to afford a base for further operations, but the base would have to be constructed from the bottom up. An advance inland would be practicable, but it would seem easier to land near Cotabato rather than go 150 miles overland to reach the same objective.

Zamboanga Province is third in area but first in population: area is 6,517 square miles and population 355,984. This province is a long peninsula with an axis nearly 160 miles long. The interior is a mass of jungle-covered mountains, surrounded by a narrow coastal strip.

On the north coast the north coastal road enters Zamboanga

from Misamis Occidental and continues on a winding course for about 60 miles to Sindangan. Other towns on the road are Dapitan and Dipolog. All three have about 30,000 people each.

On the south coast the south coastal road crosses the east boundary from Lanao and goes to Pagadian (population 46,262), 15 miles from the border.

West of Pagadian on the south, and west of Sindangan on the north coast, there are no overland connections. The country is sparsely settled until the vicinity of the city of Zamboanga is reached. This city is at the southwest tip of Mindanao, and has a settled country behind it for 40 miles along the east coast and 20 miles along the west coast. This area has a road net.

Zamboanga is free from typhoons. Rains around Zamboanga city are at a minimum during January, February, and March, and thereafter are fairly constant. On the north coast, near Dapitan, principal city for that area, rainfall is high during the last three months of the year and low during the other months.

Zamboanga has a site peculiarly valuable for military purposes. It is almost ideal for an air and sea base to maintain operations over the Celebes Sea to the south, the Sulu Sea to the west, North Borneo, Palawan, and the Visayan Islands. 12 miles south of the city is the island of Basilan, 35 miles from east to west and 22 from north to south.

There is ample terrain near Zamboanga city and on Basilan for air bases and naval stations. It would be nearly impossible for the enemy, once driven out, to reinvade this area by land. There is space to spread billets for large numbers of troops in the neighboring country, and to install large depots.

Zamboanga city is reported as having a population of 131,455. This includes the back country, however, which officially is part of the city. A certain amount of labor can be counted upon as available.

COMMENTS*

Zamboanga and the central plateau region are the two great military objectives. In 1941 the American forces took position in the central plateau, while the enemy landed simultaneously in Davao Gulf, Illana Bay, Iligan Bay, and Macajala Bay. They then advanced upon the American forces by both the north and south Lanao and Bukidnon Roads from both ends.

Details of this campaign have not yet become known. Soon after the capitulation of Corregidor the American forces in Mindanao surrendered also. Whether the military situation at that date was desperate in Mindanao has not been ascertained.

According to reports as to numbers of prisoners taken, the American forces (including Filipino troops) numbered well over 40,000 men. It would seem, therefore, that a force of this size is too small to defend Mindanao against an enemy having air and sea control.

It can therefore be expected that if the enemy defends Mindanao, and present indications are that he will, he will have a greater force—one at least 50,000 strong.

Zamboanga is now (as in 1941) a detached post. There is no information as to whether the enemy will defend this area.

Although the Allies now have undisputed sea and air superiority, this does not assure that it will absolutely prevent all enemy replacements and supplies from reaching Mindanao after that island is once attacked. Due to the short distance from the numerous Philippine Islands just north of Mindanao, occasional intercourse may occur.

Information is that the Japanese have been building up their depots on Mindanao, so as to make it unnecessary to transfer additional supplies for a considerable time. The Japs are using submarine barges as well as surface barges. Although many of these are lost, they keep coming on. It must be presumed that in spite of blockades a certain number of these will get through.

The landing of Allied troops on the south shore of Mindanao presents the least difficulty. A landing on the north shore is subject to enemy air interference from island bases to the north. Narrow sea passages restrict movements. In 1942 the Japanese had neither air nor sea opposition on either the north and south coasts. The Allies do not now have this advantage. Some opposition, especially on the north coast, must be expected.

*This article was written prior to the Leyte landings.—Ed.

"JINX"

German Panzer units threatened to cut the Salerno beachhead in two on D+5 (15 Sep 43) when they opened a gap between the British and U. S. corps. A tank destroyer named *Jinx*, commanded by Sgt. Edwin A. Yost, is one reason the German attack failed.

The crew ran their M-10 up to the crest of a ridge under artillery and small arms fire. They expended three rounds. The first was short. The second knocked out a Mark IV tank, which burned. The third hit an ammunition truck, which exploded. Hostile fire became so heavy that the destroyer was forced to back down below the ridge.

A short while later Jinx again ran up to a hull-defiladed position. This time the first round knocked out a Mark IV. The second round knocked out a Mark IV. The third round knocked out a Mark IV. So did the fourth.

In an elapsed time of thirty minutes Jinx had five medium tanks and an ammunition vehicle, with a total expenditure of seven rounds.

The crew received silver stars.

—E. A. R.

LAST OF A "GRASSHOPPER"

Capt. Edward B. Baetjer, first artillery air OP pilot shot down by enemy aircraft in the Mediterranean Theater of Operations, gives this account of the incident:

"After an uneventful flight up, I was there just four days when "Jerry" caught up with me. I was on may to register-in the —— Bn when a flight of FW-190s on a strafing mission intercepted me. I was at about 1,500 feet, but they came upon me so suddenly from around a mountain that they didn't see me in time. The first five each let go a burst at me, but luckily didn't hit me so I headed for the ground. But like a sap, instead of landing I started circling at about a hundred feet. The next thing I knew a machine gun was barking again, and my engine sort of disintegrated. Little fountains of gas started shooting up out of the gas tank, and a blur shot past in front of me. By the time I cut my switch I was just over the trees and barely moving. Finally I stalled out and crashed through the trees, going through the windshield when I hit and knocking myself cold. Colonel ——, my observer at the time, hauled me out of the plane and to an aid station. He wasn't even scratched, thank God! At an evacuation hospital they sewed up my head, taking 29 stitches, and sent me back to North Africa."

—E. A. R.

AAF Weather Service and the Field Artillery

By Capt. Robert A. Porter, AC

It was at Cassino. The Germans were bringing up troops and supplies over a bridge out of range of our Field Artillery. Our biggest guns couldn't quite reach that vital span. Maj. David Ludlum, Air Forces weather officer attached to the Fifth Army in Italy, walked up with a forecast. "Wait a little while," he said. "A strong wind is kicking up and I think you'll be able to make it." At the time he had predicted the guns tried again, this time with the help of the boosting wind. They smashed the bridge.

This incident illustrates the closer ties between the Field Artillery and the Air Forces Weather Service which are growing out of the war. Projectiles and aircraft use the same medium, the atmosphere, and no matter which is hurtling through that medium, weather has a potent effect on the results.

Because of the global nature of the war the weather service developed on a world-wide pattern as an arm of the Air Forces. But there are a number of ways in which the service can also be utilized to advantage by artillery. By the same token, there are ways in which the meteorological sections of the artillery can help the Air Forces weather organization.

Details for such liaison are embodied in a new technical manual, TM 20-240, *Meteorology for Artillery*, which is now being compiled and will take the place of the old TM 4-240, *Meteorology for Coast Artillery*, which has been referred to by other arms as well as Coast Artillery.

This new source of meteorological information for the artillerymen in the field springs from the AAF network of hundreds of fixed stations, mobile units, and reconnaissance squadrons. The fixed stations (usually located at airfields) are permanently-established clearing housese for weather reports and forecasts. Mobile units are the compact meteorological outfits mounted on trucks and trailers which are handling weather at the front-lines. Weather "recon" squadrons are, as the name implies, flying units which probe into the overcast skies above Italy or the heart of a hurricane off Miami before a mission is allowed to start.

For administrative purposes the world is divided up into weather regions, each under a regional control officer and manned by a squadron. Field and Antiaircraft Artillery commanders have been furnished with a list of regional control officers and the suggestion that an interchange of the services may be worked out to meet conditions peculiar to each combat theater.

From artillery units the AAF weather network will obtain surface observations and upper wind data, the latter derived from the new wind direction finders. In turn the weather stations have been directed to make available their forecasts of density, temperature, and winds for standard artillery zones covering a 24-hour period.

Ground Force commanders were reminded of the weather factor in operations at the time of the landings on the Normandy coast. A special circular was sent out urging all commanders and staffs to take full advantage of the AAF weather service, adding that behavior of the elements was one of the most important considerations in modern warfare. The suggestion has been taken up on an increasing scale.

Some of the AAF weather men attached to various units as staff weather officers in the European theater have already had some schooling in Field Artillery problems. Within the last year 42 weather officers have gone through courses at Ft. Sill. They form a nucleus for just the kind of liaison plan that is being put into effect.

Methods, Old and New

With the appearance of new weapons and increase in unobserved fire, it was recognized that improvements might be made in firing with adoption of new instruments and techniques. It is apparent that the three weather factors entering into calculations—winds, density, and temperature—vary with altitude, and therefore their most precise measurement may be made by instruments carried aloft. However, the limited supply of this equipment and trained hands to operate it furnish another cogent argument for their use on an area basis by all interested arms rather than on an organizational basis.

What of the old methods? Let us take a look at them.

In determining the speed and direction of winds, for example, it has been the practice to release a hydyrogen-filled pilot balloon and through a theodolite watch its meandering course. Aside from any errors that creep in from assuming a certain rate of rise of the balloon, the method is limited by clouds and visibility. When the balloon disappears into a cloud bank there is no telling what the upper winds are and how they may deflect the shells that are about to travel through this particular section of the atmosphere.

It has been the custom in the past to measure air density by first determining density at the surface, then estimating the density to be expected at levels above the earth by means of tables. This method completely ignores the fact that weather behavior above the earth is erratic and subject to violent changes which may stray far from any table of averages.

The same holds true for ballistic temperatures as previously obtained. They have been based on the surface temperature and are estimated to decrease with height on the basis of the standard artillery atmosphere on which the firing tables are based. Here the percentage of error looms even larger than for density.

Temperature does not always automatically decrease as altitude increases; in fact, oftentimes it may be warmer by several degrees 500 to 1,000 feet above the earth's surface. This phenomenon results from the earth's radiation and cooling of the air close to the surface on cloudless nights, from the effect of cold ocean currents, subsidence of air in a certain type of pressure system, or other causes familiar to the meteorologist.

A typical temperature "inversion" might conceivably result in a layer of air at 1,000 feet being 15 to 20 degrees warmer than at the surface. Since the old method of computing temperatures above the surface arbitrarily assumes a decrease, the actual error between the true temperature and the estimated one becomes even larger in this case. With some guns, under these conditions this error alone might result in throwing a projectile 100 yards off its course.

What are the new methods?

For winds the meteorologist of today is using radio direction finding equipment and other techniques. As a result the course and velocity of winds may be accurately charted to high altitudes and without regard to visibility or cloudiness.

For sounding or probing into the conditions of the upper air at various levels, a device called the radiosonde has been developed in recent years. This is a handy little gadget consisting of a container about the size of a cigar box which encloses instruments for measuring temperature, pressure, and relative humidity. Towed aloft by a balloon, the radiosonde periodically emits signals to the receiving apparatus and forecasters waiting on the surface.

The AAF has installed these radiosonde stations in many parts of the world. With knowledge of the complexion of the upper air at the points of this network, the meteorologist can with a reasonable degree of accuracy compute temperatures, densities, and winds at places far distant from the weather stations themselves. Upper air masses are homogeneous affairs possessing similar temperature, pressure, and humidity characteristics although they may spread over thousands of square miles.

It is not feasible to set up a radiosonde with every battery of field guns because of the prohibitive cost and lack of trained crews. Therefore, it may readily be seen that artillerymen should have access to upper air data compiled by the air weather service, therefrom to make computations for ballistic temperatures, densities, and winds at their gun positions.

FIRING TESTS

With the appearance of new weapons and increase in unobserved fire, plus the new scientific methods just discussed, it became increasingly evident that improvements should be worked out.

To this end a request originated from the office of the Chief of Field Artillery more than three years ago. It was pointed out there had been no re-study of meteorological data and their effect upon projectiles since shortly after the World War.

Emphasizing that "the importance of the application of meteorological corrections in Field Artillery fire is so great and the efficiency of fire so diminished by incorrect meteorological data," it was urged that the subject be opened for a re-investigation by the Ordnance Department and Signal Corps.

On June 7, 1941, the project was authorized by the Adjutant General. It was called "Re-determination of Meteorological Corrections for Artillery Fire and Bombing." Concurrence in the basic recommendation was given by indorsement from the Chief of Ordnance, Chief of Coast Artillery, and Chief Signal Officer.

A series of tests was run off at Ft. Bragg, Camp Davis, Ft. Story, Ft. Monroe, and finally the culminating one at Pine Camp, N. Y., last winter. Participating in the final tests among the snow-crusted pines a few miles from Lake Ontario were officers from Ordnance, Field Artillery, Antiaircraft, Coast Artillery, Signal Corps, and the AAF weather service. This was the first time the air weather service had entered into the picture.

During the Ordance Department's winter firing program at Pine Camp several different methods of ascertaining weather elements were tried out; the results were sifted and compared. One was the conventional meteorological message, prepared from surface observations and the pilot balloon run. Radiosondes were sent up from Pine Camp, and upper winds were traced.

Finally, the Forecast Branch of the Weather Division, Headquarters Army Air Forces, Washington, D. C., prepared forecasts for the artillery trials. These forecasts for wind direction and speed, temperature, and density (all by altitude zones up to 30,000 feet) were prepared from the standard network of weather reporting stations and without reference to the surface or upper air observations taken at Pine Camp.

Two soldiers in foreground are holding a radiosonde, a 2-lb. box of instruments for measuring temperature, humidity, and pressure at upper air levels. It radios a running record of this data for the various layers of atmosphere through which it travels. In background a soldier is about to release the balloon which hauls aloft the equipment and also a parachute which carries the delicate instruments back to earth.

The nearest weather station to Pine Camp was 50 miles away, while the closest radiosonde reporting station was at Buffalo, more than 100 miles from the testing area. Yet the Forecast Branch was able to figure out the weather at Pine Camp accurately through the reports of its network and seasoned knowledge of the peculiar quirks of the upper air masses.

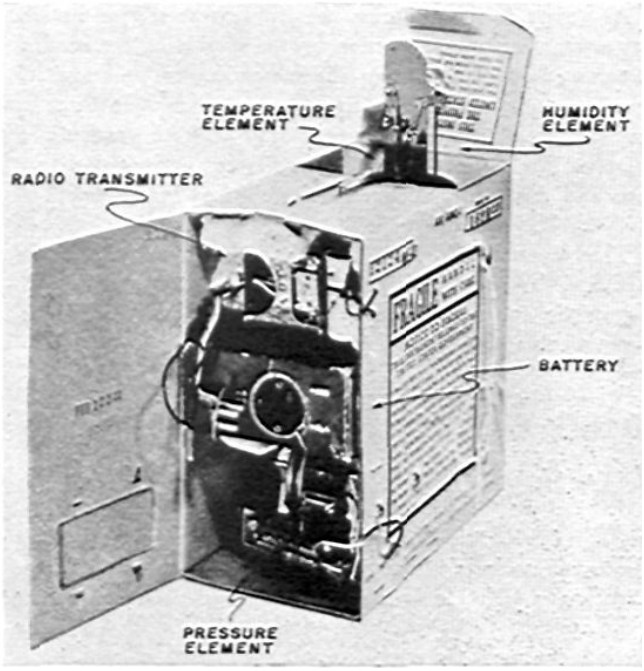
RESULTS

Actually, the Pine Camp trials revealed that above 3,000 feet the Weather Division forecasts of densities and temperatures were superior to the conventional artillery methods. High above the earth, where local influences (such as Lake Ontario not far from the camp) vanish, forecasts based on the general flow pattern and air mass distribution demonstrated their value.

Below 3,000 feet the spot observations of the artillery and estimates for the lower altitudes were more accurate than the forecasts, which had no knowledge of local surface conditions to fall back on. Thus, it would appear that a combination of methods would be best. This would be composed of estimates of densities and temperatures up to 3,000 feet from the surface observations and the use of forecasts from the weather charts above that height.

Another lesson taught by the Pine Camp tests was that when a network of upper wind observations is not available to the forecaster, the wind forecasts will not be so accurate as wind observations taken near the gun position at frequent intervals, perhaps four or more times daily.

Had upper wind data been available at Pine Camp and a large area surrounding it, there is no question but that the forecast winds would have been improved considerably. It is to be hoped that arrangements will be successfully concluded



Radiosonde used by AAF Weather Service

so that weather stations may have access to the information obtained by artillery units using new equipment for measuring upper winds. This would result in more accurate upper air analysis and improved forecasts for artillery as well as aircraft.

Undoubtedly, forecast winds will have their greatest usefulness when atmospheric conditions are rapidly changing, when frequent balloon ascents are impossible, and when the balloons cannot be observed to required altitudes.

Magnitude of Effects

This whole problem of developing the most accurate methods for charting weather is brought home most forcibly by an examination into the effects. Weather elements, of course, have a varied effect on different guns and settings. Taking an example, however, in the case of the 155-mm howitzer firing under winter conditions on the plains of northern Europe, it would not be uncommon to find a density correction of 600 yards, temperature correction of 400 yards, or a wind adjustment of 1,100 yards.

The following table depicts deviations from standard which can cause a miss of the target by 100 yards, for two common settings of each of two standard weapons.

Meteorological Effects Which Separately Yield a Miss of 100 Yards

Ballistic Element	105-mm Howitzer, M2 Deviation from Standard		155-mm Howitzer, M1 Deviation from Standard	
	Elev. 350 mils, Charge 5	Elev. 800 mils, Charge 7	Elev. 350 mils, Charge 5	Elev. 800 mils, Charge 7
Ballistic Density (standard 100%)	11.1%	1.9%	4.1%	1.3%
Ballistic Temp. (standard 59 F.)	111.1 F.	23.4 F.	25.0 F.	37.7 F.
Ballistic Range Wind (no wind assumed)	21.0 mph	5.2 mph	12.3 mph	4.9 mph
Ballistic Cross Wind (no wind assumed)	85.9 "	10.5 "	50.0 "	9.1 "

Wind effects will vary with direction and speed, of course. The effect of an increase of density over standard is to decrease the range. Non-standard temperature can either decrease or increase the range and the effect is greater when the projectile speed is in the critical range near the speed of sound, which, of course, varies with temperature. In this range occur the phenomena known as compressibility shock waves, or compressibility "burbles." In general, at speeds above the critical range the effect on range for an increase in temperature is negative.

Thus, an accurate picture of the temperatures aloft in the layers of the atmosphere through which the projectile passes is of major importance in correcting low muzzle velocity guns. It is possible for a shell to pass through the speed of sound three times on its way to the target. The projectile may start out above the speed of sound; it then may drop down below that speed as it climbs upward; then, as it descends, gravity may pull it above the speed of sound again; until, finally, denser air close to the ground may slow it up to the speed of sound again.

New Meteorological Message

Arising from the tests and of practical interest to the artilleryman is the development of a new meteorological message. Formerly, two messages were regarded as ample for meteorological correction of all weapons: message 2 for antiaircraft and high angle fire, and message 3 for low angle terrestrial fire. However, the introduction of new ground fire weapons of high muzzle velocity made it imperative to write a new meteorological message to meet the special needs of the new armament. This has been designated message 4.

In addition, such newcomers as the 155-mm gun and 240-mm howitzer have necessitated that values for maximum ordinates from 30,000 to 48,000 feet be included in the messages.

Further, ballistic temperatures varying with the maximum ordinate of the projectile's trajectory have been included in the new message and added to message 3. The possibility of more accurate measurement of weather aloft has permitted greater refinements in the recording of density and temperatures. The message includes ballistic wind data, ballistic temperatures, and ballistic densities (reported now to one tenth of one per cent instead of in whole per cents) for each altitude zone required by the using arm.

Teamwork

As we have seen, one of the compelling reasons for teamwork between the artillery arm and air weather service is the need to pool their equipment. There isn't enough to go around so that every artillery unit may have radiosonde apparatus or that every weather station may be supplied with the latest device for determining upper winds through an overcast. How will it work out?

According to plan, the initial liaison for exchange of meteorological information will be at the top, with the highest echelon of the artillery arms and the regional control officer of the local weather region, or director of meteorological services. A director of meteorological services is an officer over several regions in a critical combat area such as Europe.

Through this original liaison it will be decided which weather installations will be most suited for relaying the forecasts to Field Artillery corps observation battalions, as well as Antiaircraft operations rooms and Coast Artillery harbor defenses.

Artillery units and the weather units selected will be directed by their respective higher headquarters to make all necessary arrangements for the exchange. The Field Artillery corps observation battalions will disseminate the information to gun battalions and subordinate division artillery headquarters.

Flowing in the reverse direction will be the data coming in from artillery unit observations on its way to the AAF weather organization. Finally, the meteorological information originating with the artillery units will be fed into the weather network. Forecasts will be shaped up on the basis of this more concentrated reporting network. The more weather reports in for a given area, the more accurate become the forecasts.

As a part of this program the air weather service already has made a minor contribution toward improving the conventional method of preparing the meteorological message for density and temperature. The tables on which these elements are based are predicated on aeroclimatology. AAF weather men compiled the aeroclimatological studies for northwestern Europe and this information will be embodied in the new TM 20-240.

That was only a stopgap, however, a continuance of the old methods. The real goal is the working out of a smooth-meshing system for the constant interchange of information between air weather men and field artillerymen.

Headquarters Battery in an Active Theater

By Capt. W. V. Ledley, FA

When the current T/O & E for the Battalion Headquarters and Headquarters Battery were published, it soon became evident in the light of our past combat experience that a sharp change in organization had been introduced and that a new method of operation was necessary. First of all we no longer had the Antitank Platoon as a reserve of manpower, and secondly, owing to transportation changes, it appeared that we would not be able to carry any authorized overstrength. It was then necessary to review the organization and determine what functions and duties could be combined in order to free some extra men in line with our own special requirements and to effect a general economy of manpower which would allow the sergeant major and battery first sergeant extra men for use when called upon for special details. The next step, which followed during our long stay in England, was to train every man possible in at least one additional duty.

Message Center

Our message center had much trouble trying to function with the personnel available to it. It had inadequate transportation. It had a tendency to degenerate into a clearing house for written messages only, due to the large number of messages cleared directly through the radios and by direct telephone conversations.

We decided to take drastic action by entirely eliminating the message center as a separate entity and delegating its functions to the radio section. The radio section normally had had a good number of off-duty, on-call operators immediately available for use as short distance messengers. Encoding and decoding messages was one of its normal functions, and it always had kept records of messages transmitted by radio.

One of the radio weapons carriers was designated as the message center truck, a special 12-volt ignition system was obtained, and the base SCR-608 and SCR-284 radios were mounted in it. This incidentally freed the command car, which had been tied to the command post as a base radio, and allowed it to be used purely for transportation—a vital consideration.

The chief advantage is that the message center now has complete knowledge of all messages except direct telephone conversations and can more readily keep track of all available communications facilities. Secondly, a saving in men is effected.

Operations Section

The type of transportation allotted to the operations section made it difficult to displace this section by echelon, and for camouflage security it was generally necessary to park as large a truck as a GMC in the battery motor park at some distance from the CP. This was particularly inconvenient when one needed in a hurry the reserve supplies it carried.

The GMC was exchanged for the weapons carrier of the motor section and an extra light truck obtained from the battery, so now we can carry the operations personnel and equipment in two approximately equal parts. It would be desirable to substitute a 1½-ton truck for one of these vehicles. Owing to various restrictions, it is impossible to give here the complete transportation setup in this battery. The net result, however, is that the heavy transportation is relegated to the battery motor park while that which carries the purely CP elements is light transportation which can generally be parked within a convenient distance. One operations truck normally remains partially loaded with the reserve equipment. The other is freed for miscellaneous use or to go forward with the advance CP.

Computers and Observers

The need for additional relief and replacement computers created another personnel problem, particularly since evacuations of key men take a heavy toll. This was solved by training in the fundamentals of computing three selected FDC radio operators and two truck drivers who were mathematically inclined, as well as the headquarters clerk. This can be done rapidly and simply, even in combat, if they learn that job alone without being confused with the other elements of FDC procedure; these can come later as needed. There is always the last reserve of battery instrument men in case of extreme emergencies.

With the increased importance of air versus ground observation in the terrain over which we are now operating, the newly authorized battalion forward observer (for medium battalions) and the battery motor officer have been assigned as air observers (the latter in combat only; in bivouac he resumes his normal duty). In this way we can keep two well-trained teams in the air in reliefs, with continual coverage if the situation warrants. If forward observers are necessary, and generally several are required when called for at all, they are drawn as heretofore from the firing batteries.

Two Sundry Points

In nearly two years of combat Headquarters Battery, for various reasons too numerous to state here, has always had to

have a battery supply truck. We have actually had it throughout the past and expect to in the future. If for no other reason, it is needed to carry part of the machine gun equipment and the personnel overstrength which is normally authorized.

Secondly, all the extra SCR-610 vibrator packs from the FDC and airplane sets are mounted in ¼-ton trucks. This reduces the load of extra equipment carried by the radio section, provides ready replacement of radio vehicles, and lends increased flexibility since in a special situation a radio can be slapped on a jeep in no time at all.

DISPLACEMENT PROCEDURE

In displacing forward, our system normally has been as follows. The battalion commander precedes his party by half an hour or so. The S-3 in the staff ¼-ton follows with the Bn Comdr's party, including air officer (who selects new fields), survey section, wire vehicle, and generally the advance CP truck (containing VCO, "B" Battery FDC radio, radio operator, computer, and a telephone operator). After the battalion order is issued the S-3 and Com O together locate the CP. If the firing batteries displace by echelon rather than by battalion, the first battery into the new position switches its gun position radio set to battalion channel (same as "B" Btry channel) and nets with "B" FDC radio. It changes back to its battery channel when its own FDC set arrives in the position from the rear CP. Communication between the two CPs is provided by the "B" FDC radio, the battalion commander's SCR-608 and Com O's SCR-610 for the forward echelon, and the base sets for the rear. If distances are too great there is generally someone along the line who can relay messages. When the rear batteries remain in position from which they can no longer fire, the rear CP truck is often released to go forward with the route markers.

The remainder of the battery left to displace then consists of radio and maintenance vehicles and wire trucks, one of which may have to remain to pick up wire. This echelon finally goes forward on word from the battalion executive upon receipt of instructions from the battalion commander (if movement is by battalion) or from the battery commander (if movement is by battery). The Air OP moves independently on orders of the air officer, as dictated by the situation.

This system of functioning has been most completely developed in our present campaign and has well proved its worth to us, particularly in the rapidly moving, fluid situations we have met. In practice it is simple and flexible. Other headquarters batteries, however, have different modes of operation which work equally well for them. Hence the explanation given here is intended purely as a suggestion; it naturally will not work for all like units because of the personal factors involved.

STOP STARTING TROUBLE

Winning a race may depend on getting off to a good start. So may winning a battle! For winning a battle depends a lot on having the right equipment in the right place at the right time. That's why maintenance of batteries is so important and why, as critical items, they must be conserved as much as possible.

Battery care isn't particularly hard work—it's mostly a matter of faithful checking for (1) cleanliness and (2) proper amount and condition of the electrolyte. A simple program of battery care involves the following steps.

First of all, the operator of a vehicle should learn that the practice of running down a battery with the starter when the motor won't "catch" is sure-fire ruination of the battery. If the motor won't start promptly there is something wrong, and the source of the trouble should be located and corrected before further starting attempts are made. The starter should *never* be engaged for more than 30 seconds at a time.

Keeping the battery clean is especially important due to the fact that fumes from the electrolyte cause rapid corrosion. This is a pretty steady process, too, inasmuch as the fumes are always there and a certain amount will escape through the filler cap vent holes at all times. The carrier, as well as the battery itself, must be kept free from dirt and corrosion, and corroded terminal connections should be cleaned and then protected with a fresh, thin coat of grease.

The cleaning process naturally involves checking of cables, vent caps, terminal bolts, and battery mountings to be sure they are secure. Any tightening should be done carefully to prevent damage to the battery case. Leaks should be watched for and corrected. All of these services should be performed at least once a week—sometimes oftener, under certain operating conditions.

Another check that should be made at least once a week is the hydrometer check of the electrolyte, which indicates whether the battery is properly charged. Also, wide variations in hydrometer readings of different cells indicate trouble, such as short circuits through separators, leakage of electrolyte through partitions between cells, worn plates in one or more cells, or badly contaminated electrolyte.

For servicing the battery distilled water is best, though water pure enough to drink will be found satisfactory. Acid should never be added except when the electrolyte has leaked or spilled out or when the battery has been over-flushed. Adding of acid to raise the specific gravity *does not* increase the battery charge, and it *does* shorten the life of the battery.

Naturally, the man who knows how batteries are constructed and how they work will be far better equipped to take care of them. So it's a good idea to be acquainted with the relatively new War Department Technical Bulletin, TB ORD 67, on storage batteries. This bulletin is easy reading. It tells how batteries are constructed, how they work, and how they are maintained. It also gives instructions on battery care under both hot and cold weather conditions. Its use, in conjunction with the instructions given in technical manuals for specific vehicles, will enable responsible personnel to do their part in conservation and maintenance of batteries. It will help them and their fellow fighters to "get off to a good start."

CORPS ARTILLERY GROUP OPERATIONS

By Col. Robert D. Schmidt, FA

AUTHOR'S NOTE

Elimination of the artillery regiment from the Division led to its logical and corresponding elimination from Corps and Army Artillery. There was in the Regiment too much overhead for two battalions: four and even more can be handled. Adoption of the Group allowed a flexible organization that could be constituted to meet any tactical situation. To all who have operated in combat it seems we are approaching the ultimate in the tactical handling of Field Artillery, and German prisoners have frequently verified the tremendous power of American artillery fire. As the group headquarters is here to stay, some notes on its functions in combat may help those more recently arriving in the combat zone.

It constantly must be remembered that the group was organized to facilitate tactical handling of the battalions attached to it, and not to absorb any of their functions. All efforts of the group commander and staff must be toward augmenting the efforts of the battalions and providing them with all possible assistance.

The group is a flexible organization, and as such can expect to have any type battalion attached. It is necessary to be completely familiar with all the weapons, ammunition, transportation, and Tables of Organization and Equipment of Field Artillery. Our headquarters has had armored, tank destroyer, and antiaircraft battalions attached, in addition to other weapons including 155-mm howitzers, 155-mm guns, 4.5″ guns, 8″ howitzers, 240-mm howitzers, and 8″ guns. The capabilities and limitations of all must be understood. The success or failure of a group headquarters depends on an intimate knowledge of all these factors.

RECONNAISSANCE

Reconnaissance is one of the important means of assisting the battalions. It falls naturally into the tactical capabilities of the group. When the situation is relatively static it is possible for the group to make preliminary reconnaissance for the forward displacement of battalions, when necessary. When movement is rapid, however, the group headquarters can execute only sufficient reconnaissance to eliminate tactically unsuitable areas and to direct battalion reconnaissance into areas suited to their particular weapon.

The group also must coordinate reconnaissance with higher headquarters to assure of no interference with other installations. If this is not done, all units go after the best area and nothing but confusion results. Here again knowledge of the assigned weapons controls. Howitzers can occupy positions untenable by rifles; larger calibers cannot travel on roads lighter units can utilize.

A previous map study of terrain can appreciably assist reconnaissance. Cooperation between battalions is vital. Frequently in this group, battalions have given up good areas to other battalions when they found them to be more suitable for other weapons within the group.

OBSERVATION

Ground

The group S-2 must coordinate ground observation so that a complete coverage is obtained of the sector in which the group is operating. Zones of observation should be assigned to the battalions. Reports from these observation posts must be sent back, and frequently they are the source of vital information. In case Air OPs are inoperative, due to high wind or other causes, the ground OP is vital and should be established whenever possible.

Air

When the situation becomes fluid and movement rapid, adequate ground observation becomes too difficult to maintain. Air OPs then become the sole means of observation. In the opinion of many artillerymen the "Cub" is the greatest single contribution to the field artillery in history. We have rarely been without observation. They have flown in all kinds of weather and, on occasion, at night. When they can't see, usually a ground OP cannot either.

It has been our experience that a single field for the group airplanes is most satisfactory. It has been under the group air officer who is responsible for its administration, as well as tactical functioning. He must keep abreast of the situation and make reconnaissance forward for new fields. We have maintained telephone communication with the field where possible, or radio by means of a SCR-284. It must be remembered that it is practically never necessary to have the field so close that it can be shelled. There have been too many disastrous results from too forward locations. Also, these planes are strictly for artillery observation—and unless they are not needed at the time for that, should not be used for joy riding. If there are other needs, the Tables of Equipment should be so amended and artillery Air OP planes *not* be so used.

All S-2 and S-3 reports, as well as changes in no-fire line, must be sent to the field. A remote control system in the group CP must be kept operating so planes can be given the latest information when they check into the net.

Nothing in this section must be construed as taking control of planes from the battalion commander. Our battalion commanders have been pleased with our operation. They have learned that other pilots and observers can adjust their fire as well as their own. They do know, however, that they can call on their own plane any time they desire, but rarely do.

A continuous patrol has been maintained from dawn to dusk. With two planes from each of the battalions and the two group planes this can be done. With rapid movement our group has delivered withering fire on roads used by the retreating enemy. Destroyed materiel and vehicles on roads have been mute evidence of that—and it would not have been possible without continuous patrols during daylight hours.

When planes report into the net the group S-2 frequently assigns observation missions, such as an examination of areas reported to contain enemy installations. Preliminary reconnaissance of areas along routes of advance can also be provided, furnishing much valuable information for later ground reconnaissance.

LIAISON

Frequently the group is placed in direct support of one of the divisions in the corps. When such is ordered the group liaison officer reports to the Div Arty Commander concerned. This liaison officer must be constantly advised of fire possibilities

and all other information. He can be of tremendous help to the division, group, and corps artillery headquarters.

COMMUNICATIONS

Communications are one of the vital functions of a group headquarters. They are the means of tying all battalions not only to this, but also to higher headquarters. All battalions and group headquarters should be in a fire control net by means of SCR-284 or SCR-193 radio so that the corps and group FDCs can call on any battalions for fire in an emergency.

The group communications officer must insure continuous wire communication with the battalions. He must assure the dissemination of all information to the battalions, including complete instructions on radio. When new battalions are attached, he must be sure that all crystals are available for their use. All information on codes and changes must be given them promptly. SOPs of higher headquarters must be distributed to battalions and kept up to date. Detailed radio procedure is not discussed here: it differs somewhat in all headquarters, but the important thing is to keep all headquarters promptly advised of changes.

REPORTS

Make written reports as limited as possible for the battallions. We have never required anything but verbal S-2, S-3, and ammunition reports. They are consolidated and checked at the group headquarters and sent forward to higher headquarters. Prompt reports on completion of missions, particularly counterbattery, must be demanded of the battalions. This is by telephone and passed on immediately to the corps counterbattery officer.

SUPPLY

While the group is not an administrative headquarters, a knowledge of the supply and equipment in the battalions is vital to their proper handling. The group S-4 is charged with the responsibility of keeping in close touch with this. For this reason, the artillery ammunition report, monthly small arms expenditure report, G-4 weekly report, and quarterly materiel status report for higher headquarters should be submitted though group headquarters so that the S-4 is aware of supply and equipment problems and consequently in better position to be of help. Frequent inspections should also be made by the S-4 to assure that every effort is being made to procure necessary items. Sometimes it is assumed items cannot be procured, when a little effort will provide them.

The group S-4 must keep battalions constantly advised as to supply points, water points, and supply routes. This helps battalions in selecting positions for their rear echelons along convenient routes of advance and supply.

SPECIAL SERVICE

A Special Service Officer is on the group staff. All special service equipment and supplies are distributed by him, and at such times as entertainment is available and possible he contacts the higher headquarters to assure that it is made available to the battalions. As an assistant S-3 he also functions in the FDC.

DENTISTS

There are two dentists assigned to the group. It has been found most satisfactory to have them set up at the battalion rear echelons. From there they can visit the batteries with the battalion surgeon to make surveys, and the troops then are rotated back for treatment as convenient.

CHAPLAINS

The two assigned chaplains have their own transportation and are self-contained. They should spend most of their time with the attached battalions and coordinate their visits between them, always advising the group headquarters of their location. The chaplain's place is with the men of the battalions, as close contact with them makes for confidence and furtherance of good morale and spiritual guidance.

* * *

This discussion assumes operation under corps control. Frequently a group may be placed on a separate mission with a division, in which case some of the corps responsibilities (such as counterbattery) must be assumed by the group headquarters. In such an operation it may be advisable to attach a battery of the observation battalion to the group headquarters.

So far as positions are concerned, keep corps artillery well forward. Don't use up longer range behind our own lines. When a breakthrough occurs, crippling blows may be delivered on enemy traffic on roads. With Cubs in the air and positions well forward, corps artillery can be of great assistance in keeping the enemy moving and allowing him no opportunity to stop.

Finally, the group commander and staff must never forget those fundamentals necessary to success in combat. The highest of standards must be demanded of attached battalions in such matters as discipline, military courtesy, and sanitation. Training must be carried on when in combat, as well as when out of combat. Actual battle participation has a tendency to make some men careless—and nothing can be so disastrous to the field artillery. Nothing short of perfection is good enough, in all functions—and constant checking and training is the means to that end. The artillery has earned a high place in this war and it has done so by insisting on accuracy and minute attention to all details. This must be maintained, as anything else can easily result in death to our comrades in arms.

CONSTANT SERVICE — YOUR ASSOCIATION'S AIM

From deep in the Southwest Pacific a battery commander writes:

"We wish to thank you for your prompt attention to the JOURNALS. The entire group of issues, from April to date, arrived today.

"In the period between my original letter and receipt of yours, the Pony Edition started arriving. The time involved seems to be much less, as most small editions prove.

"THE FIELD ARTILLERY JOURNAL is eagerly awaited, and read with interest in my Battery Day Room, as well as being a definite help in suggestions to all officers in the battery."

FD Technique for Heavy Artillery

By Maj. C. R. Oliver, FA

Because of the practice of widely dispersing pieces within the battery the problem of controlling the sheaf has become a serious one. The problem can be partially solved by the use of convergence tables and can be totally solved by the use of the Sands graph. However, the corrections obtained by these methods can not be readily checked by the S-3 or by his assistants and, because of the several independent operations involved, are subject to numerous errors.

The fire-direction technique outlined below is not proposed as a universal one, but rather for use when normal fire-direction methods will not produce satisfactory data. It is particularly applicable to heavy artillery where accurate data are essential.

Survey

Locations of all pieces must be plotted on the firing chart. Time available and accuracy desired will decide whether each piece is located by survey or whether only one piece of each battery is located by survey and the remaining pieces of the battery paced in by the battery executive.

One piece, henceforth called the battalion base piece, is laid on the base point. All other pieces of the battalion are laid parallel to the battalion base piece. When a common orienting line is used all batteries will be laid with the same base angle. If more than one orienting line is necessary, only the differences in the directions of the orienting lines have to be considered in computing the base angles.

Firing Chart

The firing chart is identical with that used in normal fire-direction procedure, with the following exceptions:

(1) The locations of *all* pieces are plotted on the chart.

(2) Only the base line of the battalion base piece is drawn on the chart.

(3) Along this base line a point is arbitrarily selected, marked, and labeled "Data Point." The data point should be as near the center of the battalion area as possible. The battalion base piece itself may be used as the data point. When the data point has been selected, the range-deflection fan is seated at it, and an inverted arrow is placed on the base line ⅛ inch beyond the deflection are which is to be used in measuring shifts.

Fig. 1 shows the essentials of the firing chart.

The Templet Blank

A blank templet is made from a rectangular piece of transparent celluloid, about .005 inch thick. One side should be frosted to facilitate writing thereon. If frosted celluloid is not available the clear issue celluloid may easily be frosted with sandpaper. Tracing paper or cloth is a usable substitute for the celluloid. The templet blank should be only large enough to insure its covering any position area plotted on the firing chart.

A series of parallel lines are drawn along one edge of the piece of celluloid. Spacing between the lines is immaterial, but it should be regular. Sufficient lines should be drawn to insure coverage of a complete grid square on any probable firing chart.

Three pieces of masking tape are placed on the templet blank to hold it in place once it is oriented on the firing chart. Should masking tape be unavailable, adhesive or scotch tape may be used. Covering the edges of the masking (adhesive) tape on the templet blank with scotch tape prevents the range-deflection fan from catching on them, and consequently facilitates measurements.

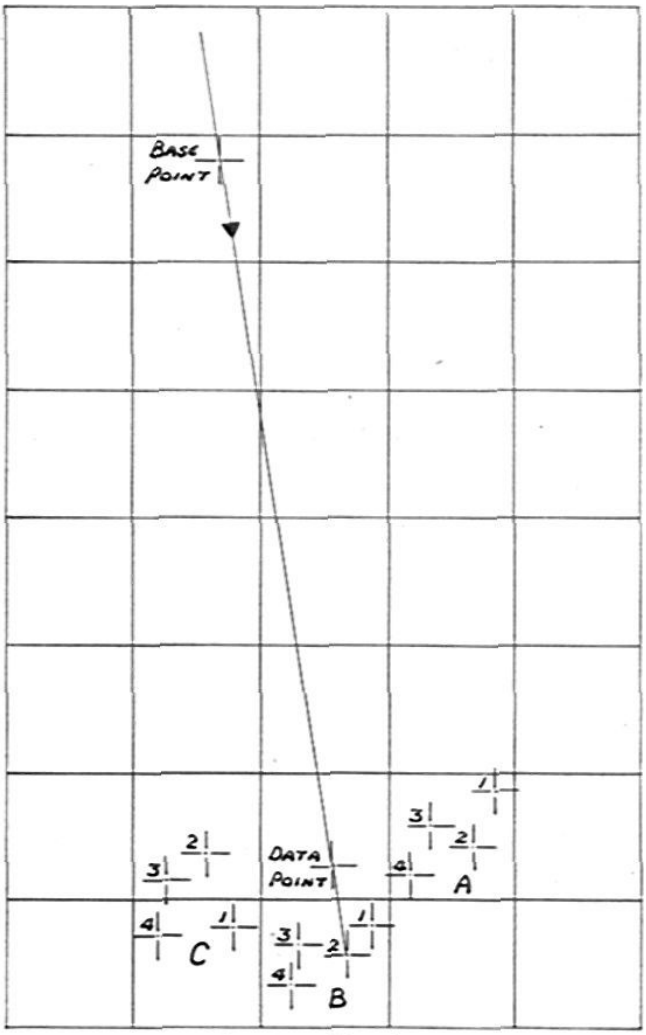


Figure 1. Firing chart.

Fig. 2 illustrates the completed templet blank. (Note: The masking tape, shown in this figure, is omitted in other illustrations.)

All essential data for any position occupied is placed on the templet in pencil in order that it may be easily erased, leaving the templet blank ready for the next position. Once the templet blank has been prepared its usefulness is practically unlimited.

Preparing the Templet

When the firing chart is complete (Fig. 1), the templet blank is placed over the position area so the lined edge of the blank is toward the target area and the lines on the templet are parallel to the grid lines (Fig. 3a). The blank is secured by the masking tape, and the positions of all pieces and of the

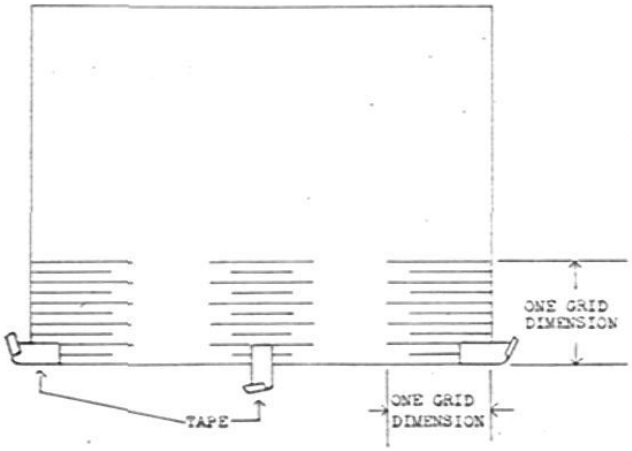


Figure 2. Templet blank.

data point are pricked through onto the templet. Locations of the pieces are marked on the templet using fire-direction color scheme, that is, Btry A in red, B in black, and C in blue. The position of each piece is labeled so when the templet is rotated through 180º (causing the lined edge of the templet to be toward the position area) the lettering may be easily read.

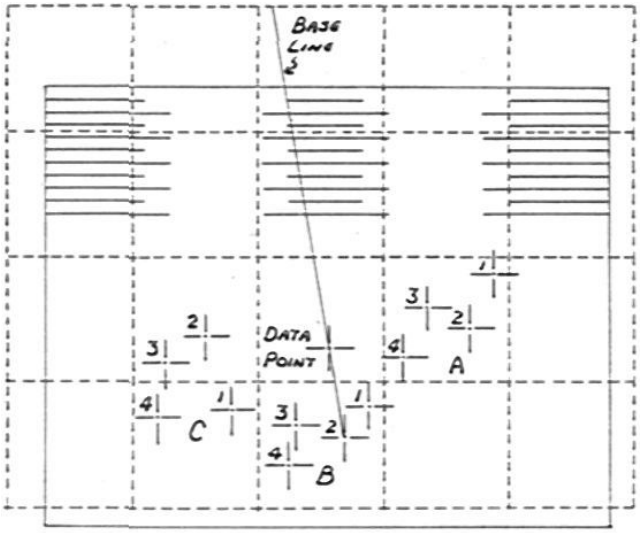


Figure 3a. Preparation of the templet: templet blank oriented over position area. (Note: Grid lines are shown as broken lines.)

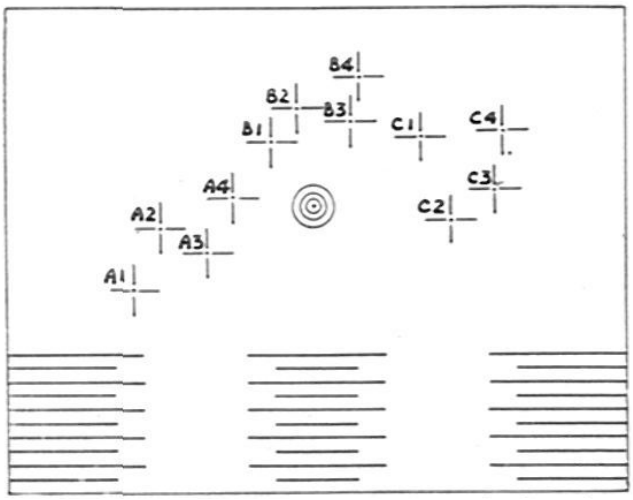


Figure 3b. Preparation of the templet: the completed templet.

Three concentric circles are drawn around the data point on the templet. The respective radii of these circles are 50, 100, and 150 yards at firing chart scale.

Fig. 3b illustrates the completed templet.

USING THE TEMPLET

All measurements, both range and deflection, for all pieces to any target are made with the range-deflection fan seated at the chart location of the data point. Deection shifts are measured right or left of the base line drawn on the chart.

Targets are plotted on the firing chart in the usual way. The manner in which the templet is used is dependent upon the nature of the target.

Target Requiring a Converged Sheaf

The templet is placed on the chart, lined edge toward the position area, with the templet data point over the target. A pin stuck through the data point and into the target facilitates the placing of the templet. The templet is then rotated until the lines on it are paralled to the grid lines. When it is thus oriented, it is secured by the tape. Fig. 4a illustrates the templet oriented to furnish data which will result in a converged sheaf on target 1.

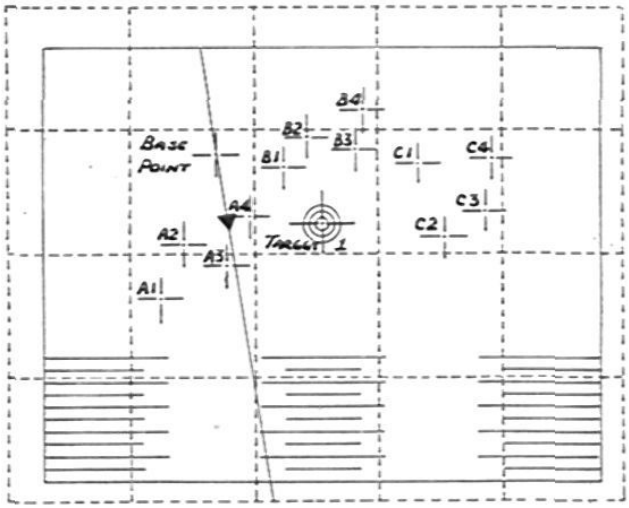


Figure 4a. Templet oriented for measurement of firing data: all pieces converged on target.

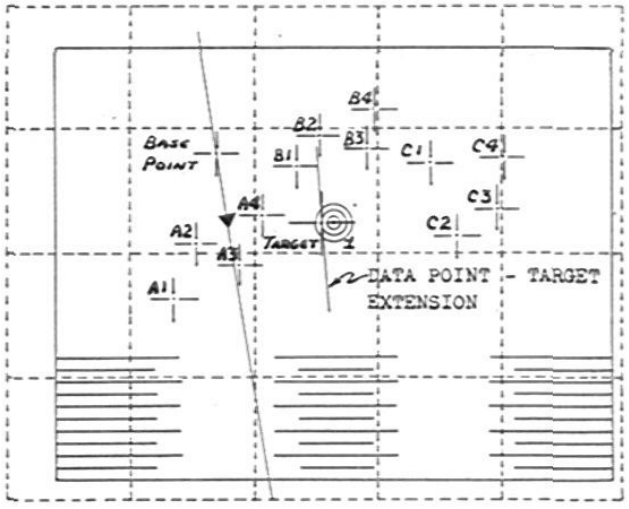


Figure 4b. Templet oriented for measurement of firing data: all pieces converged 100 yds. right of target.

A pin is placed in the templet location of the number one piece of Battery A (A1) and the range and deflection to the pin are measured and announced. The pin is moved to A2, A3, A4, B1, B2, etc., the ranges and deflections being measured and announced for each piece in turn. The data thus obtained will lay each piece on target 1.

Target Requiring an Open Sheaf

It is evident that when data are measured to the templet location of a piece, such data will serve to lay that piece on the spot where the templet data point is located. In firing with an open sheaf it is desirable that all pieces initially be converged half the width of the open sheaf to the right of the target. To accomplish this the templet data point must be half the width of the desired sheaf to the right of the target when the measurements are made.

The templet data point is oriented in the proper position as follows: The range-deflection fan, seated at the chart data point, is moved until one edge passes through the target. A short line through the target is drawn along this edge. The templet is placed on the chart, lined edge toward the position area, so the left are of the appropriate circle (50-yard radius for 100-yard sheaf, 100-yard radius for 200-yard sheaf, or 150-yard radius for 300-yard sheaf) is tangent to the line through the target at the target, and so the lines on the templet are parallel to the grid lines. When it is so placed, the templet is secured with the tape and the measurements made as previously described. The resulting data will converge all pieces the proper distance right of the target, and only an opening command on No. 1 piece is necessary to obtain a properly centered sheaf. Fig. 4b shows the templet oriented to furnish data which will converge all pieces 100 yards right of target 1.

Targets Which Can Not Be Covered with Either Converged or Open Sheaf

Certain targets such as roads, streams, barrage lines not perpendicular to the line of fire, etc., can not be satisfactorily covered by firing with either an open or a converged sheaf. Such targets require that individual measurements be made from each piece to that piece's assigned portion of the target. To do this the templet is shifted between measurements for each piece to place the templet data point over the desired location of each burst. The templet is oriented each time with the lined edge toward the position area and the lines parallel to the grid lines. Since measurements for only one piece are made each time the templet is oriented, it need not be secured with the tape.

SPEED AND ACCURACY OF THE TEMPLET

Limited tests were run to check the speed and accuracy with which data could be obtained by the templet. Although the tests were conducted by officers, it may be reasonably assumed that a trained HCO, accustomed to working with the range-deflection fan, could materially reduce the times and probably improve the accuracy obtained by the officers.

In 864 measurements the average variation from computed deflections was slightly less than one mil, and the average variation from computed ranges was slightly over 17 yards. Only three gross errors were made in the 864 deflection shifts measured.

Time taken during the test was from the completion of the plot of the target until ranges and deflections had been measured and announced for each piece of a 12-gun battalion. Average times were as follows:

(1) All pieces converged on target—3 minutes and 3 seconds.

(2) All pieces converged 100 yards right of target—3 minutes and 18 seconds.

(3) Each piece placed on appropriate portion of target, requiring that templet be shifted prior to each measurement—5 minutes and 25 seconds.

COMPARISON WITH OTHER METHODS

Use of individual chart data for each piece, as compared with measuring data for only one piece of each battery and having each computer determine and apply corrections:

(1) Allows the S-3 to check the majority of the data.

(2) Provides exact data and enables each gun to be laid on any desired point.

(3) Needs no elaborate preparations—all material used is issued.

(4) Requires very little additional training. Construction and use of the templet is nothing more than an elaboration on the construction and use of an overlay.

(5) Eliminates the necessity of computing convergence and sheaf-centering commands.

(6) Reduces number of deflection commands sent to the battery.

The most obvious method of determining individual chart data for each piece is, of course, to draw a base line extension for each piece and measure the range and shift with the fan seated at the piece. This method results in confusion because of the multiplicity of base lines and because the fan must be reseated prior to each measurement.

Individual chart measurements may also be obtained by constructing a line through each target parallel to the base line, seating the range-deflection fan at the target, and measuring shifts (from the constructed line) and ranges to pins placed in the chart locations of each piece.

Both of the above methods were tested on the charts used for the templet test. The data obtained by the templet were more accurate and produced far fewer gross errors than either of the other two methods.

THE HCO

The procedure employed by the HCO in obtaining chart data for the various pieces has been discussed above, but no mention has been made of two other important operations performed by him.

Deflection Corrections

Corrections are computed and placed on the fan in the normal manner. If the target being fired upon is an area target, one correction for the entire battalion should provide sufficient accuracy. When such is the case, the HCO would read the battalion correction for the apparent mean range of the battalion. If the target being fired upon is a point target requiring additional accuracy, the HCO should read individual corrections for each piece, reading and announcing the correction at the same time he reads and announces the range and deflection for the piece.

Replot of Target

The data used for the replot are normal adjusted data. HCO, using this data, would plot the point with the fan seated at the chart data point. The templet would be oriented on the chart so the templet location of the adjusting piece was over the plotted point. The templet data point would then be over the chart location of the target.

THE VCO

At ranges in excess of 10,000 yards, large variations in range are necessary to produce an appreciable change in site. Consequently, at medium and long ranges the heavy artillery VCO's operations normally will not be affected by echelonment of pieces in depth and he will compute and announce sites for each battery in the usual manner.

If the altitudes of the pieces vary materially, it probably will be desirable to compute individual sites for each piece. To facilitate such an operation a table should be prepared showing site differences at appropriate ranges between one piece of the battery and the remaining pieces of the battery. The piece upon which the site differences are based should be selected, if possible, so its ranges will approximate mean ranges for the battery. The VCO computes the site for the selected piece to the target and applies the differences from the table to arrive at sites for the remaining pieces of the battery.

THE COMPUTER

Computers' duties differ from those in the normal fire-direction procedure mainly in that data are furnished to each piece instead of for the battery as a whole. Duties of the computer are illustrated in the following example of a mission fired by a 155-mm gun battalion:

(1) Upon receipt of the mission the S-3 inspects the target plot, orders the HCO to furnish data for a 200-yard sheaf using one correction for the entire battalion, and issues the following fire-order: "TRANSFER FROM BASE POINT, TIME FIRE, NORMAL CHARGE, CONCENTRATION 1, BATTALION THREE VOLLEYS, ONE C APART, 200-YARD SHEAF, AT MY COMMAND."

(2) The HCO, having oriented his templet to obtain data which will converge all pieces 100 yards right of the target, measures and announces data as follows (consider Btry C only):

"Corrections, all batteries, L 13;
Charlie one, 10550, R 367;
Charlie two, 10860, R 372;
Charlie three, 11070, R 400;
Charlie four, 11310, R 415."

(3) The computer records the above data as shown on the computer's form in Fig. 5. A suggested sequence of computations and commands is:

(*a*) Fire commands through "Corrector 30" are sent to the battery immediately following the fire-order.

(*b*) Map shifts and corrections are combined to get the total base deflection shifts (Fig. 5, under COMPUTATIONS).

(*c*) Map ranges and the spread are combined to get the total ranges (Fig. 5, under COMPUTATIONS).

(*d*) With the GFT properly set, the time corresponding to the total target range of No. 1 piece is determined, announced to the battery, and recorded (Fig. 5, under FIRE COMMANDS). While the indicator of the GFT is set in this position, the elevation for No. 1 piece is determined and recorded (Fig. 5, under COMPUTATIONS). This process is repeated for each piece.

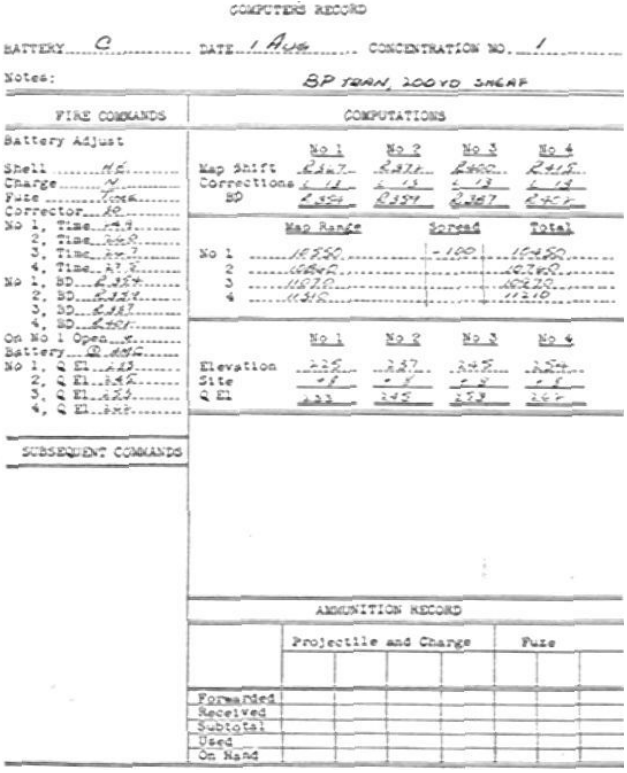


Figure 5. The computer's record.

(*e*) When the times for each piece have been announced, the base deflections shifts previously computed are announced to the battery and recorded (Fig. 5, under FIRE COMMANDS).

(*f*) The amount of opening is computed based on the approximate mean range of the battery to the target. It is announced to the battery and recorded (Fig. 5, under FIRE COMMANDS). A table, of which an extract appears below, facilitates determination of the amount of opening.

100-Yard Sheaf		*200-Yard Sheaf*		*300-Yard Sheaf*		*On No. 1*
From	*To*	*From*	*To*	*From*	*To*	*Open*
3500	3900	7000	7850	10500	11800	9
3900	4450	7850	8900	11800	13350	8
4450	5150	8900	10300	13350	15450	7
5150	6050	10300	12100	15450	18150	6
6050	7400	12100	14800	18150	22200	5

Note: This table is based on true ranges. If an offscale chart is used the ranges must be modified by the chart-ground relationship.

(*g*) The number of rounds and method of fire, recorded from the fire-order, are announced to the battery.

(*h*) The site is obtained from the VCO and recorded (Fig. 5, under COMPUTATIONS). Sites are combined with the elevations, and the resulting quadrant elevations are announced to the battery and recorded (Fig. 5, under FIRE COMMANDS). In this example variations in altitudes of pieces were negligible so only one site (+ 8*mils*) was computed for the entire battery.

With weapons not firing with quadrant elevation, the computer's record would be modified to include a site command for each piece and exclude the computation of quadrant elevation.

Prearranged fires arranged in series and groups on tactical localities will add flexibility to your fire support.

TANDEM HITCH

REPUBLISHED BY COURTESY OF "ARMY MOTORS"

The ¼-ton jeep is about to blossom out as a full-blown prime mover for the 105-mm howitzer and similar pieces of heavy equipment. Not one jeep but two jeeps, hooked together by means of a new *tandem hitch*, will do the job formerly the exclusive business of the 2½-ton truck.

The tandem hitch (Fig. 1) has been allotted to certain Field

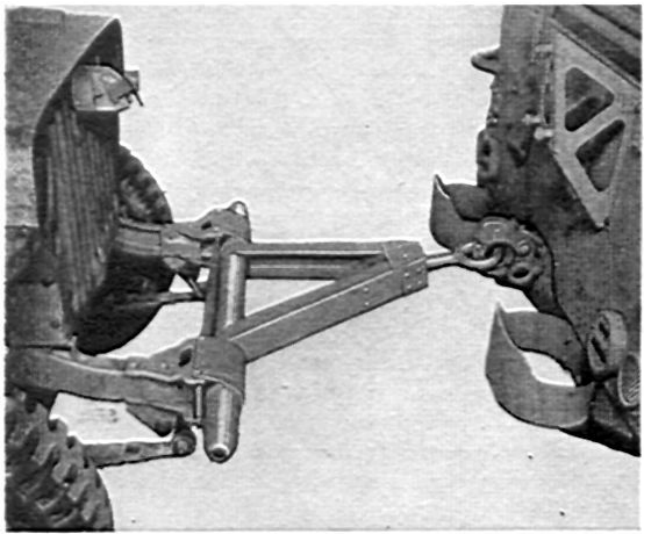


Figure 1. The tandem hitch becomes a permanent part of the jeep, replacing the original bumper (salvage it).

Artillery, AA, Airborne, and other units on T/O&E's. It is now available in kits to units authorized to get it by their T/O&E. Requisition *hitch, tandem for ¼-ton 4 × 4 truck, Fed. Stock No. 8-H-1825*. Any questions on issue or availability of the kit can be answered by the Tool and Equipment Distribution Unit, St. Louis Ordnance Depot, St. Louis, Missouri.

Installation instructions on the hitch come with every kit. Installation takes less than an hour; here's about what you do: Since the hitch includes a special bumper, take the present bumper off your jeep and throw it into salvage. Place the tow bar and frame bracket assembly of the hitch in position over the frame bumper gussets and, using the nuts and bolts that held the old bumper, hook up the hitch.

To keep the hitch up out of the way when the jeep is used solo, the kit contains a bracket (Fig. 2) which attaches to the jeep's grill.

Because the loads that will be towed with the new tandem set-up put an extra strain on pintle hooks, the pintle hooks of all jeeps hitch-equipped, must be reinforced. The kit contains a reinforcing plate.

Driving in tandem calls for extra care. Besides learning all the tricks of maneuvering, the driver must give strict heed to this caution plate plate which comes in the kit for installation on the instrument panel.

Last but not least is a caution plate for the driver. Mount this on the instrument panel. The caution plate warns the driver not to go over 30 mph in tandem over level ground, and not over 10 mph downhill. At the time the hitch was tested, two tandem-hitched jeeps towing a 105 howitzer down a 10% grade, were speeded up to about 20 mph. The first thing the driver of the lead vehicle knew, his jeep was swerving wildly from side to side and suddenly flipped over into a ditch. The towed howitzer went into a sideslip, turned butt over wheels and upset the second jeep. In other words, two jeeps are friskier than one and you'll have to learn to drive them in tandem. A couple of tips: in applying the brakes, apply the brakes of the second jeep first. Also, the turning radius of tandem and towed load is about 37 feet.

The drawbar of the new hitch is good for pushing, say for pushing stalled jeeps. A hitch-equipped jeep can also be towed by means of the drawbar—although you've got to be careful in choosing your towing vehicle. For one, the jeep cannot be towed behind the 2½-ton truck because the height of the 2½-ton's pintle will allow the jeep to run under it.

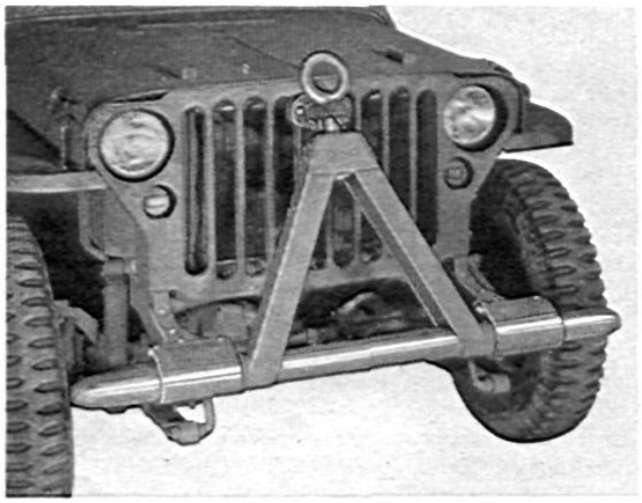


Figure 2. The hitch is no handicap when the jeep is used solo. Just tuck it up out of the way—the grill bracket will keep it from flopping all over the road.

What are you doing to encourage the infantry to follow your fire more closely?

Do you know how many birds there are in the covey and the number of machine guns that are in the enemy infantry battalion?

Are you constantly familiar with how your guns are shooting, and are you correcting them so they will shoot together?

Are you constantly observing your fires so as to eliminate ineffectual ranges?

CHICKENS GO HOME TO ROOST

Seized on a train near Verdun, a 10-cm K 18 is fired toward Metz by the 344 FA Bn of the 90th Div.

Captured near Verdun, this 15-cm S.F.H. 18 gets a coat of GI paint before being put into service near Metz.

Captured 155-mm ammunition was fired for the first time from American guns on 16 Oct 44, in a test by a First Army artillery battalion attached to the 3d ("Spearhead") Armored Division. This was the 991st Field Artillery Battalion, once the 2nd Bn of the 258th FA, the "Washington Greys." Incidentally, on 10 Sep 44 the 991st placed our first artillery fire on German territory.

This ammunition had been captured in various dumps through France and Belgium. The M-12 is the only American weapon that could fire it. Earlier in the campaign captured ammunition had been used, but it was fired from German pieces. An interesting chain of circumstances made possible this use of German ammunition in our own guns.

During World War I the French gave their American allies permission to manufacture 155-mm guns identical with their own GPF (*Grand Puissant, Filloux*—Great Power, Filloux—named after the French Col. Filloux who designed the weapon). Many were produced in the United States, especially at the Watervliet (N. Y.) arsenal.

In 1942, after the 155-mm gun M1A1 (the so-called "Long Tom") had supplanted the GPF in our artillery, the GPF tube was mounted on a modified Sherman tank chassis and designated the "M-12, 155-mm gun, motor carriage." First used in Europe in Normandy, the M-12 has proved itself enormously successful in conjunction with armored forces.

When the Nazis overran France in June, 1940, they took over a huge stock of French materiel, among it French 15.5-cm guns and ammunition. The latter would not function in "Long Tom" because of difference in rotating bands, but were ideal for the M-12s.

Since it was first committed in Normandy on 13 Jul the 991st has not been out of action a single day. In mid-August it was attached to the 3d Armd Div, and participated in the mad dash through France and Belgium. More recently its Battery C was attached to the 1st Div for the assault on Aachen, where its performance was outstanding.

8.8-cm PAK 43 turned against its former owners near Metz on 29 Sep 44

PERIMETERS in PARAGRAPHS

(BASED UPON LATEST INFORMATION AVAILABLE AT DATE OF WRITING, AND SUBJECT TO CORRECTION AS MORE COMPLETE REPORTS ARE RECEIVED.)

By Col. Conrad H. Lanza

ALLIED ATTACK AGAINST WESTERN GERMANY (17 Sep to 18 Oct 44)

At the beginning of the period the Allies were everywhere opposed by strong hostile forces. They were also confronted with the approach of winter. Commencing at the end of September European skies become overcast for more than half the time. Air observation is often impossible, while ground observation is hampered by frequent mists and drizzling rains. While this condition affected both sides, it prevented the Allies from fully utilizing their overwhelming air forces.

Allied lines of communication were long. According to statements released from London, between two and three million troops had been landed in France. Adding thereto the French contingents, not far from 3,000,000 men had to be supplied. Little could be obtained locally—in fact, it was necessary to provide substantially for the French people.

Supplies could be landed at Cherbourg, which had been reconditioned and restored to use toward the middle of September. The greater quantity, however, had to be landed over the beaches of Normandy. Winter is usually accompanied by stormy weather, which could be expected to hamper unloading of supplies on beaches. In partial efforts to prevent this happening an artificial port had been constructed near Avromanches by the British, formed by a breakwater of sunken ships in rear of which piers had been built. There had been two such ports, but one had been destroyed by a storm in June.

It was evident that if the enemy's lines were strong, they would become more so the more time he had to strengthen them. It was therefore desirable to break these lines before the winter started in.

The front at this date was

south border of Holland from the North Seat to Antwerp (Allies)—Cappellen (German)—Turnhout (A)—Schelde and Meuse Canal—Beek (A)—Heerlen (A)—Aachen (G)—Stolberg (A)—Malmedy (A)—St. Vith (A)—Pruem River—Our River—Mosel (Moselle) River, with German bridgehead at Metz and Allied BH just south thereof—Pont-a-Mousson (?)—Nomeny (G)—Chateau Salins (G)—Luneville (G)—Epinal (G)—Fougerolles (G)—Lure (A)—Pont de Roide (A).

Under Gen. Dwight D. Eisenhower, with headquarters in France, were:

21st Army Group (Field Marshal Sir Bernard L. Montgomery):
- **First Canadian Army (Lt. Gen. H. D. G. Crerar) from the North Sea to near Turnhout.**
- **Second British Army (Lt. Gen. J. T. Crocker) from near Turnhout to Aachen area (exc.).**

12th Army Group (Gen. Omar N. Bradley):
- **First US Army (Lt. Gen. Courtney H. Hodges) from Aachen (inc.) to Metz area (exc.).**
- **Third US Army (Lt. Gen. George S. Patton) from Metz to Epinal area (both inc.).**

6th Army Group (Lt. Gen. Jacob L. Devers):
- **Seventh US Army (Lt. Gen. Alexander M. Patch) south of Epinal to vicinity Lure.**
- **First French Army (Maj. Gen. Jean de Lattre de Tassigny) south to Swiss frontier.**

In GHQ Reserve were

First Allied Airborne Army (Lt. Gen. Lewis H. Brereton).
- **Ninth US Army (Lt. Gen. William H. Simpson) (also charged with detached operations against enemy-held ports in France).**

GHQ decided to break the deadlock along the front by a maneuver intended to pierce the enemy's lines. There were various possibilities. An advance intended to penetrate south of Metz would encounter first the Vosges Mountains, then the Rhine, then the mountainous Black Forest. Several attacks so far had failed to get across the Vosges foothills. An attack through Metz and Trier would be promising. To start this it would be necessary to reduce the fortress of Metz. This would probably take much time. An attempt to take it by a swift attack had failed. The same situation existed at Aachen. Between these two places were the Ardennes, a rough country with relatively few east and west roads and railroads.

North from Aachen the terrain was generally flat. The enemy held the Meuse and Rhine Rivers. If these could be crossed, the way would seem to be open for a dash into the great industrial region of the Ruhr. In fact it might continue by daily extended marches right on into Berlin. It would be necessary, however, first to cross the rivers.

The decision was to adopt the latter course.

BATTLE OF THE DUTCH SALIENT

The plan:

First Airborne Army would on D-day drop one division each at the bridges near Arnhem and Nijmegen, to seize and hold them intact. A third division would be dropped near Eindhoven, to prevent German troops from being sent northward against the divisions at the bridges.

Second British Army on D-day would attack with strong armored spearhead along the road Eindhoven—Grave—Nijmegen—Arnhem, relieving the airborne troops as it moved forward. It was to be prepared to move further forward in accordance with orders to be issued later.

The road assigned to the Second British Army, including the bridges indicated, is a 4-lane hard surfaced highway. South of the Meuse River its top is about 6 feet above the adjacent fields, which were flat, partially inundated, and unsuitable for motor vehicles. Vehicles traveling along this road were excellent targets for batteries or infantry concealed in towns or woods.

D-day was 17 September. During the morning hours the 8th US Air Force attacked over a wide area in Holland. Special attention was given to AA batteries in locations dangerous to contemplated landings. Enemy lines of communication leading toward the areas to be landed in were heavily bombed. No air opposition was met; there was a limited ground reaction; only 2 bombers were lost. The day was grey and cloudy, which favored the offensive, as planes were not visible from the ground until they came to low altitudes near the targets.

Shortly after noon the First Airborne Army started to drop troops as follows:

101st US Div (airborne) between Tilburg and Eindhoven, with mission of stopping northbound enemy movements at Eindhoven and seizing and holding the bridge at Grave.

82nd US Div (airborne) in vicinity Nijmegen, to seize and hold the bridge there.

1st British Airborne Div in vicinity Arnhem, to seize and hold that bridge.

None of the landings met other than minor rear area guards. Opposition did not last 30 minutes. The troops were able to reach their respective objectives, except the bridges at Arnhem and Nijmegen. Over 1,000 gliders and transport planes were used to bring in the landing troops from some 25 airfields in England.

While that operation was under way, the Second British Army started an artillery preparation which extended over the front from opposite Turnhout to Maastricht—over 50 miles. The main effort was to punch a gap through which armor could advance from a bridgehead held north of the Schelde—Meuse Canal and just south

of Eindhoven, 15 miles away. This succeeded, the gap was blown open, and the armored troops got through.

The German High Command were quickly informed of the airborne landings. The decision was to concentrate against the furthest one, at Arnhem. Gen. Bittrich, commanding a corps in army reserve about 40 miles east of Arnhem, was given the mission of securing Arnhem. No special steps were taken to recover the other bridges, other than to alert troops in the vicinity and organize as many as possible to attack the flanks of the British column which it was foreseen would follow the excellent highway through Eindhoven—Grave—Nijmegen—Arnhem. The limitation in German countermeasures was probably due to lack of troops.

On 18 Sep the Second British Army's armor pushed into Eindhoven and established liaison with the 101st US Div. There was considerable enemy opposition; a number of tanks were lost. All airborne troops received reinforcements and supplies by air. This met opposition from a detachment of 200 German fighters, who caused some losses.

The British armor pushed forward, reached Grave on the 19th, and relieved the 82nd US Div near Nijmegen on the 20th. By this time the Germans had initiated operations to cut the road in rear of the armored troops. An attack was launched on the front Heel—Best eastward toward Eindhoven and south thereof. On the same day Bittrich's force commenced an attack against the 1st British Airborne Div near Arnhem; it made some progress.

Now the British undertook an attack against the Nijmegen bridge. Nijmegen (about 60,000) is on the south side of the Waal River. It lies above the river on low hills. The bridge, which has 4 lanes, has its south abutment on a bluff (unusual for Holland) and about 70 feet above the river. The north side of the river is very low, and the road from the bridge descends on an embankment. At the Nijmegen end of the bridge is an old castle, center of the German defense. Woods just to the east afforded an opportunity to get close to the bridge. Early on the 21st the British captured the bridge practically undamaged. They then advanced northward toward Arnhem, having received information that the 1st British AB Div was being heavily attacked on the north side of the Neder Rijn River and needed aid.

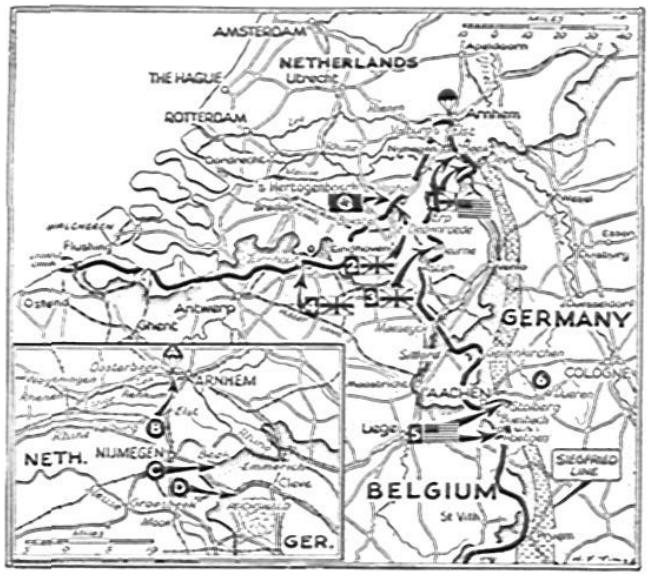
Arnhem is about the same size as Nijmegen and is similarly situated on what for Holland is high ground on the north side of the Neder Rijn, which is about 200 yards wide. The 4-lane road from Nijmegen runs through low country, partly subject to inundation. There are few trees: movements are visible for long distances in clear weather. It is 8 miles from Nijmegen to Arnhem. The British started north immediately.

Bittrich had detailed a flank guard to stop an advance from Nijmegen while he made his main effort against the British airborne troops, who had now withdrawn to a wooded area west of Arnhem and just north of the Neder Rijn. The flank guard stopped the British armor near Elst, just halfway to Arnhem.

Finding it impracticable to overcome the flank guard the British went around their right, and on the 22nd reached the Neder Rijn west of Arnhem and about opposite where the airborne troops were now holding out against strong German attacks. On the same day a German attack coming from the east secured the main line of communications near Veghel (halfway between Eindhoven and Grave) and established a road block.

On 23 Sep operations were initiated to reduce the block, while the forward troops were temporarily supplied by air. Major reinforcements were landed near Nijmegen. Troops pushed out to east and west and established a solid point of support. Other US forces were flown to near St. Oedenroede, 6 miles southwest of Veghel. These were attacked as soon as they landed overcame this, and pushed forward. They broke the road block at Veghel, but the road was not yet entirely safe as the enemy was close enough to direct fire at anything that moved on it. Under cover of the night reinforcements were rushed northward. It was impossible, however, to establish a direct connection with the troops north of the Neder Rijn, who were being compressed by enemy attacks into a constantly decreasing area.

On the night 26/27 Sep the British airborne troops worked their way to the banks of the Neder Rijn and by assault boats crossed to the south side. They numbered about 2,000. The Germans claim to have captured 6,450 prisoners, including abandoned wounded, and to have counted over 2,000 killed. This would indicate that the original force numbered some 10,500 men. This is in excess of T/O strength, but may be correct since considerable reinforcements had been flown in or dropped.



Although efforts to relieve the Arnhem pocket continued, there were indications the Allies struck eastward below that Lek River city (1). These sectors are shown on the inset. The pocket of airborne troops (A) received reinforcements from the British to the south (B). While American sky troops were fighting beyond Beek (C), British armor plunged across the German border and into the Reichswald (D). On the western side of the Netherland salient the enemy cut the road between St. Oedenroede and Veghel, but after five hours was smashed back (2). On the eastern side the British took Duerne (3). Near the Belgian-Netherland border they occupied Turnhout (4). American First Army troops not only repelled attacks east of Aachen but also made slight gains around Roetgen (5) and loosed a great artillery onslaught against the Rhineland, especially in the area of Dueren (6).

Thus ended the attempt to pierce the German lines and advance into Germany. While that mission was not accomplished, very substantial gains had been made. A salient—the Dutch Salient—had been driven 45 miles into the enemy's lines, separating his forces south of the Waal River into two parts. Bridgeheads had been gained over the Meuse and Waal Rivers.

Operations were now started to consolidate these gains and to widen the salient, which on 27 Sep with its head at Nijmegen had its west flank approximately parallel to and 11 miles west of the road to Eindhoven. The east flank extended to Gennep, thence along the west bank of the Maas (Meuse) River, less a German bridgehead near Overloon.

Most fighting since has been toward the east side, for an advance in this direction not only widens the salient but pushes toward Germany. Overloon was taken, lost, and retaken finally on 13 Oct. At this date the salient was 27 miles wide through Eindhoven and nearly a parallelogram in shape, with the north corners slightly rounded off.

BATTLE OF THE SCHELDE

The great port of Antwerp had fallen into the hands of the Allies almost uninjured. It would have made an excellent base—if it were unblocked. But the enemy had a block on the sea approach; besides, just north of Antwerp he was within 5 miles—within easy range. To clear up this situation was the mission of the First Canadian Army.

On the north side of the Schelde River the enemy held Walcheren Island and South Beveland. On the south side of the Schelde he held a beachhead which extended roughly to the south boundary of Holland and beyond to the Leopold Canal in this area. On both banks of the Schelde were batteries which covered the water approaches to Antwerp.

At the beginning of the period the Canadian Army was fighting daily to reach the Leopold Canal and then push on to the Schelde. The Germans made no serious attempt to defend that part of their beachhead east of the Grand Canal from Gand (Ghent) to the

In the area of Oostburg (1) Canadian units drove northward toward the beachhead held by their comrades. Other units crossed the Leopold Canal, took Watervliet and pushed on (2). Still others from the east (3) moved northwest around an inlet and joined beachhead contingents southeast of Biervliet. Although the Canadians' hold on the isthmus linking Zuid Beveland to the mainland was firm, the Germans forced them out of Woensdrecht (4) in strong counterattacks.

Schelde. Terneuzen (on the Schelde) was reached and occupied on 21 Sep. At the same time operations started north from Antwerp. By the 24th the line here was substantially the canal from Antwerp to Turnhour. The Canadians commenced to cross the canal next day.

This movement was slow. It took a week to reach Brecht, only 2 miles beyond the canal. On 3 Oct the line was 8 miles from Antwerp, which relieved that city of constant shelling. On the 4th Cappellen was taken. The right of this movement was able to take advantage of the Dutch salient, now well established, and to advance. The mission was to reach Tilburg, and troops were within 3 miles of that city on the 5th.

On 6 Oct. a strong attack was launched against the enemy's beachhead south of the Schelde and west of the Grand Canal. Very strong resistance was met. At the same time the attack east of Antwerp was continued.

The Leopold Canal is about 140 feet wide. The surrounding country is flat. Main point of attack was opposite the center of the beachhead just north of Maldegem. Some 25 flame throwers mounted on tanks threw sheets of fire across the canal. Infantry then crossed in assault boats on a front of 3½ miles. They were able in places to advance beyond the canal for 1,000 yards. The enemy was identified as the 64th German Div, estimated as 5,000 strong. The perimeter of the beachhead was 21 miles and its area 220 square miles. On the 7th German counterattacks, and their incessant artillery fire, forced a partial withdrawal of the Leopold Canal bridgehead to a depth of but 400 yards.

As the bridgehead made no further progress an amphibious expedition was sent from Terneuzen down the river, which landed during the night 8/9 Oct southeast of Breskens at the rear of the bridgehead. The landing got on shore without serious resistance. Immediately afterward it came under artillery fire from batteries on Walcheren. From this fire there was little concealment by day. To protect the troops the enemy batteries were heavily bombed. As these had been known of in advance, an earlier attempt to neutralize them had been made. RAF bombers from England had dropped 6-ton bombs against the dikes around Walcheren. The Walcheren sea dike is unusually massive, but the air force breached it at several places. The sea came in and did in fact flood the sites of about 7 enemy batteries.

On 10 Oct the hostile beachhead was attacked from both north and south. The attack east of Antwerp shifted its main effort to its left and reached the isthmus to South Beveland, thereby cutting the enemy's only land line of communications to that area and to Walcheren. Next day the Germans recaptured it.

Reinforcements were sent to the Canadian beachhead near Breskens. On the 13th the attack from the south alongside the Grand Canal reached Biervliet. On the 14th the Canadians enlarged their bridgehead across the Leopold Canal and retook the entrance to the isthmus to South Beveland. Air photographs showed that 2/3 of Walcheren was under water. Nevertheless, enemy artillery activity from that island continued.

On 15 Oct continuous all-day attacks by low flying planes were directed against the German 64th Div, still defending their extensive beachhead. Allied troops from the south made numerous attacks supported by armor.

Up to include 18 Oct slight advances were made by the Canadians toward Breskens.

The enemy supported his bridgehead south of the Schelde by water transportation. His wounded were moved out by Red Cross barges. Due to the distance of Allied airfields it was impracticable to maintain a 24-hour air barrage over the Schelde River. Walcheren was supplied by water transportation from the north side.

THE AACHEN CAMPAIGN

Through Aachen excellent railroads and multi-lane highways extend from the west, eastward into Germany. To the south is the rough Ardennes country, with few roads (none first class) and but one minor railroad in a west-to-east direction until the Moselle valley is reached, 75 air miles away. North from Aachen for another 75 miles there are two good lines of communication into Germany through Cleves at the north end, and at Roermond, nearly at the center. To capture either of these places it would first be necessary to force a crossing of the Mass (Meuse) River.

The First US Army had crossed the Meuse in its zone of action without opposition, and its leading elements had arrived at Aachen on 3 Sep. At that time the enemy occupied it only lightly; part of Aachen was seized. The enemy reinforced more rapidly than the Americans and recovered all of the city. In the first half of September, attacks on Aachen having failed, an operation to turn it from the south had been commenced. When this account opens this had reached the vicinity of Stolberg, between 8 and 9 miles ESE of Aachen.

On 19 Sep the Americans entered Stolberg. A street and house battle started. Armor was used in the city and around its flanks. It advanced 1½ miles beyond the town. The Germans had armor too, and used it rather lavishly. They counterattacked and infiltrated and had some flame throwers. It was a bitter all-day fight. A secondary attack north of Aachen made minor progress. Next day the Americans were 4 miles east of Stolberg (population about 20,000) but fighting in that city continued.

On the 21st the American attack on the north was 3 miles from Geilenkirchen, a small town 12½ miles from Aachen. The Stolberg street and house battle continued, while troops entered the Huertgen Forest southeast of the town. From advanced positions the American artillery fired upon Dueren, important road and rail junction. The situation temporarily stabilized, with Stolberg a center of activity until it was finally cleared of the enemy on the 24th.

The attempt to capture Aachen by envelopment from the south not having succeeded the First Army decided to attempt a similar maneuver from the north. According to German reports of identification of prisoners, American divisions south of Aachen were shifted to the new proposed zone of attack. This started on 2 Oct as a rather limited affair on a front of about 5 miles. The line of departure was east of Heerlen (just inside the Dutch frontier) and the objective was the line Uebach—Merkstein—Herzogenrath, three little villages across the frontier. It was splendid autumn weather. An air preparation was provided by 350 medium bombers followed by over 100 fighter bombers. Then followed a 2-hour artillery preparation. At 1130 hrs. the infantry jumped off. Just in front of the line of departure and parallel to it was the Wurm River, which is the boundary between Holland and Germany. Although designated as a river, it was only waist deep and but 12 feet wide and was everywhere fordable. A hundred yards beyond was a railroad and beyond this the enemy's wire, which had been cut by the artillery. Enemy pillboxes had also been destroyed. It was found that many were dummies, intended to divert artillery fire from the real targets. With some difficulty the infantry advanced about a mile.

Next day the enemy forced the American left back across the frontier. The right made some advance toward Merkstein. During the night 2/3 Oct the artillery fired a new preparation, and on the morning of the 3d the Americans recrossed the Wurm River and stormed on into Uebach. Here there was another hot street and house battle. This offensive was continued daily and made steady small gains in very severe fighting. On the 6th Beggendorf, 3 miles

southeast of Geilenkirchen was reached—an advance of 4 miles from the original line of departure in 5 days.

New American attacks were now directed to establishing a base facing southward toward Aachen. On the 7th the front was extended to the line Beggendorf (inc.)—Alsdorf (exc.). Both sides were using numerous tanks; artillery activity was high. Air action was mostly by the Allies, but German planes were by no means absent.

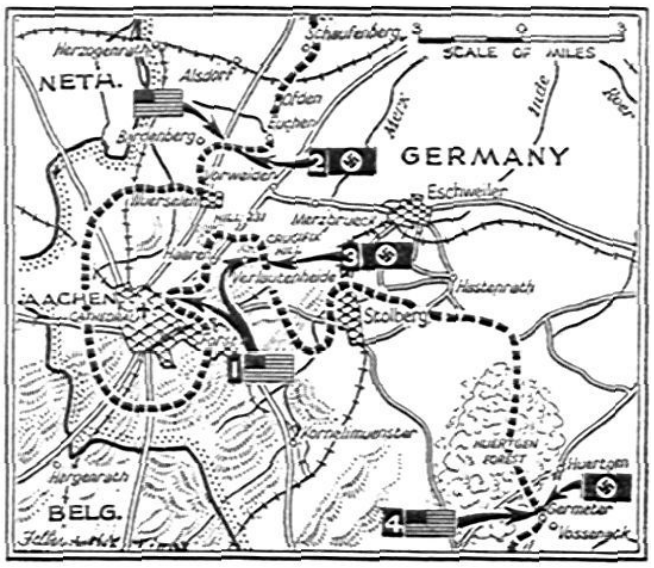
On 8 Oct the offensive on the south side of Aachen was renewed. An attack was directed northward between Aachen and Stolberg, after an air and 45-minute artillery preparation. This met very severe enemy fire, but a gain of nearly 2 miles was made as far as Verlautenheide and Crucifix Hill (3 miles northeast of Aachen). The attack from the north reached the Ofden area, leaving a 4-mile space between the two attacks. Crucifix Hill is an excellent OP, although broken by artillery fire. It derives its name from a large crucifix on top. This was hollow, and had a staircase inside enabling a good view to be had of the surrounding country.

It was expected to close the 4-mile gap within the next 24 hours. By next day the gap was reduced to 1½ miles, all the gain being on the north. The south offensive was stopped by numerous strong enemy attacks. Aachen was so nearly surrounded that the First Army believed it might be induced to surrender. At 1015 hrs. on the 10th a flag of truce was sent into Aachen with a message to the German commander stating in part,

"You will either unconditionally surrender the city with everything now in it, thus avoiding needless loss of German blood and property, or you may refuse and await its complete destruction . . . the American Army ground and air forces will proceed ruthlessly with air and artillery bombardment to reduce it to submission." 24 hours were allowed for reply.

The American ultimatum was part of the psychological warfare. It was intended later to widely publicize throughout Germany that Aachen had been given a chance to avoid complete obliteration, had refused, and had then been obliterated. It was believed that the effect would be to induce other cities to accept surrender unconditionally. The ultimatum was mimeographed, copies being fired by the artillery into Aachen. No reply was received, but about 250 Germans (including civilians) surrendered.

On the 11th, shortly after the hour of expiration of the ultimatum, dive bombers blasted the city for 4 hours, after which the artillery started to shell the town. Next day Aachen was again attacked by hundreds of fighter-bombers, while 50 batteries shelled it. The Germans assembled 2 new divisions to northeast of the city, presumably for a counterattack.



After the bomb and shell bombardment of the German frontier city the Americans broke into the northeastern part (1) and battled on. East of Bardenberg German infantry attacked the left flank of the upper arm of the American pincers (2) but was flung back. Similarly an enemy thrust in the vicinity of Verlautenbeide (3) was repulsed. To the southeast our troops firmly held Germeter and Vossenack (4) after having repelled a German blow.

Infantry entered Aachen from the east on the morning of 13 Oct. A fierce battle started at once. The streets were not mined, but fighting was difficult. The enemy had a number of SP 88-mm guns, which fired from inside of buildings; after a few rounds they would back out and take position elsewhere. Outside the city the Germans attacked but made no progress. American attacks to close the gap around Aachen were continued daily. Fighting spread over the entire front from Geilenkirchen to the Huertgen Forest on the south, where the Germans used dug-in tanks; after firing from a position they would proceed rapidly to some new previously prepared location.

The attacks outside of Aachen to close the gap around that city met strong opposition with constant enemy counterattacks. The gap was finally closed on the 17th, it having taken 9 days to make the last 4 miles. By 18 Oct about half of Aachen had been taken in the constant street and house battle, greatest progress being made from the northeast and from the south. On this date another violent air attack was made against the northwest quarter, which seemed to be the enemy's principal center of resistance.

OPERATIONS OF THE U. S. THIRD ARMY

The Attack on Metz

Lines of communication into Germany via the Moselle valley pass through Trier. Both multi-lane roads and 4-track railroads divide just south of there. Main lines extend through Metz, into France. Another line goes through Luxembourg, and still another through Saarlouis.

Toward the end of September attempts were renew to advance directly on Trier, but they did not give much promise and were not pushed. Efforts were concentrated to capturing Metz. This city is surrounded by a ring of forts which were occupied by the enemy when the first Americans arrived on 4 Sep. These forts are modernized ancient ones. They are in general located on heights commanding the surrounding country. Their distance from Metz varies with the terrain, but none are more than 5 miles away.

The forts are of stone or concrete, with thick overhead cover and deep subterranean galleries. Guns and machine guns are mounted in steel turrets, some of which are of the disappearing type. The forts are believed to have their own power plants; they have wells for water. Although the Moselle River was the general front in this sector at mid-September, the possession of Metz gave the enemy an important bridgehead on the west side. It was of course a first-class road block to all lines of communication in the vicinity.

The Third U. S. Army had a bridgehead east of the Moselle south of Metz. On 19 Sep operations were in progress to extend this with a view to encircling Metz from the south. This met much opposition near Sillegny (5½ miles due south of Metz) but in hard fighting advanced to Coin-sur-Seille, only 5 miles from the city. This operation here found the enemy's main line of resistance too strong; the movement temporarily came to a halt.

It was now decided to attack the forts protecting Metz on the west side of the Moselle. Two sectors were selected. The northern one was opposite Maizieres-les-Metz, 5 miles from Metz; the southern was directed against Fort Driant, 5 miles southwest and overlooking the Moselle valley. Both attacks made slow progress; more so at Fort Driant. The attacking troops reached this on the 4th, and were able under cover of the artillery fire to enter the moat. Using flame throwers liberally, some men mounted on the fort, poured crude oil down ventilators and other openings, then set it on fire. To protect the men working on this, unusually dense smoke clouds were laid down. In this manner the attacking party burned its way in at the southeast and southwest corners. An inside gallery battle now started with both sides using grenades, bazookas, machine guns, and hand weapons. The galleries were closed at intervals by steel doors; these were blasted down one after another.

This battle went on for days. Each side attacked in turn. The Germans had a road from Metz leading into the fort from the north side. This was not reached by the Americans, so the Germans were able to receive supplies and replacements substantially without interference. The attackers were obliged to send their supplies across country up to the top of the hill upon which Fort Driant is situated, and thence down into the moat into the openings held. This movement was subject to fire from the enemy forts to north and south which had not been neutralized; it was costly.

On 9 Oct the artillery fired mimeographs demanding surrender

into untaken Fort Driant. This had no effect. Neither was it found possible to continue on with the underground gallery battle without excessive losses. It was decided to give up the attempt. On the night 12/13 Oct the troops which were still in Fort Driant were withdrawn.

During the nearly 10 days of underground fighting the troops had been supported by strong artillery and air attacks. The fort withstood the heaviest bombs used—reported as 1,000 lbs. It seemed to withstand all artillery shells easily. In view of this experience no further attacks on the forts were made.

In the meantime the attack on Maizieres-les-Metz had reached its objective on the 9th. The usual street and house battle started in at once, and had not entirely ceased when this account closed on the 18th.

Operations Around Nancy

On 19 Sep the Third Army had a bridgehead around Nancy about 9 miles deep. On the 23d an operation was launched to widen it toward the north and northeast. In this vicinity the terrain is full of hills and woods. Hills do not much exceed 1,000 feet above the neighboring country, but they have steep slopes and numerous woods and so are difficult for vehicles. By night the line had been advanced to Morey, 9 miles north of Nancy.

The fighting continued until the 25th, on which date the line was approximately **Diculouard—Morey—Bioncourt (?)—Champenoux Forest—Henamenil (?)—Benamenil (G).**

Two days later the Germans started an attack with considerable armor and strong artillery support on a 15-mile front headed southwest on the line Pettoncourt—Bezange-la Grande—Coincourt. At the same time the American attack was renewed northward from Nancy, and northeastward from Luneville. This situation resulted in a German offensive in the center and American ones on both flanks. All three made limited progress. The enemy in the center reached and entered the Bois de Parroy. On the 28th an American counterattack advanced 3 miles into that woods without entirely clearing the enemy out. Next day, attacking on the other flank, an advance was made near Pettoncourt. This attack was pushed and on the 30th reached Jallaucourt, 6 miles WNW of Chateau Salins. The north side of the Nancy bridgehead was now almost a straight east-west line from Diculouard to Jallaucourt, where there was a sharp salient, the line turning to about a SSE direction.

On the first of October the Germans attacked southward toward Jallaucourt, but were held. Further east the American salient was extended to include most of the Gremecy forest, bringing the line within 8 miles of Chateau Salins. In the Parroy forest both sides had troops fighting one another. This forest battle went on for days; both sides fought with infantry supported by tanks with alternate gains and losses.

On 8 Oct the Third Army attacked from the north side of the bridgehead on a front of 20 miles from the line Morey—Bioncourt—Jallacourt. Following a powerful artillery preparation, the infantry jumped off at 0600 hrs. The 9th Air Force supported the attack by constant waves of fighters and fighter-bombers. The XII Corps, with 35th and 18th Inf and 6th Arm Divs, delivered the assault. By noon most objectives had been reached. The armor proceeded in the intervals between hills, then attacked from the rear. By night substantial gains had been made to the line **Diculouard—Mt. St. Jean (just west of Jeandelaincourt, which was also taken)—Chenicourt—Jallaucourt.**

The attack was pushed next day. In the valley of the Seille the line was advanced from Chenicourt to Letricourt. On the high ground west of the valley the villages of Serrieres and Lizieres, both at the foot of Mt. St. Jean, were taken.

There was no further substantial change in this sector down through the 18th. At that date most of Parroy forest and the village of Parroy were American-held.

Operations in the Vosges Foothills

The Vosges Mountains extend in a north-south direction for about 90 miles from opposite Nancy to just north of Belfort. In the south they exceed 4,500 feet in elevation; in the north they do not exceed 3,000 feet and are usually under 2,500 feet. Dense-woods in general cover them. The main mountain range is 30 miles wide; there is no railroad through it and but few roads. On the west side the foothills cover another 20 miles. Everywhere the front line was in front of the foothills.

The mountains can be turned on the north. However, the lines of communication in that area go through Metz or Chateau Salins, both held by the enemy as effective road blocks. At the south is the Belfort Pass, 16 miles wide from the tip of the mountains to the Swiss frontier. This the enemy has blocked by the first-class fortress of Belfort, which is right in the pass.

Operations facing the Vosges Mountains have been conducted by the Third Army north of Epinal and the 6th Army Group south of that place. Their mission has been to move on Belfort with a view of reducing it and at the same time force the enemy back along the whole line of the Visges.

On 19 Sep a general attack was started. The Third Army attacked on the north between Luneville (held by the enemy) and Charmes on the Moselle, a 20-mile front. The Seventh Army attacked on a 15-mile front between Luxeuil and Lure. Considerable success was had at the north, where within three days Luneville was

taken and the line advanced south thereof in a due south direction to Magnieres, 12 miles away. During the same period the Seventh Army advanced 6 miles to Belmont. The country around the latter place was rough and wooded—very suitable for defense.

On the 22nd the attack was extended to include the sector between the two original offensives. Epinal was entered the same day, and the Moselle River crossed in this vicinity. Several German bridgeheads which had been retained on the west side of the Moselle between Epinal and Remiremont were withdrawn. Fougerolles was taken by the Allies and Epinal finally cleared on the 25th. This latter was originally a French barrier fortress with a ring of permanent forts around it. Its capture was of considerable importance.

In view of this success, on the following day a strong attack was delivered half way between Charmes and Epinal, which resulted in securing a good bridgehead over the Moselle about Chatel-sur-Moselle. Troops from Epinal attacked at the same time northeastwardly toward Rambervillers and reached a line through Bult and Destord (only 4 miles from the objective) on the 28th. Attacking every day American armor entered Rambervillers on the 30th.

Increased German resistance was now encountered. Attacks from the vicinity of Rambervillers brought no gains. New attacks were started to secure the main road from Epinal to Rambervillers, by attacking southeast from it. This minor mission was accomplished by 3 Oct by advancing the line to Grandvillers—Lepanges.

Meanwhile the Seventh Army had been making steady progress through the wooded hills. It had reached the vicinity of Le Thillot, a small town of 4,000 people on the Moselle River, surrounded by hills. It was at the foot of the main Vosges Mountains and near their highest and roughest part. Fighting all along the front was very heavy. The Germans counterattacked frequently and defended every place.

No progress was made in the Rambervillers area—in fact, a small sector was lost. Gains were made to the south. From Lepanges an advance was made to Herpelmont and Laveline, a gain of 5 miles. Although Le Thillot was surrounded on three sides it was impracticable at this time to capture it. A crossing of the Moselle was made to the north. Going across mountains about 3,000 feet high with steep slopes and thick woods, this attack on 13 Oct reached the vicinity of Cornimont, which was taken next day.

The attack was now renewed at the north end, beyond Rambervillers. Attacking southeast from the Luneville area American troops reached the line Glonville—Fontenoy (3 miles northwest of Baccarat) on the 15th. Advancing northeast from Lepanges and southeast from the Rambervillers—Epinal Road, Laval (2 miles southwest of Bruyeres) was taken on the 17th.

At the end of the period the advance in one month from the Moselle valley averaged 16 miles at the north and nearly 30 miles in the south, notwithstanding that the terrain in the south was apparently much more difficult.

DETACHED GERMAN STRONG POINTS

On 18 Sep the Germans held Boulogne and Calais by detached garrisons. Both places were under siege, together with Cape Griz Nez, attached to Calais.

At Boulogne principal operations were by ground approach, which steadily contracted the area held by the enemy until only a small section of the port remained. This succumbed on 24 Sep. Port works were completely demolished. The garrison was found to have numbered about 6,000 men.

Principal attack at Calais was by air, as much as 1,000 tons of bombs being dropped in one day. After a 2-day air preparation a ground attack was delivered on 25 Sep. It failed to make much of an advance. Persisting, gradually increasing success was had during the following days. Even flooded ground was crossed. On 29 Sep a 24-hour truce was arranged during which the civilian population was evacuated; then the attack was renewed and Calais, together with Cape Griz Nez, fell early on 1 Oct. This port also had been completely demolished. About 4,000 prisoners were taken.

In the same vicinity the enemy holds a force estimated as about 15,000 men holding Dunkerque. The perimeter of the defense is roughly a semi-circle with a radius of 6 miles. Exits are causeways through inundated areas which are mined. It is consequently a hard place to attack with ground troops. It is known that the harbor has been completely wrecked.

The enemy also has strong points as follows:

Armored bulldozers have done a fine job from Pacific islands to the European mainland. Sometimes, however, obstacles must be cleared away under fire (such as from AT guns) heavier than their armor can turn. Consequently this "tank dozer" was developed. In Normandy it was invaluable for pushing holes through hedgerow embankments, and continues to be so for clearing rubble from the streets of towns still strongly held by the enemy and for other road work.

Channel Islands	**Held by about a division (12,000 men)**
Lorient	**Held by part of XXV Corps, maybe 25,000 men**
St. Nazaire	**Estimated garrison is 30,000**
La Rochelle	**Estimated garrison is 12,000**
Gironde North }	**Blocks entrance to Bordeaux. Garrison is about**
Gironde South }	**20,000.**

There have been no attacks on these places. Their garrisons have taken advantage of the situation by making sallies and deep raids, through which they have been able to obtain considerable supplies.

There has been no information as to two small harbor blocks at Toulon and Marseille. These were islets with small garrisons, but sufficient to interrupt harbor traffic.

THE LINE

On 18 October the line was

West Schelde River (with German beachhead on south bank about Breskens)—Woensdrecht (Allies)—Esschen (German)—Meerle (A)—point 3 miles south of Tilburg—'s Hertogenbosch (German)—Ravestein (?)—Druten (G)—Neder Rijn (or Lek) River from opposite Wageningen to Arnhem—Mook (G)—Maas (Meuse) River to Vierlingsbeek (A)—Venraai (A)—Helenaveen (?)—Weert (G)—Maeseyck (A)—Sittard (?)—Geilenkirchen (G)—Stolberg (with German strongpoint in Aachen in this sector)—Huertgen (G)—Monschau (A)—Our River—Mosel (Moselle) River with Germans on west side in Maizieres-les-Metz and strong German bridgehead about Metz—Diculouard (A)—Serrieres (A)—Chenicourt (A)—Jallaucourt (A)—Gremecy Forest (A)—Arracourt (A)—Parroy (A)—Binamenil (G)—Glonville (A)—Fontenoy (A)—Rambervillers (A)—Bruyeres (G)—Lavaline (A)—Granges (G)—La Bresse (G)—Le Thillot (G)—Ronchamp (?)—Belverne (G)—Montbard (G)—Pont de Roide (A)—Blamont (?).

THE WAR IN ITALY (19 Sep to Oct 44)

An allied Group of Armies, consisting of the Fifth U. S. Army on the left and the Eighth British Army on the right, at the beginning of the period held the line

Viareggio (German)—Pte. Moriano (5th Army)—high ground north of Pistoja—Barberino di Mugello (5th)—point 5 miles south of Firenzuola (5th)—Galeata (G)—San Marino (neutral state between the lines)—point on Adriatic coast 4 miles southeast of Rimini (8th Army).

The Army Group commander was Gen. Sir Harold R. L. G. Alexander, the Army commanders Lt. Gen. Mark W. Clark and Lt. Gen. Sir Oliver W. H. Leese. The strength of the Army Group has not yet been released. It was a very mixed command: in addition to Americans and British, there were sizable contingents from Canada, India, New Zealand, Poland, Greece, South Africa, and Brazil. The former French Corps has been withdrawn.

The enemy consisted of an estimated 27 divisions under Field Marshal von Kesselring. About 7 of his divisions were watching the right flank along the seacoast from the French boundary to the battle line and the Alps mountain line separating France from Italy, and guarding rear areas. About 4 divisions were in local reserve, leaving 16 divisions in line on a front which extended over 130 miles. Except for short sections, not exceeding 5 miles along each on the two coasts, the remainder of the front was mountainous. It was very rough, and contained many woods except at the higher elevations, which were generally open grazing land at this season. A fair number of roads traverse the mountains from south to north; these have steep grades and run through long defiles.

As this account opens the Fifth U. S. Army had just started a major offensive astride the road from Firenze (Florence) to Bologna. The Eighth British Army had been engaged for some time in attacking the enemy's left, in an effort to reach the line Bologna—Ferrara and from there cut the enemy's line of communications into the province of Venetia, from where it continued on through the Brenner Pass into Bavaria and northeast into Austria. Both offensives were meeting very strong opposition on the ground, which was favored by the terrain. The British attack had the support of naval forces, which shelled with enfilade fire that part of the enemy's lines near the Adriatic. Both offensives had overwhelming air support. German air activity was slight, and usually confined to reconnaissance missions.

Allied attacks used a great array of materiel. Tanks and armored cars were in excess of any armor the enemy could bring into action. Allied artillery was superior in number and in quantity of ammunition furnished; this enabled excellent artillery support to be habitual.

Fighting continuously on 19, 20, and 21 Sep, the two offensives on the latter day reached their respective immediate objectives of Firenzuola and Rimini for gains of 5 and 4 miles in 3 days. The final attack on Rimini, which lies in flat country, was led by armor. In general tank losses appear to have been high throughout the campaign.

These successes did not stop the battle. Tired troops were replaced, and the attack forward was continued without interruption. In the next four days the two main offensives moved slowly forward. The Fifth Army (with American, British, and Indian divisions in line from left to right) gained about 5 miles; the Eighth Army (with British and Canadian divisions) gained 6 and reached Bardonchio.

At this time the Allied line consisted of a narrow salient extending north through Firenzuola and advanced right along the Adriatic. The remainder of the front had not materially changed. Still advancing with the right along the Adriatic, the Eighth Army on the 27th crossed the Rubicon River on a 10-mile front for a 2-mile advance beyond.

The weather, which had so far been good, now took an unfavorable turn, limiting air activities to about 10% of normal. Taking advantage of this situation, the Germans on the 28th counterattacked toward the Rubicon and temporarily stopped the British advance. A similar attack, with same result, developed in the Fifth Army's sector on the 29th. As the bad weather continued major attacks came to a standstill. Only minor raids and attacks occurred, with each side scoring one small success.

On 1 Oct the Allied attacks were renewed. By, 5 Oct the Fifth Army in hard fighting had pushed the head of its salient forward to include Loiano, being a 13-mile advance from Firenzuola in 14 days. The Eighth Army was not making such good progress in its coast sector, and started to shift its main effort more and more to the west among the mountains. With better weather the allied offensives increased in strength.

On 11 Oct both Allied attacks made gains. The Fifth Army extended its offensive to the west coast, where an American Negro division (the 92nd) and a Brazilian division advanced to a line through Gallicano—Barga in the Serchio valley.

Increased resistance being encountered, no appreciable advance was made during the next two days. On the night 12/13 Oct more than 500 bombers attacked about Bologna, with a view of facilitating the advance of the Fifth Army by destroying enemy bases. This bombing was not particularly successful.

The Fifth's advance was delayed in Livergnano, a stone village in a narrow valley between sheer precipices nearly 100 feet high. It could not easily be by-passed. It took four days of street and house battle to get by this place and open the road, which was effected on the 16th. Next day, despite a strong artillery preparation, the American advance was only about half a mile.

Notwithstanding very strong attacks, only slight gains were made during the next two days. On 18 Oct the line was approximately

Viareggio (G)—Gallicano (A)—Barga (A)—Montese (?)—Vergato (G)—point 2 miles north of Loiano—Marradi (?)—Cesena (G)—Cesenatico (G).

In the center the advance had been 19 miles in one month. On the Adriatic the gain was about 13 miles.

THE WAR ON THE RUSSIAN FRONT (19 Sep to Oct 44)

FINLAND

On 19 Sep the German forces in Finland, estimated at 7 divisions, were divided into south and north groups. The south force was withdrawing north from a line along the Oulung River (Oulungjoki), the north one was holding a north-south line extending south from the east shore of the Rybachi (Fisher) peninsula. A Finnish army was about to attack the south force, and a Russian army had already commenced an attack against the north one. The Germans had no intention of resisting; they were evacuating Finland.

No serious fighting took place during September. By the end of the month the south force had withdrawn to north of Kemi, where it made a stand and repulsed the Finns who were following. It is not yet known whether these Germans were seeking to embark on transports at the port of Tornio, but this appears to have been the intention. This was stopped by a Finn amphibious expedition, which unexpectedly landed in Tornio on the night preceding 1 Oct. A series of sharp clashes then occurred in which the Germans sought to retake Tornio. The German attack failed, the Finns managing to hold on to the seized port. At the same time they attacked along the shore road northward from Kemi.

The Germans thereupon gave up the attempt to take Tornio, but held on to the surrounding country until after their troops from Kemi had cleared the Tornio sector. Thereafter the Germans withdrew northward. They are apparently headed for north Norway, the nearest German base being about 300 miles away, beyond a barren intervening country. Due to the early winter the ground is generally frozen early in October, facilitating movements of vehicles.

On 7 Oct the Russians launched an attack against the north German front, previous operations having been restricted to exploratory raids. The initial Russian attacks, although strongly pressed, failed to make substantial progress. To speed the advance an amphibious expedition was sent from Murmansk, which landed on 10 Oct on Rybachi peninsula in rear of the German lines.

The Russians failed to encircle the Germans but they forced the

abandonment of their positions. The Germans fell back to before Petsamo. The Russians followed closely.

Superior in strength to the Germans, the Russians now sought to encircle their positions from the south. The Germans avoided this by abandoning Petsamo which was entered by the Russians on 15 Oct. According to German reports the Russians have used very large air forces in this campaign and have had an unusual number of planes downed. This runs from 50 to 80 a day, and in general exceeds all other claimed Russian air losses over the remainder of the very long front.

On 18 Oct the line was

in south Finland, almost just on the Arctic Circle; in north Finland, a north-south line just east from Kirkenes.

The Germans have a highway from Kirkenes to north Norway. There is no regular road available for the south force.

THE BALTIC STATES

On 19 Sep the line was

Johvi (German)—Iiasaku (G)—Lake Peipus—Ema River—Lake Virts—Valga (G)—Smiltene (G)—Jaungelgava (Russian)—Jelgava (R)—Zagare (R)—Siauliai (R)—Raseinai (R)—Vilkaviskis (R).

Germany's loss of three allies (Finland, Romania, and Bulgaria) and her reverses in France resulted in a new plan of defense against the converging attacks of the Americans and British on the west and the Russians on the east. The decision was to evacuate large areas in order to secure a shorter line which might be held by the number of German divisions now available. This included a withdrawal from France and from the Balkans (including the Aegean Islands). It further included abandonment of the three small Baltic States, less some small areas.

The retreat from Estonia began in early September, largely by water transportation. It seems to have escaped Russian observation for a time. On 16 Sep the Russians had started a large scale offensive on a 160-mile front between Lake Peipus and the Daugava (Dvina) River, with 40 infantry divisions in line plus an unascertained number of armored troops and artillery divisions. When this account opens the Russians had reached the line indicated above, with the 3d Baltic Army Group (Col. Gen. Ivan S. Maslanikov) on the north and the 2nd Baltic Army Group (Gen. Andrei I. Yeremenko) on the south.

Simultaneous with the above offensive the 1st Baltic Army Group (Col. Gen. Ivan C. Bagramian) which was south of the Daugava River was attacking in south Latvia and in Lithuania.

The Germans did not seriously contest these offensives. The terrain was much cut up by lakes and streams which restricted advances to certain spaces. There was much forest in the land. By destroying bridges, felling trees over roads, planting extensive mine fields, and by the judicious use of rear guards the Germans managed to withdraw their main bodies without serious losses. Special attention was given to antitank protection, as Russian spearheads were habitually largely composed of armored troops. A tank disabled about a bridge or in a narrow road, became a temporary road block. When the situation appeared favorable a certain number of German counterattacks were delivered. This was especially the case in the area around Jelgava, where the Germans had only a 15-mile corridor along the Gulf of Riga as the only land connection to Riga and beyond. It was essential to German plans to keep this open until after the rear guards had cleared Riga. Much of the German withdrawal was by water, however.

The Russians extended their attack on the north to include the isthmus between the Gulf of Finland and Lake Peipus. This sector was occupied by the Leningrad Army Group (Marshal Leonid Govorov). Pushing straight ahead this force reached the port of Tallinn (Reval), which was also the capital of Estonia, on 22 Sep.

By 27 Sep the Russians had reached the sea from Tallinn west and south to north of Riga. They had secured some booty, but less than usually taken and very few prisoners. There had been no substantial change in the line south of Riga. Along the entire front since the commencement of the offensive on the 15th, about 100 Russian divisions had been in line. According to German reports their tank losses exceeded 1,000, or an average of 80 a day. This is probably a moderate loss for a front of 225 miles under modern conditions.

On 3 Oct the Russians started to occupy the islands across the entrance to the Gulf of Riga. The first island, Dago (Dagoe or Hiiu), was taken without difficulty on that day.

On 5 Oct the 1st Baltic and 3d White Russian Army Groups started a large scale offensive due west from Siauliai on a 130-mile front with a view of driving to the coast and separating the German forces around Riga from their home country. An attack on Riga was continued at the same time. That city was fortified; progress against it was slow. At the same time the attack against the Riga Bay islands continued. An amphibious expedition landed on the north end of Oesel Island on the 6th. The German garrison retreated slowly southward, abandoning the island except the Svorbe peninsula at the south end. This contains batteries controlling the main ship channel to Riga. The Russians have since repeatedly attacked this peninsula, and have attempted to land troops in rear of the German land defense line. None of these efforts has succeeded.

On 10 Oct the Russians reached the Lithuanian coast at Palanga, about 16 miles north of Memel. At this date the attack on Riga was still being held by the enemy and the German corridor along the south side of the Gulf of Riga was open. Sea communication to Riga was available due to the Germans' holding the south end of Oesel. From Palanga the Russian line extended almost in a straight line to Jelgava to the northeast, while to the south it ran close to and parallel to the frontier of East Prussia. This was found to be heavily defended, with indications that the enemy intended to hold it.

Riga fell on 13 Oct. At date of writing it appears that the Germans withdrew partly by sea, and partly by the corridor. As there was no further use for the corridor the Germans immediately withdrew westward from that sector, as far as the Lielupe River.

On 18 Oct the line was

Lielupe River—Jelgava (R)—Zagare (R)—Mazeikiai (R)—point on sea 12 miles south of Liepaja (Libau). German beachhead on south (Svorbe) peninsula of Oesel Island.

The area north of the above line constituted a large German beachhead about the ports of Liepaja and Ventspils (Windau).

The line continued on

along sea coast from south of Liepaja to Palanga (R)—Taurage (R)—Sakiai (R)—Vilkaviskis (?)—Suvalki (G).

POLAND

On 19 Sep the line was

Suvalki (G)—Augustow (G)—Osovets (R)—Narew River to vicinity of Warsaw, with small Russian and German bridgeheads at various points—Praga (R)—Vistula (Wista) River (with Russian bridgeheads south of the Pilica and in vicinity of Sandomierz)—Mielec (R)—Rseszow (R)—Jaslo (G)—Duklo (G).

The Polish front has been relatively tranquil.

In Warsaw there was a Polish insurrection in progress under Gen. Boromorowski (usually called "Bor" for convenience). On 21 Sep the Russians made an attempt to cross the Vistula at Warsaw. This was a complete failure. Thereafter the reduction by the Germans of the Poles proceeded methodically. On 2 Oct they surrendered with the honors of war.

In early October the Germans commenced operations to reduce a Russian bridgehead near Pultusk, while the Russians attempted to reduce a German one near Warsaw. Neither attempt was fully successful.

On 10 Oct a general Russian attack began along the Niemen River, with center opposite Rozan, just south of which the Russians had a bridgehead on the north side of the river. On the first two days only small gains were made, and fresh divisions were sent in on the 12th with very strong artillery and air support. The Germans also employed large air forces whose mission was to relieve the ground troops by suitable attacks on advancing enemy parties. This battle died down temporarily after the 13th, without having materially changed the front. It restarted on the 15th.

Next day a new attack was launched. It was apparently a diversion for a more important one just north of Suvalki. This had a front of only 25 miles but was in great force. This made progress, although it was slow. On 18 Oct this attack had reached the border of East Prussia.

With this exception, the line had not substantially changed during the period.

HUNGARY

A very determined effort has been made by the Russians to eliminate Hungary from the war. The shift of Romania from the Axis to the Allies had given the Russians 12 Romanian divisions, and a new front along the south side of Hungary. First measures were to clear the enemy out of Transylvania.

The 4th Ukraine Army Group (Col. Gen. Ivan Y. Petrov) was in line on the east of Hungary, and the 2nd Ukraine Army Group (Marshal Rodio Y. Malinovsky) was on the south. The enemy were mixed Hungarians and Germans. The line on 19 Sep was

Dukla (?)—Jasliska (R)—Dolina (R)—Nadworna (R)—Delatyn (R)—Kuty (R)—Radauti (G)—Suceava (R)—Falticeni (R)—Gheorgheni (R)—Odorhei (R)—Targul Mures (G)—Turda (G)—Huedin (G)—Beius (G)—Ineu (?)—Arad (G).

The general form of the front was a German salient occupying a large part of Transylvania.

At the beginning of the period about 30 Russians and Romanian divisions were engaged in an offensive between Turda and Gheorgheni, both inclusive on a front of about 125 miles. A secondary effort was an attack against the Dukla and adjacent passes, on the opposite side of Transylvania.

Notwithstanding continuous attacks the Russian advance was for a time slow. Romanian troops entered Targul Mures on 28 Sep, thereby opening a route across the Muresul River. They then pushed on at once with main effort toward Reghin further up the valley. The Russian offensive was now extended westward along the entire line to Arad. Due to the terrain, and partly to lack of troops, this front was not entirely continuous; the battles centered about the main lines of communication. Main Russian efforts were toward Reghin, Cluj, Oradea, and Bekescaba.

After considerable minor fighting the Russians launched a major offensive on 3 Oct in the sector from Arad to Oradea. At the time the frontier between Hungary and Transylvania was entirely in Axis hands. German and Hungarian troops met the attack by strong counterattacks particularly in the vicinity of Oradea, where the terrain was suitable for operations of armored troops. For three days there was heavy fighting, with the Russians gaining west of Arad only. On 6 Oct their incessant attacks began to make appreciable progress. Next day the advance in the center reached the line Oroshaza—Bekescaba. The flanks had not kept up and were in rear.

The Axis commander now ordered a retreat to in rear of the Koeroes River, which involved withdrawal of his right and center but not his left, which at Oradea was already on this line. This maneuver tended to cover Budapest, which it seems was presumed to have been the Russian objective.

Next day—the 18th—the Russians forced a crossing of the Koeroes River west of Oradea. Armored troops dashed across. Instead of marching toward Budapest they went north toward Debreczen. They arrived opposite that city on the 9th.

There were strong German and Hungarian armored forces in this area, which is generally flat and excellent for maneuvers of motorized forces. These intercepted the Russians southwest of Debreczen. A long battle resulted with both armored forces seeking to encircle its opponent.

Other Russian forces reached the line of the Koeroes River on the 9th and established a bridgehead on the west bank south of Csongrad. The Axis managed to find troops to seal this operation. German GHQ issued orders for the evacuation of all of Transylvania, where there was a large German-held salient. It seems probable that the line to which the withdrawal was directed was the Tisza (Theiss) River. This would shorten the front by 175 miles, and release 15 or more divisions. At this time most of the salient was under daily Russian attack, and some withdrawal had already been forced.

In the meantime the great tank battle south of Debreczen continued. Each side claims to have inflicted extraordinary tank losses on the opposite side. There was no decision. The Russians could not take Debreczen, and the Germans were unable to drive them off. It became a battle of attrition.

On 12 Oct the Russians organized a new attack to turn Debreczen from the south. This forced a crossing of the Koeroes River 45 miles southwest of Debreczen, when armored troops dashed 35 miles forward to Abadszalok on the Tisza River before being intercepted.

The Russian left captured Szeged on the 11th, affording another bridgehead over the Tisza River. Until 18 Oct there was no further material change in the line, although the great tank battle near Debreczen kept on. The German retreat from Transylvania, according to their accounts, proceeded without interference.

The line at the end of the period was

Dukla Pass (G)—southeast along the Carpathian Mountains with all passes in Russian hands to Raho (Rachov) (G)—Sighet (?)—Baia Mare (G)—Valea-lui-Mihai (?)—Debreczen (G)—Hajduszoboszlo (R)—Abadszalok (R)—Mezoetur (G)—Koeroes River—Tisza River (with Russian bridgeheads south of Csongrad and at Szeged).

YUGOSLAVIA

At the beginning of the period the line was

Arad (G)—Timisoara (G)—east boundary of Yugoslavia to include the Bulgarian frontier.

The Russian forces belonged to the 3d Ukrainian Army Group (Gen. Feodor Tolbukhin). He was aided by a large force of Yugoslav Partisans belonging to Marshal Tito's command, and by the regular Bulgar Army, which had recently shifted sides in the war.

At the beginning of September, the Germans had commenced to evacuate Greece and the Aegean Islands. Much of this movement passed through Salonika. From there the line of communications lay via the Vardar and Morava valleys through Belgrade. There were a good road and a railroad. An alternative route diverged at Skoplje to the northwest, and with both road and railroad passed through Sarajevo and on into Germany. On account of mountain grades this was a less desirable line, but it was practicable. Yugoslav partisans often attacked this line, but had never succeeded in closing it. The Russian mission was to close the main German line of communications, and if possible cut off all German forces to the south.

The Russians were not immediately prepared to undertake a serious offensive. They did not move until 27 Sep, when they started

Near the end of the period British troops occupied Athens (1) and took over Corfu (2) after the few remaining Germans on the island had surrendered. Yugoslav and Bulgarian forces captured Nish (3). The Russians, aided by Marshal Tito's men, reached the Nish-Belgrade railway in another sector between Aleksinac and Cuprija and took Arandjelovac (4). They and the Yugoslavs were fighting inside Belgrade, according to a Tito communique, after a push up through Ripanj and Kumodraz (inset). Soviet and Rumanian troops advanced in Transylvania between Gherla and Mintiu (5).

to force a crossing of the Danube River in the vicinity of Orsova. At this point a large bend in the river extends into Romania. It was possible for the Russians to attack three sides of this salient, and they effected their crossing, although not without considerable losses. It took until the 30th before the Russians were solidly across.

This offensive was supplemented by another which on 2 Oct attacked westward north of the Danube toward the line Vrsac—Bela Crkva. The latter point was taken on the first day. This Russian force contained numerous motorized troops and their objective was Belgrade (Beograd). The south attack contained mountain troops. It advanced almost due south following a railroad, and reached Zajecar on the 6th. On the same day the north attack not having met strong resistance arrived within 10 miles of Belgrade, on the north side of the Danube.

German reinforcements counterattacked in both areas on the 9th without making any gains. Some of the fighting was savage.

The south Russian attack shifted its main effort to its right. This advanced across country and cut the Belgrade & Nish RR near Palanka (well north of the junction where the German alternate line turns off). At the same time the Russians continued to push their left toward Nish. Bulgar forces now joined and extended the Russian left to east of Nish. Other Bulgar forces assumed the offensive along each pass on their west border.

The south Russian attack continued to expand; its right came opposite to Belgrade on the south side of the Danube on the 14th. The north attack had in the meantime not made progress. On the same day Bulgar forces entered Nish but did not clear it until the 16th.

On 15 Oct the Russian south attack entered the south part of Belgrade. The north attack spread northward in the area south of Szeged.

On 18 Oct the line was

Szeged (R)—Subotica (R)—Senta (R)—Tisa River—Belgrade (?)—Morava valley to Nish (R)—Leskovac (G)—Kriva Palanka (?)—Stip (G)—Strumica (Strumnitza) (G)—Kilkis (G)—Stavros (G).

This left the Germans the use of the alternate line of communications from Salonika to the north via Skoplje and Sarajevo.

THE WAR AGAINST JAPAN (19 Sep to Oct 44)

NOTE: All dates in this section are local, or east longitude dates. USN communiques are ordinarily in west longitude time, which makes their dates one day earlier than standard.

SOUTHEAST ASIA

Chin Hills

On 19 Sep the 5th India Division was headed south on the road from Manipur to Tiddim, pursuing a Japanese force which was retreating from its spring invasion of Manipur. The British were 37 miles north from Tiddim, at a point where the road crosses the Manipur River. The enemy had this under artillery fire. On the 22nd the enemy withdrew and an 8-mile advance was made.

Some contact was regained on the 27th. On the 30th the India Division arrived at the enemy's new position, about 13 miles north of Tiddim and at the foot of what was known as the Chocolate Staircase (a long series of hairpin bends and steep slopes by which the road rises about 3,000 feet from the Manipur valley to Tiddim, which lies to the east on high ground).

A detachment of India troops was sent overland through jungle mountains to a position 9 miles in rear of the front and 4 miles north of Tiddim. Here they established a road block. On account of the country it was impracticable for the enemy to supply troops beyond it. On 5 Oct, the day after the block was established, the Japanese withdrew to close to Tiddim. The British main body moved forward.

On 7 Oct the attack on Tiddim began. This turned out to be a difficult job. There being a lack of good artillery positions, the air force was ordered to bomb the hostile defenses. But it took 10 days to capture the town.

North Burma

In addition to the Southeast Asia Command, the Chinese have a front known as the Salween. This has been advancing southward along the Burma Road with the mission of joining Gen. Stilwell's forces. Throughout the period the Chinese were at Tengyueh.

Other Chinese forces of the same command have been engaged for months in attempting to remove Japanese road blocks over the south branch of the Burma Road about Lungling and Mangshih. No appreciable progress has been made. The Chinese have been handicapped by the monsoon weather, which has turned all roads and trails into mud, and has made supply difficult.

The Nicobar Islands

These lie some 200 miles beyond the north tip of Sumatra. A British Task Force including battleships and aircraft carriers attacked these islands for two days, commencing 17 Oct. The island of Car Nicobar, the northern one of the chain, was shelled and bombed. Nicobar Island was bombed. At the latter island is the magnificent Nancowry Harbor, suitable for a naval base. The Task Force only lost 4 planes. As this account closes the attack is still in progress.

SOUTHWEST PACIFIC (19 Sep to Oct 44)

NOTE: All dates in this section are local, or east longitude dates. USN communiques are ordinarily in west longitude time, which makes their dates one day earlier than standard.

This area includes a vast number of islands, of which the Philippines and the Dutch East Indies are the most important. Major activity was the preparation of an expedition for invasion of the Philippines, which however had not occurred (although on the way) by 18 Oct. No other important military operations were undertaken.

A very active air campaign was daily maintained against enemy bases, and particularly air fields, and shipping. A special effort was made to destroy the enemy's oil wells and refinery near Balikpapan, Borneo. This was repeatedly and heavily bombed. The wells are inland, but the refinery is on the coast. The oil can be used for fuel without refining. Oil from the wells is normally brought to the coast by pipe line. It can also be transported by motor tank launches, which used to be the usual way.

The air campaign has sunk a large number of Japanese barges and ships. The ships are generally small, not exceeding 1,000 tons. Barges are widely used by the Japanese. The most common kind is about 50 feet long, has a Diesel engine providing a speed of 9 m.p.h. in ordinary weather, and carries a crew of 7. Three barges a day is reported as sufficient to supply a Jap division. Barges lay up in the day in coves or any available location and travel by night. Australian reports state that the enemy is employing 15,000 of these barges. Many are sunk, but others undoubtedly get through.

Japanese submarine barges are also in use for routes where it is impracticable for barges to find shelter by day. There is very little information as to the number of these. It is rare that one is reported sunk.

Japanese bases in this area important at this time are:

on Celebes:	**Makassar; Kendari; Menado.**
Halmahera:	**Kaoe; Boeli; Ternate—Tidore.**
Boeroe:	**Namlea.**
Ceram:	**Liang—Amboina; Kairulu; Amahua.**
New Guinea:	
north coast	**Manokwari; Wewak; Lae.**
south ocast	**Babo; Kaimana.**
New Britain:	**Rabaul.**
New Ireland:	**Kavieng.**
Bougainville:	**Buka; Shortland Islands.**

The Allies hold bases along the north shore of New Guinea between the Japanese-held territories, the west half of New Britain, and a large beachhead on the west side of Bougainville. From all of these posts planes fly to interrupt the enemy sea lanes of supply.

To points on the north shore of New Guinea and beyond, enemy barge fleets depart nightly from bases further west. They draw only 3 to 4 feet of water, so can cross nearly all reefs.

At night these barges are a small target, are not easily seen by a plane unless it is flying low and in the path of the convoy. If a

convoy is intercepted the barges scatter. As the planes seldom have enough bombs to chase all of the barges, usually a number get by. This system has kept a number of Japanese detached posts from starvation and has supplied them with ammunition and some stores.

NORTH AND CENTRAL PACIFIC AREA

Palau Islands

At the beginning of the period an amphibious expedition had landed the 1st Marine and 81st Inf Divs on Angaur and Peleliu Islands at the south end of the group, and had almost occupied both of these islands.

Principal enemy resistance was on Peleliu, where the Japs were dug in deeply and closely. The weather was very hot—men used as many as 20 salt tablets a day. The Japs were supplied at night by barges which were run ashore. Extensive mangrove swamps along the coast limited the fighting areas.

On 21 Sep the 1st Marine Div attacked the enemy on a ridge along the west side of Peleliu. Although the attack was continued on the following day no appreciable progress was made. During the balance of Sep a small advance was gained and more than three-quarters of the island was occupied, the enemy being penned in the north end.

The offensive was continued. The enemy-held ridge became known as Bloody Nose Ridge. Progress was very slow and was indeed bloody. The enemy was partly in caves, partly in well constructed trenches. A similar situation, on a much smaller scale, existed on Angaur. By 7 Oct, the enemy's estimated death losses were 11,083 on Peleliu and 1,128 on Angaur. 214 prisoners had been captured.

A new attack was made on 8 Oct, after an air preparation using 1,000-lb. bombs. It failed to have much success. At the end of the period the enemy still held his positions on Peleliu and Angaur.

Central Pacific Area

American troops from Palau occupied Ulithi on 20 and 21 Sep. There was no opposition. The enemy had already abandoned this island group.

In the Caroline Islands Yap, Truk, Puluwat, and Ponape have been repeatedly bombed. In the Marshall Islands the Jap bases at Maloelap, Mili, Wotje, and Jaluit have been also bombed. Pilots report that Japanese AA fire has increased in volume and accuracy. These Jap-held islands are reported as supplied by submarines having a cargo capacity of 400 tons. There are also small Jap subs which carry 35 to 40 tons of cargo, including deck loads lashed on.

North Pacific Area

Operations have been limited to occasional bombing of Marcus, Wake, and Paramushiro. Mission of the bombings is to neutralize the enemy air bases and thereby interfere with his air reconnaissance. Dates of bombing are adjusted to fleet operations, when it is desired to prevent the enemy from learning the whereabouts of our ships.

Operations of the Pacific Fleet

The Pacific Fleet, now of vast size, is divided into sub-fleets which are numbered. They contain numerous airplane carriers. Fleets have trains, which maintain a supply system enabling combat vessels to remain at sea for considerable periods. Operations of the Fleet have been the main military operation in the Pacific.

On 21 Sep the 3d Fleet arrived east of Luzon. It launched about 500 planes which made two attacks, one in the morning and the other in the afternoon, over Manila and adjacent air and naval bases, including Cavite, Subic Bay, and Clark and Nichols air fields. Another attack was delivered next day. The reported result was the sinking of 51 ships, only one of which was a naval vessel (a destroyer), and the damaging of 58 ships, one of which was a destroyer. Two floating dry docks were damaged. 169 enemy planes were reported downed, plus 188 destroyed on the ground. American losses were 26 planes.

On 10 Oct the same fleet (Vice Admiral Marc A. Mitscher) was off Luzon Strait. An air sweep was made over the Ryukyu Islands seeking out all enemy vessels. Five were sunk including 1 destroyer, and 24 (mostly small vessels) were damaged. 19 enemy planes were downed in air fights and 75 were reported destroyed on the ground. In the Ryukyu Islands the enemy has a main base on Okinawa Island, near the south end of the chain.

Oct 10th American carrier planes took the Japanese by surprise in a strike at the Ryukyu Islands (1). They sank or damaged 58 vessels and destroyed 89 planes, 75 of them on the ground. To the south, American fighter planes and PT-boats smashed 18 barges trying to reinforce the Japanese on Morotai (2). Liberators bombed Kupang on Timor (3).

The same command on 12 Oct attacked Taiwan (Formosa) in all day raids from 0700 until 1500 hrs. An estimated 1,000 planes were used, which is a record for a sea-borne expedition. This attack was continued on the 13th. The Japanese air force discovered the ships, and attacked. They also engaged in air fights with the American planes. Net result was that the Japanese are reported to have lost in the 2 days 221 planes downed plus 175 destroyed on the ground. 27 Japanese ships were sunk and 36 others damaged. American losses were 45 planes, with no ships lost. On the last day the American attack was extended to the Pescadores Islands just west of Taiwan, where the enemy has another naval base at Mako.

On 14 Oct the 20th Air Force (flying from China fields) continued the attack on Taiwan, centering on the Okayama air base. Two super-bombers were lost. The 3d Fleet made minor attacks this day and included Aparri, on Luzon. 11 enemy planes were downed, 30 more were reported destroyed on the ground. The Jap air force again attacked the ships during the afternoon, losing 30 planes. The 20th Air Force again attacked Taiwan Einansho airfield on the 17th.

On 15 Oct another fleet, the 7th, was east of Luzon and sent its planes out to attack the vicinity of Manila. These planes were intercepted but the American planes were not stopped—they bombed the airfields near Manila and attacked other targets. Meanwhile Japanese planes attacked both American fleets to the east of Luzon and Taiwan, and continued again next day.

To include 16 Oct the American fleet reported that the total loss inflicted on the enemy since 10 Oct was

planes downed near ships	**256**
downed near targets	**269**
destroyed on ground	**350**
total	**875**

The enemy also lost at least 5 ships sunk and 32 damaged, nearly all small. American loss was 21 planes and reported superficial damage to ships.

On 18 Oct air raids were renewed over the Philippines, to include Aparri and Lauag airfields at the north end of Luzon; Camiguin Island near northeast corner of Mindanao; Mabalacat, Angeles, and Tarlac on the Luzon plain; Manila and Legaspi at the south end of Luzon.

JAPAN

Extensive steel works near Anshan, Manchukuo, were bombed by the 20th Air Force on 26 Sep.

CHINA

Chekiang

On 20 Sep a Japanese land force reached the coast and captured Wenchow (Yunkia on some maps). Chekiang Province appears to be now largely under Japanese control.

Following up the devastating blows at Formosa from the Pacific by American carrier planes, the biggest force of Superfortresses yet sent out smashed at Okayama (1), vital repair base and supply depot. The Chinese, however, suffered more setbacks as the Japanese driving for Kweilin captured Kweiping (2) and pushed north from Pingnam and south near Pinglo (3). No further progress by the enemy troops advancing down the Hunan-Kwangsi railway (4) is reported.

Fukien

A Japanese amphibious expedition on 27 Sep landed on the north side of the Min River. Later other forces landed on the south sidz. They attacked and defeated the 88th China Div stationed in that vicinity. Then they occupied the important port of Foochow (Minhow on some maps).

Occupation of Wenchow and Foochow affords the Japanese sites for airfields from which Taiwan can be covered. It also strengthens Japanese economic control of China by closing two heretofore open ports.

Hunan—Kwangsi

Since May a Japanese expedition has traversed all of Hunan and on 18 Sep had entered adjacent Kwangsi with axis of advance along the Kwei River. Leading elements were 9 miles northeast of Hingan. It was expected that the Japanese would advance rapidly, and in view of this the 14th U. S. Air Force abandoned its base near Kweilin. The Japanese advanced very slowly, however. By 18 Oct they had passed Hingan and established posts in the hills to each side, blocking roads into the Kwei valley. Through this they were constructing substantial roads. There is a railroad in the valley, but no information as to whether the enemy is reconditioning it.

South Kwangsi

Still another Japanese column based on Canton had moved west on both sides of the Si (West) River, and on 19 Sep entered Kwangsi with its point 28 miles west of Wuchow. During the period this force, working on both sides of the river, has advanced 65 air miles to beyond Kweiping. This advance forced the 14th U. S. Air Force to abandon their base at Kweiping.

14th U. S. Air Force

Due to Japanese ground advances this command has lost a string of fields in southeast China and has only one good field left, near Luchow. This happens to be about the same air distance—95 miles—from the abandoned bases at Kweilin and Kweiping. This field is now doing the work of about 6, and is extremely busy. During the day there is no enemy interference, but at night the field is bombed regularly. It nevertheless does a tremendous amount of work. The 14th Air Force has uninterruptedly continued its extensive bombing program against Japanese shipping in the China Sea, enemy air fields and lines of communication in southeast China, Indochina, and occasionally in Thailand. All bombs, ammunition, spare parts, gasoline, and oil needed is flown in from India.

A special effort has been made to support Chinese ground troops opposing the Japanese advance. Daily attacks against enemy troops and trains undoubtedly have slowed his progress.

FIELD ARTILLERY SONG

(South Pacific Style)

(1) Over salt, over sand,
We have hit the jungle land
With our caissons and horses—long gone.
In the storm, in the night,
105's blast out our might
With our caissons and horses—long gone.

(2) Over reef and coral shore
We will hit the Nip some more
With our caissons and horses—long gone.
If our 6 × 6's stick
We'll winch 'em out mighty quick
With our caissons and horses—long gone.

(Chorus) And it's hi, hi, he
We unload our LST
Our rations and Ammo
Off by dawn—(*Heave Ho*)
And wher'ere we go
Till we get to Tokyo
We'll be blastin' those Nips
From now on.

Parody by LT. IVERS L. FUNK

BITTER LESSONS

By Lt. Col. Joseph R. Couch, FA

It has been written that a man learns by two methods: first, by his own experiences; secondly, by the experiences of others. The man who is wise will endeavor by study, work, and observation to learn all *bitter* and *dangerous* lessons from the experiences of others. This is doubly necessary for the soldier. Battle experiences are costly, and mistakes are often fatal.

During the North African, Sicilian, and Italian campaigns our battalion of 155-mm M-1 Howitzers, Corps Artillery, has learned many lessons. Those etched most deeply into our minds have been paid for by the blood of our own men. Many others have been brought sharply to our attention by the costly mistakes of other units.

This article is written not to excuse nor condone our mistakes, but to give others an opportunity to avoid similar bitter lessons.

In March, 1943, at El Guettar, the American forces attacking Rommel's stubborn flank guard were subjected to frequent and intensive air attacks. Strict defense measures, both active and passive, were a vital matter of life and death.

Shortly after occupying a position three miles east of the Oasis on March 21 we were attacked savagely twice, in rapid succession, by enemy aircraft. We were inexperienced to the shock and sound of battle. The thunder of the bombs and the noise of our ack-ack were terrifying and ominous. Our casualties were two killed and eight wounded, including part of an attached AA gun crew who suffered a direct hit in their gun pit. Materiel losses were one AA gun destroyed, three trucks damaged.

Losing no time, we inspected our defenses, dug foxholes deeper, relocated some vehicles and began to dig them in. Machine gunners improved their pits and were further instructed as to alerts, aircraft identification, and fire discipline. Small arms were stacked near foxholes, and loaded: magazines and bolts have a maddening habit of jamming when the owner is under stress. We reemphasized our others for proper dispersion of personnel; this included no chow lines and no gathering of men into groups.

During the week that followed we were repeatedly bombed and strafed. Two wounded and one whose nerves cracked under the strain were the sum of our casualties. Fragments and bullets passed through tops and doors of some vehicles, but none were destroyed. Our baptism by fire had taught its lesson.

155-mm M1 howitzer in position below Cassino. "Effective camouflage is among the best means of air defense."

"In combat all ranks dig—and cheerfully"

* * *

One afternoon during this same period at El Guettar another unit emplaced a battery on our imediate right. They were warned of the suddenness and strength of German air attacks in this sector. The afternoon was warm and sunny and relatively quiet. Inexperienced soldiers are often lulled into a false sense of security during quiet periods.

At supper time we noted with alarm that the battery was employing a "regulation" GI chow line. Mess kits glittered in the sun, and the soldiers crowded close to the kitchen truck.

There was no time to warn them again before a flight of MEs, flying low, roared over the mountain on our left. Bofors and machine guns opened fire. The ground trembled under heavy bomb explosions. The damage to our battalion was none—but our ambulance helped the battery on our right. A near miss on the chow line resulted in six men killed and wounded. The lesson was a hard one, but this battery employed no more mess lines in that position.

* * *

Again at El Guettar in March, 1943, German aircraft began the nerve-racking habit of flying over our positions at night. Usually a single plane would fly low over our area and drop flares. Then it would strafe and bomb any activity noted in the sector. Very strict discipline among all troops was vitally necessary. No lights of any type were allowed to be exposed. There could be no smoking. When the flares were dropped all men were to be under cover and to freeze in position. No firing by any type of weapon—except by heavy AA guns—was permitted.

One night enemy planes came over repeatedly. Flares were dropped again and again. Nerves were strained as we remained quiet and waited anxiously for each plane to pass on. Finally a machine gunner in a tank company about 500 yards to our right rear could restrain his trigger finger no longer. He fired burst after burst at the sound of the motor. The German plane dived over the position of the machine gun and dropped a heavy bomb in the tank company area. We never learned how many casualties resulted in the darkness and confusion. This frightened or poorly-instructed soldier endangered the lives of many.

* * *

When we first went into action in Tunisia mine warfare was a relatively new subject to American troops. In our assembly area before moving into the lines our attention was called sharply to our deficiencies in mine warfare when several vehicles from the division to which we were attached struck mines with disastrous results.

Our first step toward the problem was to instruct all personnel, especially vehicle drivers, in recognition and identification of mine fields. Next we made certain that a number of men in the battalion were able to employ the mine detector and to disarm mines. Lastly we sandbagged all vehicles to reduce casualties should a mine be struck.

The time and labor so expended paid enormous dividends. Repeatedly our men navigated mined areas safely. We did have some casualties due to mines, but they were not large. On one occasion the battalion motor officer struck an antitank mine while riding in a jeep. He was blown high into the air, but escaped with minor scratches. The jeep was demolished, the sandbags in the vehicle were riddled with fragments, but the officer lived because he had learned from the experiences of others.

* * *

It was November, 1943, in Central Italy. Near the Volturno River the 34th US Inf Div, whom we were supporting, had broken through a defensive zone and crossed to the west side of the river. Heavy mine fields guarded the German lines. The waves of infantry crossing the river in the rain and darkness suffered many casualties from the mines in spite of valiant work by the engineers.

On the third day of the attack the enemy had retired into the hills to their rear. Our battalion was ordered to ford the swollen river and occupy a position then being vacated by a 105-mm battalion. Though the area had already been swept by the engineers and occupied by the light battalion, it appeared dangerous. Employing our mine detectors, we located and removed 12 S-mines. The position was then occupied deliberately and carefully without mishap.

Near our right-flank battery was a vacant farmhouse which had been taped off by the engineers. The battery commander warned his men to stay clear of the place. Toward evening four soldiers of the battery disregarded their instructions and decided to sleep in the house. Heavy rains were falling; the house looked dry and inviting.

As the men approached the house one of them stepped on an S-mine buried near a well. There was a deafening report, and aid men hurried toward the sound. One soldier was killed and two were wounded. This was one of our most tragic lessons, for these men paid a great price for useless and foolish actions.

* * *

When vehicles moving on a road behind the front lines are taken under fire by enemy artillery their best procedure is to keep moving at a rapid rate until out of the zone of fire. Obviously there are exceptions to any rule, but the law of probability works in favor of a moving target. Officers and men need to be schooled in such matters, for under fire an untrained soldier will usually become panic-stricken and obey the fundamental law of self-preservation—not intelligently, but purely by instinct.

Near Cerasuolo in February, 1944, a supply truck of our battalion was travelling along a road, parts of which were exposed to enemy observation. As the vehicle approached an exposed stretch it was taken under fire by a single enemy gun. Shorts and overs were obtained on the vehicle. The frightened driver disregarded his previous instructions and halted his truck on the road. When it stopped the enemy observer merely split his bracket until he obtained a direct hit. Had the vehicle continued to move it would have escaped untouched, for the German gunner was slow and deliberate with his adjustment. Luckily the occupants escaped injury, but a valuable vehicle was destroyed.

* * *

During October, 1943, in Central Italy our battalion was supporting the 34th US Inf Div in pursuit of the Germans from the lower Volturno River north to the famed Gustav Line. The pace was rapid and exhausting. Displacements were numerous. We fired constantly day after day. Frequently the retreating enemy halted for short periods and counterattacked savagely. At such times enemy observers skillfully chose high ground in order to deliver effective counterbattery fire.

Occupying a position near Raviscanina, we found complete defilade impossible. We noted that a German-held hill overlooked the position of our left-flank battery. Fire was needed to support our attack early the next morning. There was no time for delay nor to change position. Orders were issued to the exposed battery to dig in thoroughly and to camouflage carefully.

One soldier delayed in digging his trench. He was fatigued. It had been a hard day, and he had found no use for a trench for several days past. Occupied with the task of getting his gun ready to fire, the Chief of Section overlooked the soldier's laziness.

Scarcely had our battery opened fire when it received an immediate answer in the form of enemy counterbattery fire. Personnel of the battery took cover—all except the soldier who had none. He could only lie flat on the ground. We had difficulty in locating the German battery, which fired many rounds before being silenced. Our only casualty was the soldier who had failed to dig his trench: he was killed instantly by one of the enemy shells. We have never forgotten this lesson—paid for by the highest price, human life.

NOTICE OF ANNUAL MEETING, U. S. FIELD ARTILLERY ASSOCIATION

In compliance with Article VII, Section 1, of the Constitution, notice is hereby given that the Executive Council has fixed 5:30 P. M., Monday, December 18, 1944, as the time of the annual meeting of the Association to be held at the Army and Navy Club, 1627 Eye St., N. W., Washington, D. C.

The business to be disposed of will be the election of three members of the Executive Council (two Regular Army and one Organized Reserve), and the transaction of such other business as may properly come before the meeting. Nominations may be made by proxy, or from the floor of the meeting.

TRENDS in Field Artillery Organization & Equipment

Wire W-110-B is replacing W-130-A in gun and howitzer batteries. Gun and howitzer batteries are the only Field Artillery units which are equipped entirely with light wire. Combat experience has shown the superiority of the heavy wire W-110-B over the light wire W-130-A for general purpose communication. The new allowances are 4 miles of W-110-B on DR-5, 2½ miles of W-110-B on DR-4, and 2 miles of W-130-A on DR-8. The former allowance was 10 miles of W-130-A. The authorization of 2 miles of W-130-A on DR-8 for forward observer sections remains unchanged. One trailer, ¼-ton, is added to each gun or howitzer battery to transport the increased wire load. In order to provide light wire in certain theaters where it might be desired, W-130-A may be substituted for W-110-B outside continental United States when authorized by theater of operations commander. Headquarters battery, Division Artillery, Infantry Division, Group, Brigade, and Corps Artillery are increased by 1 trailer, 1-ton, 2-wheel, cargo and 10 miles of Wire, W-110-B on Reel DR-5. Trailers will be towed by organic wire vehicles. The wire in battalion headquarters batteries is not altered.

Field Artillery Group and Brigade headquarters have been augmented by the addition of a supply and administrative section. Army Ground Forces Groups and Brigades, which are all built on the same general plan, did not have administrative functions. However, combat experience showed the need for such personnel. Revisions to T/O & E 6-12 and 6-20-1 incorporating these changes are now in the hands of The Adjutant General for publication and distribution. Both organizations are authorized an assistant S-4, S-1, sergeant major, technical sergeant (personnel), and four (4) additional clerks. In addition, the Brigade is authorized a master sergeant (supply). No additional transportation is included. Some cargo space was provided by the reduction of basics. In the group headquarters, the change of the command post truck from a weapons carrier to truck, 2½-ton, furnishes additional carrying space. One more typewriter, non-portable, is also authorized.

Each rifle company, T/O & E 7-17, in the infantry regiment is to be authorized by a published change, an additional Radio Set SCR-536 earmarked for use by the Field Artillery forward observer. This set is intended for communication between forward observers and the supported infantry units. Field Artillery unit commanders should contact their supported infantry units to arrange for the issue of these sets as soon as they are available.

One (1) gun, submachine, cal. .45, M3, is authorized each gun or howitzer battery. It is being included in T/O & E in addition to other weapons as organizational equipment. The observation battery is authorized two (2) of these weapons.

Message books have changed from Adjutant General to Signal Corps responsibility. Army Service Forces Catalog SIG 4-1 and 4-2 will carry the basis of issue of these books.

The grade of the assistant S-2, reconnaissance and survey officer, in Headquarters Division Artillery of the Infantry, Armored, Cavalry, Mountain, and Airborne Divisions, has been raised from first lieutenant to captain.

A forward observer section similar to that used in the Infantry Division artillery is also authorized to the 75-mm field howitzer, horse, battery, T/O & E 6-117, when part of Cavalry Division Artillery.

Remote control equipment has been carried on the basis of one (1) per Radio Set SCR-619 (610). This allowance provided a set for each radio mounted in airplanes, which in effect provided two (2) spare remote controls per battalion for the use of the parent unit. Supply of remote controls is such that these spares are no longer necessary. The remote controls for airplane radios are being deleted from tables.

The Goggle, M1943, with a cloth covering for the face and neck, comprise the Mask, face, launcher, rocket, which is to be issued on the basis of one (1) per launcher, rocket, 2.36-inch.

The mount, AA, machine gun, cal. .50, M63, is the standard ground mount for Field Artillery and will replace the mount, tripod, machine gun, cal. .50, M3 (with elevator-cradle). The M63 is a lightweight portable mount primarily for antiaircraft use but is equally effective against ground targets. Machine guns, cal. .30, or cal. .50, are fired by levers on a step arrangement of handles which permits ease of firing in all positions. This mount is interchangeable with tank and automotive mounts and may be delivered by parachute. Total weight of the M63 is 144 lbs.

The newly standardized Carbine, cal. .30, M2, permits semi- and full automatic fire by means of a change lever. It accommodates a 30-round magazine as well as the standard 15-round magazines. The weight is approximately the same as the Carbine, cal. .30, M1. The M2 will replace M1's in Field Artillery units.

The camouflage net set No. 2, M2 in T/O & E for 105-mm and 155-mm howitzer batteries is essentially the same as the camouflage net set No. 2. The new set has greater concealment for working areas, improved technical efficiency and operating facilities.

The Lantern, electric, portable, hand is replaced by the Lantern MX-290/GV. The latter lantern contains two (2) lamps which may be switched on alternately and which are operated from a standard signal corps battery. One lamp provides a wide spread of light and the other a narrow beam. Weight with batteries is 1¾ lbs.; dimensions are: diameter, 3½ inches; height, 6½ inches.

Revised T/O & E's for Infantry Division Artillery (dated 27 September 1944) and Cavalry Division Artillery (dated 30 September 1944) are now being published and distributed by The Adjutant General. The Infantry Division Artillery revision incorporates all published changes and the latest standard equipment; no change is made in the present organization. The organization of the revised Cavalry Division Artillery is changed to conform to the general policy under which all Field Artillery is presently organized. Cavalry Division Artillery was organized under tables of organization. The equipment was authorized in T/BA No. 6 until these T/O & E's were published. Equipment included in the revision authorizes the latest standard items that are available for this type of unit.

Standing operating procedure (SOP) should not be a substitute for training in accepted artillery methods.

COUNTERMORTAR

By Lt. Col. Robert C. Gildart, FA

Reports from all active theaters of operations continue to emphasize the casualty producing effect of enemy infantry mortars and our lack of effective countermortar technique. Recent statistics compiled by the Army Service Forces show that in one campaign against the Japanese in the Solomon Islands, 39% of the casualties were produced by infantry mortar fragments. German mortars have proven equally effective, and, until very recently, there has been no organized effort for "countermortaring" our enemies—despite the fact that field artillery counterbattery technique has been most effective. Born of battle, present countermortar measures rely upon:

1. Knowledge of the characteristics of enemy mortars and the employment thereof.
2. Locating mortars.
3. Use of proper weapons for neutralization or destruction.
4. An organization for assembling, studying, and disseminating enemy mortar information and for controlling the fire thereon.

ENEMY MORTARS AND THEIR EMPLOYMENT

GERMAN

Two types of German mortars have been encountered in all engagements. The 50-mm light mortar—a simple, trigger-fired weapon—is of the usual design. Six of its 2-lb. HE projectiles can be fired in eight seconds at a maximum range of 568 yards and a minimum of 55. This mortar, the organic support weapon of the rifle platoon and rifle company, is often emplaced singly by the Nazis to cover areas of approach into which machine gun fire cannot be directed. It is also employed as a mobile support weapon for supporting counterattacks.

The 81-mm, Model 34, heavy mortar is a weapon quite similar to our own 81-mm M-1. Its rate of fire is the same as that of the light mortar, but with one of four charges it projects a 7¾-lb. HE or smoke shell from 66 to 2,625 yards. This is a battalion weapon, six being organic within the heavy weapons company. Although the normal employment is in pairs, it is known that the Germans have at times concentrated all six mortars in an effort to obtain surprise massed fire.

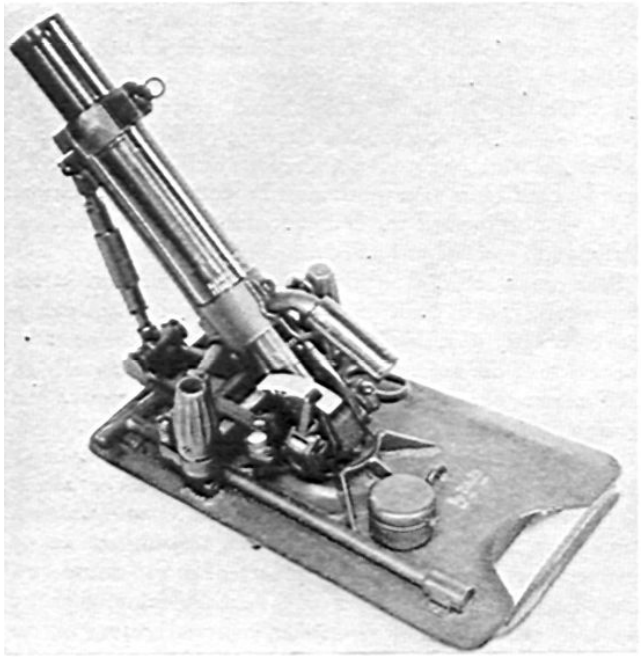


Figure 1. 50-mm light German mortar, M1936 (5-cm LGrW 36).

Figure 2. 81-mm German mortar, M1934 (8-cm GrW 34).

JAPANESE

Japanese mortars have proved similar to German in type and employment. The Jap 50-mm, 10.3-lb., light mortar is in reality a grenade discharger. Its base plate's shape led to an erroneous conclusion early in the war that the weapon could be fired from the knee, hence the Americanism, "Knee Mortar." Actually, the base plate must be placed firmly on the ground, after which the grenade is inserted, the weapon aimed by

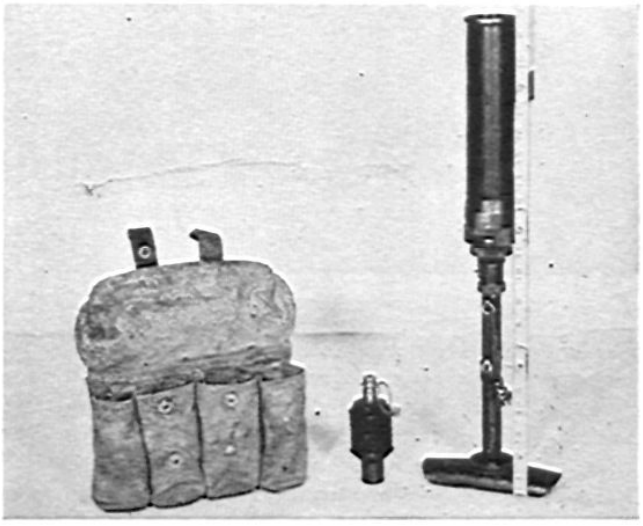


Figure 3. Japanese 50-mm grenade mortar: 4-round carrier, HE fragmentation grenade, and mortar.

sighting down the barrel, and then fired with a trigger mechanism. Throughout its approximate 100- to 500-yard range, Japanese small units employ the weapon with both accuracy and skill.

In the past 81-mm and 90-mm mortars have not been organic within the Japanese infantry regiment. When necessary, trench mortar platoons containing two such mortars

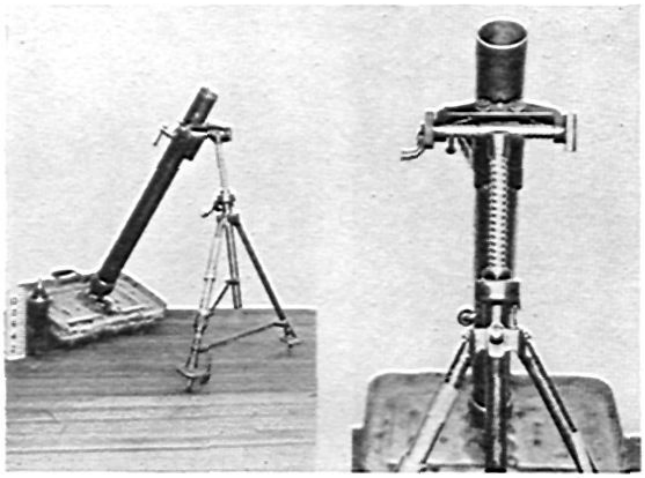


Figure 4. Japanese 81-mm mortar, M1937 (97).

have been attached to the units requiring them. There are two types of Jap 81-mm mortars. The 81-mm, type 99 (1939), is considerably lighter than our own, weighing only 52 lbs. Ammunition for the US (M43 light) and the Japanese weapons are, however, interchangeable—either weapon can fire the projectiles of the other. The enemy mortar fires a 6¾-lb. projectile at ranges between 450 and 2,200 yards. The 81-mm, type 97 (1937) is almost identical with the U. S. 81-mm mortar M1 and could readily be mistaken for it. The ammunition used is the same as that used in the type 99 mortar. These weapons when fired have a relatively loud report and a distinct muzzle flash. The 90-mm mortar also produces a large muzzle flash

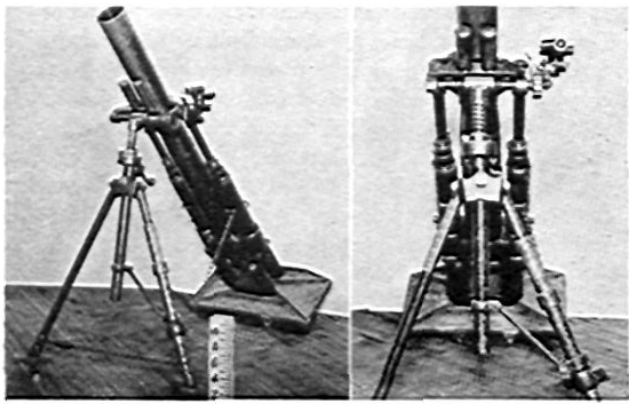


Figure 5. Japanese 90-mm mortar, "M94."

extending about 6 feet beyond the muzzle in daylight, but the noise of firing is not so pronounced as with the 81-mm. Normally, the former fires an 11½-lb. high explosive projectile from approximately 600 to 4,100 yards.

Both the Nazi and the Jap employ their mortars from deep defilade, and both have been known to change positions after firing only a relatively few rounds. In static warfare, however, positions generally become fixed and emphasis is placed on fortification, camouflage, and registration along likely routes of approach. Regardless of their mobility or lack thereof, the above-listed enemy mortars are weapons which must be dealt with more efficiently in the future than they have been in the past.

LOCATING ENEMY MORTARS

Knowledge of enemy mortar characteristics and their employment is essential in solving the most difficult countermortar problem, that of locating the position, or even the area, from which these weapons are firing. Efforts at location to date have combined this knowledge with reports from battery or battalion observation posts, infantry patrols, forward observers, and air OPs; studies of aerial photographs and "shellreps"; and reports of sound and flash ranging units, electronic devices, civilians, and prisoners of war. Each of these listed aids, however, has its strong and weak points which must be thoroughly understood to be interwoven into an enemy mortar location.

OBSERVATION

Field artillery battery and battalion observation posts have been indoctrinated in the necessity for reporting active enemy batteries by observation of either their flash, sound, or smoke. Although the sound and smoke generally produced by a mortar are far less than a gun or howitzer emits, these means have been used to establish the approximate direction from which the mortar was firing. Normally it will be impossible for a ground OP to see the enemy position, but plotted reports from several OPs based on sound, flash, or smoke observation will give a definite area which can be searched for a logical mortar position upon which fire can be placed. The British have reported that even single bearings have provided information "for a careful analysis of the terrain along the line of fire to see where possible mortar positions are located." The drawback, insofar as the two types of tactical OPs under discussion is concerned, is that usually they are far removed from the mortar and consequently see or hear only the shell burst. Training in identifying and reporting active enemy mortars will, however, increase both the accuracy and the number of "Mortreps" submitted by battery and battalion OPs.

Contrasted to static OPs, forward observers are usually sufficiently far forward to hear an active light, and at times a heavy, mortar. If located in the shelled area, the FO can determine by ear the approximate direction of flight of the projectile. As with the battery OPs, reports of FOs will normally produce only a direction which must be studied in conjunction with a map to produce the desired location, which in the final analysis still remains just an educated guess.

Penetrating ahead of artillery forward observers are infantry patrols. These small units, which at times advance deep into enemy territory, should be indoctrinated with the necessity for searching out enemy mortars, locating them accurately on their maps or photographs, and reporting them promptly upon returning to friendly lines.

Air OPs overcome the disadvantage of the ground observation posts' lack of height and the dangers inherent in patrolling. Experience has shown, however, that even with this advantage an air observer has difficulty in locating the enemy mortar unless it is active and the observer has had a suspected area designated to him. Even when actually firing, difficulty has been encountered with German mortars because of the flashless powder used and the fact that the amount of smoke produced usually dissipates after fifteen seconds. Once spotted

from the air, however, map or photographic coordinates can be reported—the mortar is definitely located and accurate, effective fire can be placed on it.

Location of enemy mortars by the use of aerial photographs requires both verticals and obliques. With either type, however, locating an enemy mortar position is far more difficult than locating an enemy battery. Mortars are more mobile and, being smaller, are more easily camouflaged. As a result mortar positions are detected photographically only when the photograph is of a large scale and examined by an expert. One American division has reported that when these conditions are fulfilled, "interpretation . . . was found to be the most prolific source of locations."

Inasmuch as mortar concealment from vertical photographs can be obtained by emplacement in the side of a steep cliff or hill, oblique pictures of suspected position areas taken in the direction of fire of the mortar can be of great assistance to the photo-interpreter. In the overall picture, however, aerial photographs are usually valuable only in static situations or for confirmation of reports from other sources.

Shellreps, or "Mortreps" as some British units have called them when applied to mortars, provide a fair source of information valuable principally when analyzed in conjunction with other methods of location. The normal Shellrep form can be employed, using only those items applicable to mortar firing. One of the most essential items to be reported is the direction from which the fire is coming. This can be determined by ear, but better by an analysis of the shell crater. With this latter method, trials have indicated that direction can be determined with maximum errors under favorable conditions of 4 to 5 degrees. The method employed is simple and quick. Its main disadvantage is that either the mortar would still be firing, in which case the job would be an extremely hazardous one, or else it would probably have moved to an alternate position.

Shell Crater Analysis

In order to make an analysis of the mortar shell crater to determine the direction of fire one must have a knowledge of the appearance of the crater and of the actual technique of finding the desired direction. The shape of the crater is determined by the projectile's angle of fall. A projectile which drops at right angles to the ground will form a circular crater, while a shell striking at angles substantially less than 90º will form an oval one. Therefore, the smaller the angle of fall, or the greater the range at which the projectile was fired, the more the shape of the crater will indicate the direction of flight. The appearance of a typical mortar shell crater is illustrated in Fig. 6. "The following points should be noted:

"*a*. The edge of the crater which is farthest from the mortar has turf undercut (1) while the nearer edge is shorn of growth and very much serrated by splinter grooves (2).

"*b*. The crater when fresh is covered with loose earth, When this is cleared away, the firm inner crater (3), which still shows signs of burning, is revealed.

"*c*. At the bottom of the inner crater and in front of the point of detonation is the point at which the fins and fuze splinters bury themselves to a considerable depth along the line of the trajectory (4).

"*d*. The ground around the crater is serrated by splinter grooves which form a definite pattern, the form of which depends on the angle of descent (fall) of the bomb (shell) in relation to the ground."

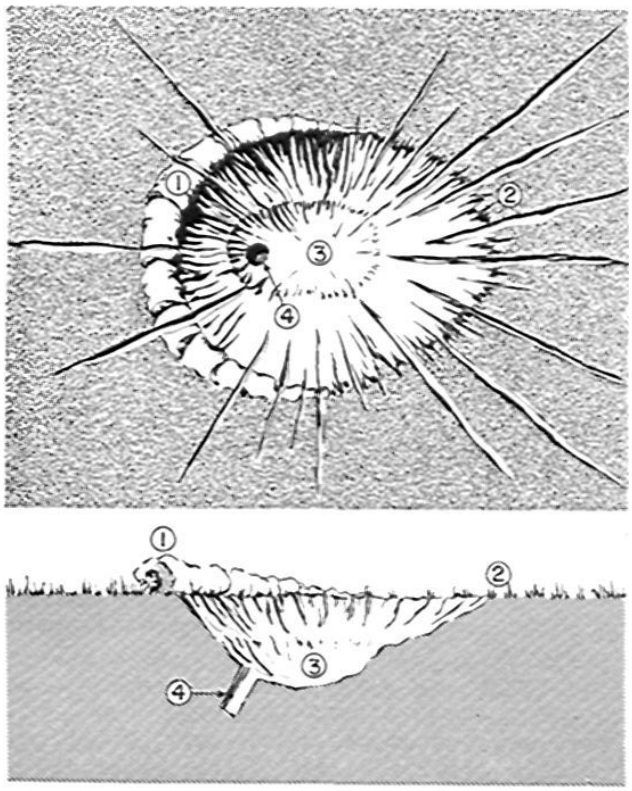


Figure 6

Direction Determination

The above knowledge of the appearance of the crater can now be employed with one or all of three techniques to determine the direction of flight of a projectile with a definite oval crater. The first and most simple method is to examine the oval, determine its long axis, lay a stick along this axis and measure its azimuth with a prismatic compass (see Fig. 7).

Almost as simple, the second method is to examine the far limits of the main splinter grooves which extend in the direction of the mortar. In certain types of terrain the ends of these main grooves will form a straight line perpendicular to the direction of flight of the projectile. By placing a stick along this line, measuring its azimuth and adding or subtracting

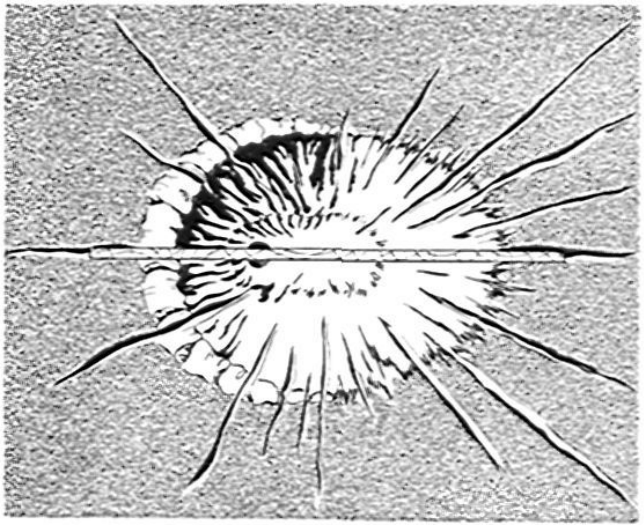


Figure 7

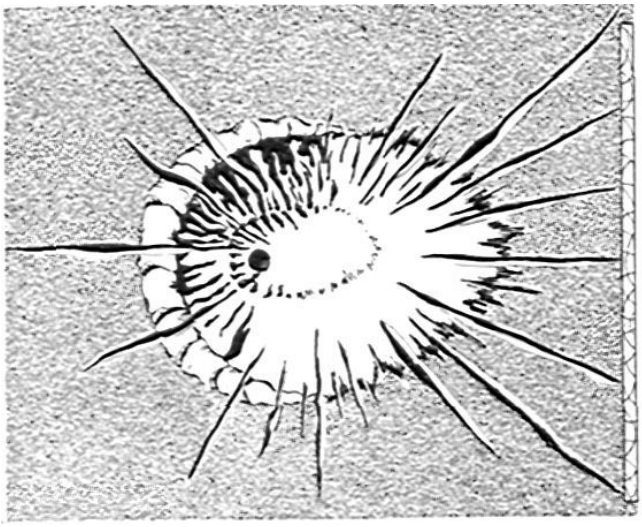


Figure 8

90º as the case may be, the desired direction is determined (see Fig. 8).

Although the most accurate, the third method is more complicated and takes longer than the first two. With this method three distinct operations must be performed: (1) the point of detonation must be determined, (2) the fuze and fin hole must be located, and (3) the direction of the line formed by (1) and (2) must be measured. The point of detonation is the point in the ground at which the explosion occurs. It is also the focal point for shell splinters. Hence, back tracking along the splinter grooves will provide a point of intersection, which point is the point of detonation. A practical method for determining this point is to line in a small stake with the aforementioned grooves. When so aligned, the stake will be directly above the desired point. See Fig. 9. The fuze and fin hole are located under the loose earth covering the bottom of the crater. In soft ground the fins and fuze particles normally will bury themselves at a considerable depth along the line of the trajectory. The hole formed by these particles is the fuze and fin hole. To locate the actual hole, remove the loose earth until the fins are uncovered. In soft ground they may be at the bottom of a small tunnel, in which case care should be taken not to damage the firm sides of the tunnel, as this gives a clue to direction. Upon removal of the fins, the fuze splinters will be found. The third operation in determining the direction from which the mortar was fired is to measure the azimuth between the center of the fuze and fin hole and the point of detonation. This also may be accomplished by laying a stick between the two and measuring its azimuth with a prismatic or other type compass.

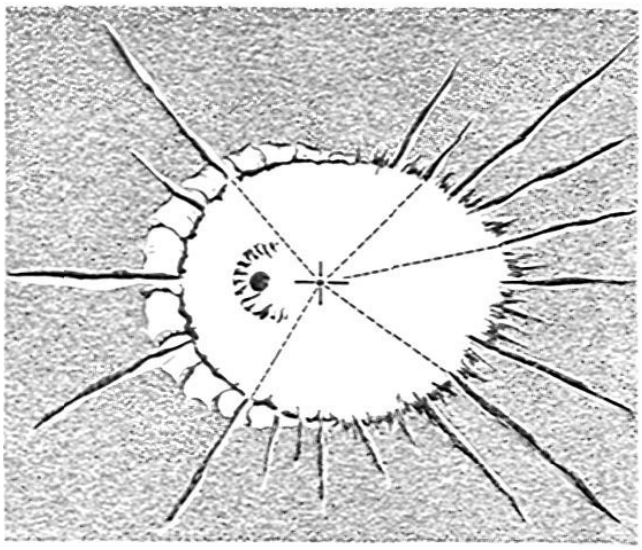


Figure 9

The value of each method outlined in the preceding paragraphs depends upon the type of ground on which the shell explodes, but it will usually be found that direction is best found by a combination of all methods regardless of the type soil encountered. When a number of craters can be examined the mean direction should be taken for as many as possible in the time available.

In the above method for determining direction no allowance has been made for the effect of wind upon the projectile. The direction determined, therefore, is that of the line of flight of the projectile at the end of its travel. A more accurate line from crater to mortar will be found if allowance is made for cross wind. For a light cross wind correct the azimuth from the crater with the wind by 4º, and for a strong cross wind 8º (see Fig. 10).

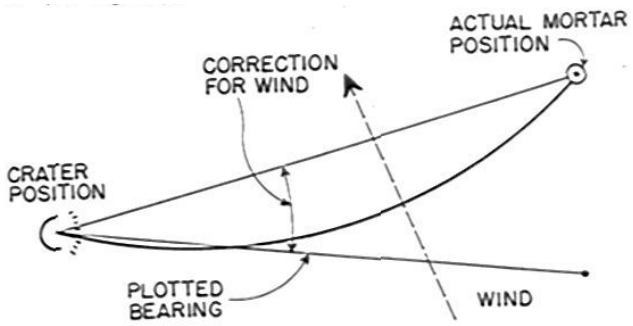


Figure 10

Range Determination

Angle of fall, which approximates the elevation at which the mortar was fired, can also be determined by analysis of the shell crater. This angle, when included in the Shellrep, with the caliber of the mortar can be of value in determining the range at which the mortar was fired. Equipment not usually carried by the individual, however, is necessary—a protractor and a plumb bob (see Fig. 11).

The angle of fall can be found most accurately when the ground is soft and the fins and fuze fragments bury deeply. Find the point of detonation as for finding direction and drive

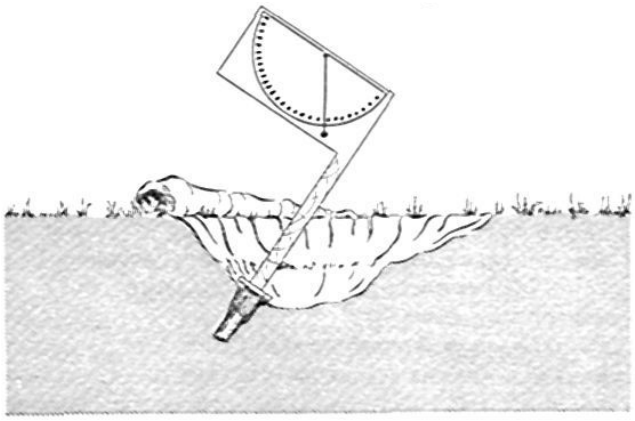


Figure 11

a peg into the crater at this point until the top is about 1″ above the surrounding ground. The top of this peg represents the point of detonation. Find the fins and fuze fragment hole and remove the fins gently. Use the protractor and plumb bob to find the angle of fall from the top of the peg to the center of the fin hole. The mean angle of fall is taken from a number of craters. This angle is assumed to be the angle at which the piece was fired.

Another method for measuring the angle of fall is to leave the fin in the ground, rest the flat surface of the end of a stick against it, and in this way measure the desired angle (see Fig. 12). In sticky soil this method will be necessary for, regardless of how carefully the fin is removed from its hole, a certain amount of soil will adhere to the fin and a poorly defined tunnel will remain. The caliber of the mortar can be determined

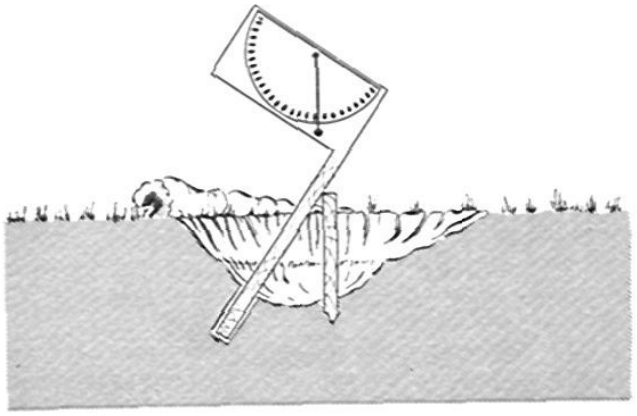


Figure 12

by comparing the fins with pictures available in the technical manuals. Knowing the caliber and the elevation at which the mortar fired, the ranges corresponding thereto can be determined for each charge by consulting the proper range tables (see Fig. 13). For the Japanese 81-mm type 97 a rough firing table can be prepared by deducting 10% from the ranges

RANGE TABLE—GERMAN 81-MM MORTAR

Elevation (mils)	800	900	1000	1100	1200	1300	1400	1500
Charge I			550	500	420	330	230	115
Charge II	1100	1080	1010	915	770	610	420	
Charge III	1600	1580	1490	1340	1140	895	650	
Charge IV	2100	2050	1930	1740	1480	1180		

Figure 13

given for the M43 and M43A1 ammunition in the U. S. 81-mm mortar. These ranges can then be plotted along the mean direction found and an examination made of possible mortar positions, eliminating any that are obviously impossible.

Although both direction and elevation are valuable parts of the Shellrep, they are of little use if the map coordinates of the crater itself are not reported. These can be determined quickly by inspection or inspection in conjunction with a short compass traverse. If map coordinates cannot be determined on the spot, locations can at times be determined on aerial photographs and the resultant photographic coordinates reported. A Shellrep containing either of the above types of coordinates, the direction of fire, and angle of fall, is a great asset in locating an enemy mortar position.

SOUND AND FLASH RANGING

Probably the most accurate aid now generally available to front line troops in solving the problem of mortar location is the Field Artillery Observation Battalion. Its normal employment in the location of hostile batteries, however, does not lend itself to mortar location. Generally, bases established for operation in the U. S. Army are too far to the rear to function efficiently against mortars: flash sections cannot always see the well defiladed flash of the mortar, and sound sections have difficulty, because of other intervening battlefield noises, in picking up an active mortar. The Russians, on the other hand, met with success in locating mortars with their artillery reconnaissance battalion, a unit similar to the American observation battalion. In an article entitled "Artillery in the Breakthrough of a Defense Zone" in the *Artilleriiskii Zhurnal* for January, 1943, Maj. Gen. Samsonov of the Soviet Army states, "The reconnaissance battalion of the army artillery located the position of 54 guns and howitzers and 38 mortars out of expected totals of 66 and 141 respectively."* To date, however, sound location of mortars with our present equipment has not produced the full results desired.

Sound, although the most common, is not the sole non-visual means of locating the heavier enemy weapons. Many varied types of electronic devices have been designed and tested with the hope that from this source will come a real solution to the location of enemy mortars.

Contrasted to the timely information obtainable by both electronic and sound equipment is that obtained from prisoners of war and civilians in the theater of operations. One report from overseas has stated that "prisoners of war, deserters, and civilians are useful, however, in spite of the staleness of their information. Accuracy is usually good."

It is obvious, then, that no one type of report can be relied upon, but that each has its strong and its weak points which must be analyzed and combined to reveal a true mortar location upon which effective fire can be placed.

COUNTERMORTAR WEAPONS AND TECHNIQUE OF FIRE

Coordinates of the mortar area having been determined, the question arises as to what weapons to employ for neutralization. Three are possible: air, artillery, and mortars. All have been used in the past.

Use of the Air Corps as a countermortar weapon has only a limited application. Air bombardment is not normally employed within effective artillery range. All mortars will usually be within this range. Air, however, can bomb the reverse slopes where mortar positions are found. The difficulty in such an operation arises in the identification of the target. The pilot must be furnished a photograph of the area to be bombed, for he will be unable to spot the mortar itself. Even then, with enemy mortars emplaced close to friendly troops and with the plane flying toward these troops to hit reverse slopes, it will be difficult to keep some bombs from landing within our lines. Further, with the prearrangement necessary in such a bombing mission it will be quite possible that the enemy mortar will have displaced from the position designated to the pilot. Air bombardment will normally, therefore, not be an effective weapon in such neutralization missions.

Artillery, though an excellent weapon for countermortar fire, has certain limitations, especially when fire on light mortars

**Military Review*, C & GS School, August, 1944.

is desired. The maximum range of both the German and the Jap 50-mm mortar is under 600 yards. Its emplacement will therefore, at the maximum, be only two to three hundred yards from our own troops. Fire on a target so located with the time or high angle fire necessary for effective neutralization of the enemy position will be hazardous insofar as our own troops are concerned. On the other hand, with artillery no prearrangement is necessary and, if safety considerations permit, the efficient artillery fire direction organization can be utilized for surprise neutralization of the target area. One armored artillery battalion has overcome the safety difficulties in an agreement with its supported infantry. It reports, "Infantry did not want artillery fire too close (not less than 200 yards). Also, firing in that close did not silence the mortars. It was agreed that by firing approximately 400 yards from the front line units the mortar fire ceased. It was believed also that fire at this range prohibited enemy observation for mortar and artillery fire." With proper coordination artillery can be employed effectively in most countermortar missions.

Perhaps the best weapon to employ against the enemy mortars are our own, the 4.2″ firing HE shell and the 81-mm. They can be emplaced so as to be relatively safe in delivering close-in fires and, if properly organized, can have the same surprise and devastating effect as does the artillery. For best performance the chemical battalion must be trained thoroughly in artillery methods; the position area must be located on a firing chart, preferably that of the artillery; and a complete communication system (both wire and radio) must be installed. All of the foregoing is accomplished most satisfactorily if the battalion with its 48 mortars is attached to the division artillery for its countermortar role and subsequently given reinforcing missions with the direct support battalions. Each company (12 mortars) should be capable of exercising fire direction for its own 3 platoons. An alternate solution is to maintain a centralized organization under the chemical battalion with the battalion attached to the artillery and kept in a general support role. Between these two solutions are many combinations which can be employed to meet special situations.

Chemical mortars should not, however, be considered as the only mortar capable of firing in a countermortar role. Americans and British have both employed infantry mortars as well. One Canadian group formed for this role reports, "In particular we are pleased that our mortars will now have an opportunity to be used in a role for which they are best suited, namely to neutralize enemy mortar positions and to fire on definite targets. A lot of ammunition has been expended in harassing shoots to little or no avail at times; and so it is with interest that we join forces with the artillery and take advantage of their facilities. . . ."

Assuming from the foregoing discussion that air bombardment will be of little value but that artillery and mortars will play the principal part in countermortar work, what items of technique of fire must be considered? First, the area location of the mortar and the absence of visual observation thereon will limit fire to that of the area or neutralization type. Occasionally, when located by a sound ranging unit, an adjustment can be made by "sound on sound." Ordinarily, however, unobserved transfers will be the rule unless aerial observation is available for adjustment of either artillery or mortars on a given area. The resultant fire in this case will still be only neutralization fire.

A second consideration of technique is the type of fire to be employed—high angle or low angle, time or percussion? It is obvious that low angle percussion will not reach a defiladed mortar position. In certain types of terrain, however, little defilade is available, in which case low angle percussion fire could be employed if the mortar is not dug in. Usually the enemy will have defilade or entrenchments—or both. In the first and third cases high angle percussion or low angle time fire will be necessary, while in the second case (with no defilade) low angle time or ricochet should suffice for neutralization.

Regardless of the weapon employed or the technique used, countermortar fire will ordinarily only neutralize and must therefore be sustained if neutralization is to be maintained.

COUNTERMORTAR ORGANIZATION

To date two overlapping theories of countermortar organization have emerged from combat, the British and the American. Although neither has become definitely set or crystalized, both will be discussed.

The British consider that an organization comparable to the corps counterbattery staff is required to deal with the mortar problem. They feel that the following principles should be adhered to in the organization of any countermortar (CM) section:

(1). The essence of effective mortar neutralization is speed. It follows, therefore, that part of the CM organization must be decentralized to the infantry brigade (U. S. Regt) level, where, alone, rapid communications exist between the sources of mortar information and the means of immediate neutralization.

(2). A central CM office is required in each division to collect and interpret all available mortar intelligence and to coordinate countermortar measures within the division and from outside resources.

(3). Countermortar work should not be made the part-time occupation of officers on existing regimental staffs. Both at brigade and divisional levels, separate CM staffs are required.

(4). Since the bulk of mortar neutralization will be carried out by the artillery, and since technical methods of location will involve survey problems, the CM organization should be a gunner (artillery) one.

Applying these principles, a tentative organization has been adopted by several divisions as follows:

At division artillery headquarters:
1 Countermortar officer (CMO)
1 Assistant Countermortar officer (ACMO)
4 Clerks

At brigade headquarters:
1 ACMO
1 Officer from supporting mortar companies
2 Clerks

With front line infantry:
2 CM OPs per inf bn spaced at least 500 yds apart.

Reports received by the above organization are termed Mortreps, and include the time for firing, the OP making the report, and the grid bearing determined. "If reports received at the brigade CM office give an intersection, or point to a known position, the brigade CMO will take action and arrange for immediate countermortar fire if desired by the brigade commander." If no intersection is obtained, "the Mortrep will be passed at once to the division artillery CMO. All Mortreps must eventually be sent to division artillery," where permanent

CM records are maintained and fire delivered as early as practicable on those enemy mortars not neutralized by the brigade CMOs. Division artillery in one Canadian division also maintains an air observer with a Cub plane for countermortar duties. "He keeps close touch with the CMO and marks his maps and photographs with all the latest mortar information. He can register on the likely mortar areas, and is ready to carry out CM shoots at short notice. The fire procedure is very similar to the normal artillery method." The British organization appears sound and, with minor improvements acquired in combat, should become a permanent fixture to British tables of organization.

Our own countermortar sections differ from the British primarily in that American artillerymen adhere to a theory that no additions are necessary to present T/O's to provide for a countermortar organization. Perhaps this is because Americans have not yet come to appreciate the full seriousness of the problem. U. S. divisions, therefore, have superimposed countermortar functions on the present divisional artillery organization. "Like the counterbattery system, the CM program operates through the medium of shell reports from all units in the division. The standard artillery Shellrep form is used and a daily enemy mortar list published. Approximately half the missions are assigned to the division artillery and the remainder to the 4.2″ mortars, which have their positions surveyed in, are checked by registration." In effect, American units have established a miniature counterbattery section within the presently organized divisional artillery.

Considering the merits of both the British and American systems, it would appear that for U. S. divisions a mixture of the two systems could be employed effectively. The division artillery S-3 and S-2 could assume the added burden of CMO and ACMO respectively, with one artillery observation plane assigned countermortar duties. To further CM efforts below the division artillery level, the British system of having an officer at the regimental headquarters should be adopted. This officer could serve as liaison officer as well as an assistant countermortar officer. His duties would be similar to those of his British counterpart—to collect mortar information within the regiment and if possible to arrange immediate neutralization fire. Insofar as OPs for rendering the necessary reports to regimental ACMOs are concerned, it is believed that present forward observer sections plus a well trained infantry, indoctrinated with the necessity for reporting, will be able to furnish the information desired. In any CM organization, however—British, American, or combined—training is of utmost importance if effective countermortar fire is to be delivered.

T/Os & T/Es for FA as of 25 Oct 44

Higher Headquarters Batteries:

6-10-1	27 Sep 44—Inf Div
6-12	20 Oct 44—Group
6-20-1	20 Oct 44—Brig
6-50-1	20 Oct 44—Corps Arty
6-110-1	30 Sep 44—Cav Div
6-150-1	1 Apr 42—Mt Div
6-160-1	12 Feb 44—Armd Div
6-200-1	1 Aug 44—AB Div

Battalion Headquarters Batteries:

6-26	27 Sep 44—105-mm How
6-36	27 Sep 44—Medium
6-46	30 Sep 44—H-Dr
6-56	20 Oct 44—Hv
6-76	9 Mar 44—Obsn
*6-156	4 May 43—Pk
6-166	15 Sep 43—Armd
*6-176	28 Jul 43—Pk Trk-Dr
*6-216	1 Aug 44—Prcht
*6-226	1 Aug 44—Gli

*Combined Hqs & Hqs & Sv Btry

Batteries:

6-27	27 Sep 44—105-mm How, Trk-Dr
6-37	15 Jul 43—155-mm How, 4.5-in G, Trk-Dr (Med Arty)
6-47	1 Apr 42—75-mm G, H-Dr
6-57	20 Oct 44—155-mm G, Trk-Dr (Hv Arty)
6-67	20 Oct 44 8-in How, Trk-Dr (Hv Arty)
6-77	9 Mar 44—Obsn Btry
6-97	18 Aug 43—240-mm How, Trk-Dr (Hv Arty)
6-117	30 Sep 44—75-mm Fld-How, H
6-127	29 Sep 43—155-mm G, SP
6-157	4 May 43—75-mm How, Pk
6-167	15 Sep 43—Armd
6-177	28 Jul 43—75-mm How, Pk, Trk-Dr
6-217	1 Aug 44—75-mm How, Prcht
6-218	1 Aug 44—AA and AT Btry, Prcht
6-227	1 Aug 44—75-mm How, Gli
6-327	20 Oct 44—105-mm How, Trac-Dr
6-337	27 Sep 44—155-mm How, 4.5-in G, Trac-Dr (Med Arty)
6-357	31 Jul 43—155-mm G, Trac-Dr (Hv Arty)
6-367	2 Jul 43—8-in How, Trac-Dr (Hv Arty)
6-397	18 Aug 43—240-mm How, 8-in G, Trac-Dr (Hv Arty)

Service Batteries:

6-29	27 Sep 44—105-mm How, Trk-Dr
6-39	15 Jul 43—Med Arty, Trk-Dr
6-49	30 Sep 44—H-Dr
6-59	20 Oct 44—Hv Arty, Trk-Dr
6-129	29 Sep 43—155-mm G, SP
6-169	15 Sep 43—Armd
6-329	20 Oct 44—105-mm How, Trac-Dr
6-339	27 Sep 44—Med Arty, Trac-Dr
6-359	2 Jul 43—Hv Arty, Trac-Dr

Medical Detachments:

6-10	27 Sep 44—Hq, Inf Div Arty
6-12	20 Oct 44—Group
*6-25	27 Sep 44—105-mm How, Trk-Dr
*6-35	15 Jul 43—Med Arty, Trk-Dr
6-45	1 Apr 42—H-Dr
*6-55	20 Oct 44—155-mm G, Trk-Dr
*6-65	20 Oct 44—8-in How, Trk-Dr
6-75	9 Mar 44—Obsn Bn
*6-95	18 Aug 43—240-mm How, Trk-Dr
6-110	30 Sep 44—Hq, Cav Div Arty
6-115	30 Sep 44—H Arty
*6-125	29 Sep 43—155-mm G, SP
6-150	1 Apr 42—Hq, Mt Div Arty
6-155	4 May 43—Pk Arty
6-160	12 Feb 44—Hq, Armd Div Arty
6-165	15 Sep 43—Armd Arty
6-175	28 Jul 43—Pk-Trk-Dr
6-200	1 Aug 44—Hq, AB Div Arty
6-215	1 Aug 44—Prcht
6-225	1 Aug 44—Gli
*6-325	20 Oct 44—105-mm How, Trac-Dr
*6-335	27 Sep 44—Med Arty, Trac-Dr
*6-355	31 Jul 43—155-mm G, Trac-Dr
*6-365	2 Jul 43—8-in How, Trac-Dr
*6-395	18 Aug 43—240-mm How, 8-in G, Trac-Dr

*Common T/O and E

GERMAN GRID SYSTEM

By Lt. Samuel J. Tobin, FA

The Germans have mapped the greater part of Europe, and in addition have copied maps of other countries and converted them to their own use. German cartography is extremely painstaking and accurately detailed. Basically, the principles of the German grid are similar to the U. S. system. Main differences are the use of the metric system and different methods of determining declination, relief, etc. Knowledge of the system will be of value to personnel having access to captured documents, situation maps, overlays, etc., in regard to interpretation, declination, and orientation with their own maps.

TYPES OF MAPS

Principal military maps used by the *Wehrmacht* are the (1) *Deutscher Motorfahrer* series, 1:300,000, size 2º × 1º, strategic road maps covering most of Europe; (2) *Reichskarte* series, 1:100,000, size 30′ × 15′, hachured federal maps covering greater Germany; (3) *Kartenblatt* series, 1:50,000, size 30′ × 15′, contoured maps of the Reich; (4) *Messtischblatt* series, 1:25,000, size 10′ × 6′, contoured maps covering most of Germany.

Other types used are 1:1,000,000 strategic (size 6º × 4º) and 1:10,000 tactical maps. The Germans also use many French maps which have been converted to their military use.

Marginal information on German maps of tactical scale usually includes the dates of survey, publication, and revision; the name of the publishing agency, and the index of the political boundaries within the map, province, district, etc.; the name and numbers of the sheet; names and numbers of adjacent sheets, found in the borders of the map; the representative fraction; graphic scales in meters, kilometers, and a stride (*Schritt*) scale (80 centimeters, or approximately 32 inches—about one U. S. pace); the grid interval in centimeters; the geographic coordinates of the corners of the sheet; a coordinate square of appropriate scale for the map; an isogonic diagram plus the date of the diagram, information for the annual magnetic change; a conversion table for degrees to mils; a mark point and scale for orienting the map; and a legend of the conventional signs and symbols used on the map.

SCALE

The representative fraction is usually 1:25,000, 1:50,000, or 1:100,000. An accurate index to ground distance is offered by metric measurement on maps of these scales: 10 millimeters = 1 centimeter; 100 centimeters = 1,000 millimeters = 1 meter; 1,000 meters = 100,000 centimeters = 1,000,000 millimeters = 1 kilometer. Thus: on map RF 1:100,000, 1 cm MD = 1 km GD; RF 1:50,000, 1 cm MD = ½ km GD ∴ 2 cm MD = 1 km GD; RF 1:25,000, 1 cm MD = ¼ cm GD ∴ 4 cm MD = 1 km GD.

COORDINATES

Modern German maps use the same geographic degree system as the U. S.: latitude is measured north and south from the equator and longitude east and west from the Greenwich meridian. One degree equals 60 minutes, and one minute equals 60 seconds. Segments of one-minute interval are found around the borders of many maps to facilitate the reading of geographic coordinates.

On some older maps the prime meridian is taken from Ferro, the westernmost point or part of the Canary Islands. Ferro is 17º 40′ west of Greenwich. In the event that any maps happen to use Berlin as the longitudinal origin, the German capitol is 13º 21′ 51″ east of Greenwich.

Coordinates are read right and up as in our own system, the main difference being the use of a comma instead of a decimal in writing the coordinate reference. On maps containing parts of two adjacent zones, the incidence may be determined from the designation of the critical grid lines. See Fig. 3.

The Military Grid System (*Gaus Gitternetz*) of Germany consists of seven grid zones, each 3º wide, numbered consecutively 2 to 8, with no overlap as in the U. S. system (see Fig. 1). Grid interval is either 1 km or in multiples of 5 km. The central meridians of these zones are respectively, 6º,

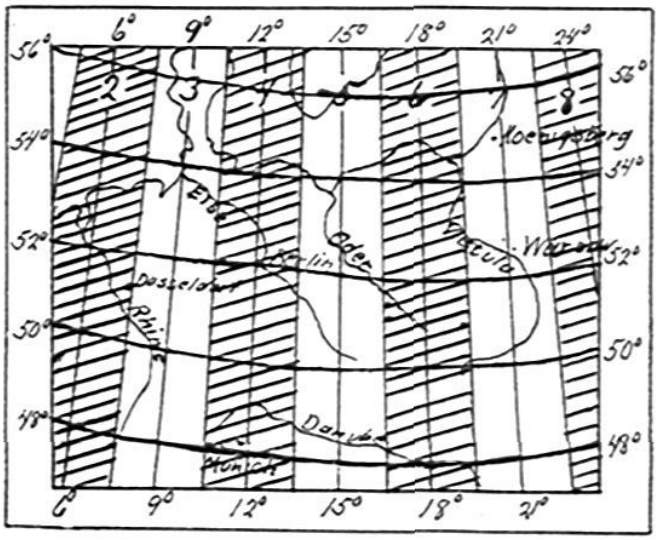


Figure 1. Zones

9º, 12º, 15º, 18º, 21º, and 24º east of Greenwich.

The designation of the central meridian (mark gridline) of each zone is arbitrarily given the value of 500,000 meters

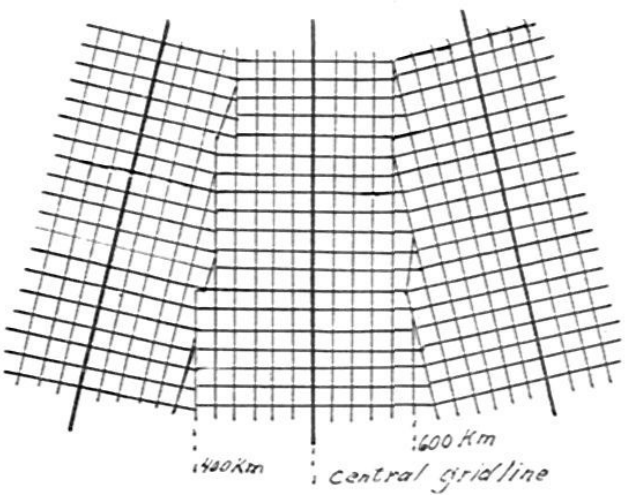


Figure 2. Grid Coverage

(Fig. 2). Each zone is approximately 200 kilometers in width. Thus the grid designations on the eastern edge of a zone are approximately 600,000 meters and on the western edge about 400,000 meters.

At critical intervals the vertical gridlines are designated by four figures. The first figure is the number of the grid zone; the next three are the grid reference to the nearest kilometer (Fig. 3). Maps on the edges of the zones will contain parts of two adjacent zones, with the respective grids designated as such (Fig. 3). On the borders of the map tick marks are found as a means of designating where the regular grid intervals would be if projected into the adjacent zone. This would be necessary if the map were to be used as a firing chart, necessitating the extension of a true grid from one zone throughout the map (see Fig. 4). With this non-overlapping system the actual map distortion on maps of 1:25,000 scale is only 3.2 meters GD or .13 millimeters MD, and on maps of scale 1:100,000 29 meters GD or .3 millimeters MD.

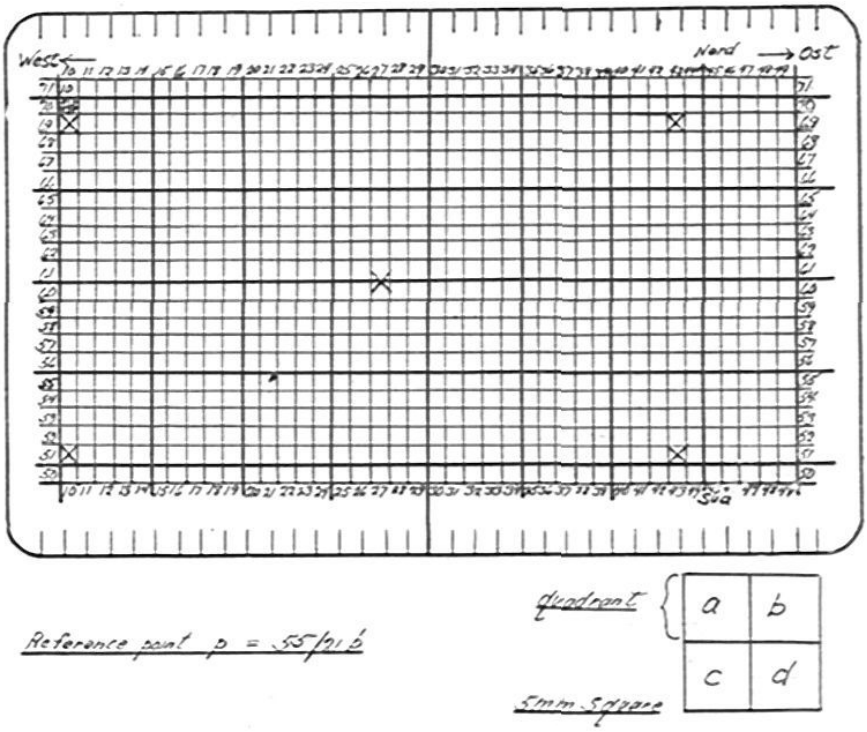


Figure 5. Map Template

The German map template (*Zielgevierttafel*) made of transparent celluloid, is divided into channels 5 - mm square, numbered 10 to 49 horizontally and from 50 to 71 vertically. Each 5-mm square (*Zielgeviert*) is subdivided by inspection into quadrants lettered a, b, c, d (Fig. 5). There are five x's or reference points on the template, one in each corner and one in the center. These reference points (*Festpunkt*) are known as reference points NW, SW, NE, and SE, or upper right, lower right, upper left, and lower left.

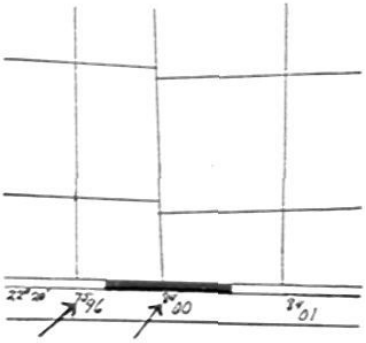


Figure 3. Map Overlap

To designate a point, place a specified template point over a specified map point and orient the edges of the template with the borders of the map; Then read the coordinates of the desired position up and right. A typical coordinate (point p, Fig. 5) would be expressed as 55/21b.[1] This method approximates the use of our M1 or M2 template.

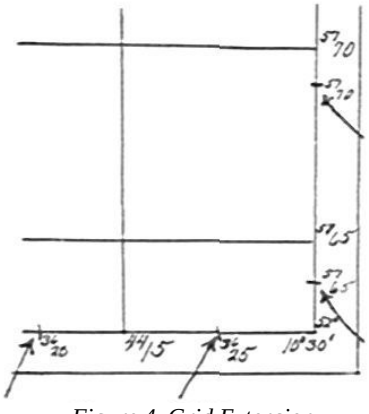


Figure 4. Grid Extension

The German thrustline (*stooslinie*) system consists of a line drawn through a point of origin, in a specified direction or to a designated point. The point of origin is given an arbitrary value in cm.

To use the system, draw a line at right angles from the thrustline to the point in question. Then measure along the thrustline in cm from the point of origin to the perpendicular. If the perpendicular is in advance of the point of origin, add

[1]In using the map template, the book *Deutsche Schutzen Kompanic* states that coordinates are read up and right. This differs from our normal procedure. Note that either method would give the same designation if the proper letter of the quadrant were given. Military grid coordinates are read right and up, whereas the method used for the template is up and then right.

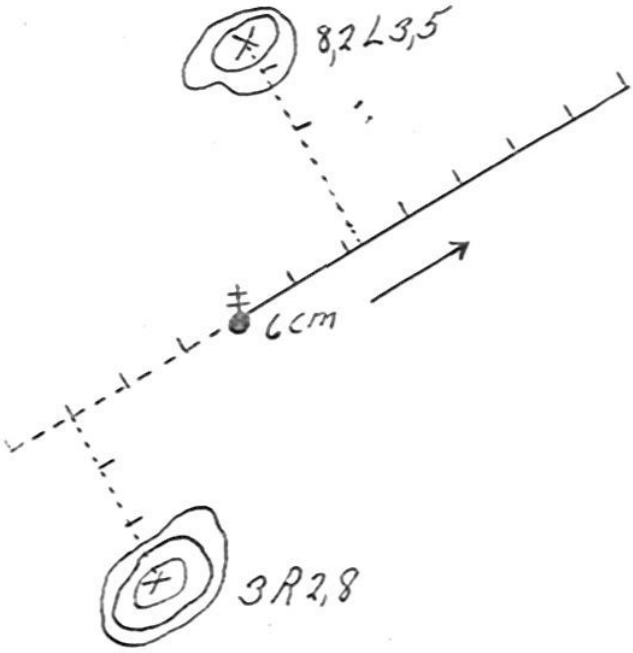


Figure 6. Thrustline

the distance in cm to the arbitrary value of the reference point. If the perpendicular is in rear of the reference point, subtract the distance in cm from the value of the point of origin. Then measure the distance along the perpendicular in cm to the point in question. Always face in the direction of advance and turn right or left at the perpendicular (see Fig. 6). German words for "right" and "left" are *rechts* and *links*. Thrustline coordinates are written as follows: 8,2L3,5 or 3R2,8.

On many maps a coordinate square (*Planseiger*) is printed to scale in the margin for the grid system on the map.

AZIMUTH

Most German maps' borders are coincident with true north. For this reason, declination information is usually given from Grid North.

Isogonic Diagram (Nadelabweichung)

Grid magnetic information is interpreted from an isogonic diagram found in the margin of the map (Fig. 7). To use the diagram, interpolate between the isogonic lines (on the diagram) at the coordinates of the desired position. Then, taking the annual magnetic increase or decrease, figure the proper declination for the present time, taking into consideration the date of the isogonic diagram.

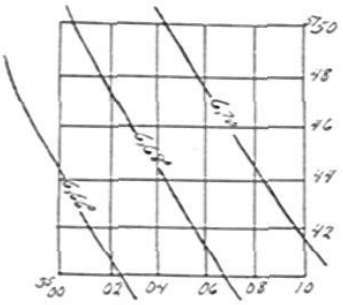


Figure 7. Isogonic Diagram

Conversion Table

The mil system is used by small infantry units as well as artillery units. Declination information is given in degrees and decimal parts of degrees in the isogonic diagram; a conversion table for degrees and mils is usually found in the margin of the map (Fig. 8).

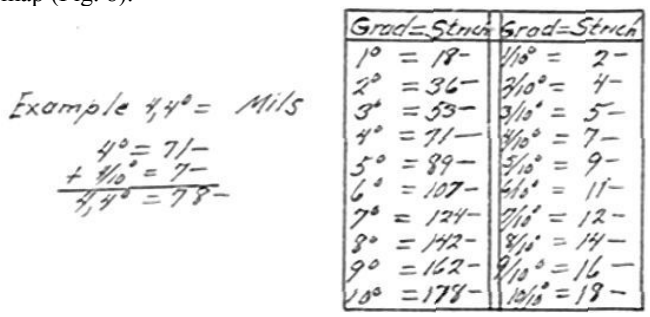


Figure 8. Conversion Table

Compass (Marschkompass)

All types of units use the German march compass for tactical maneuvers. Two luminous marks are found in the face of the compass, one on each side of the North letter. They are used to set off an approximate declination for the different sections, west and east, of Germany proper. The compass is graduated counterclockwise in mils. Thus, the values of the cardinal distances are N 6400, S 3200, E 4800, and W 1600 mils. A conventional type degree compass is also used, but the mil compass is most frequently encountered.

Orienting Point (Marschkompass Punkt)

German maps may be oriented by the use of a point (*M Punkt*) on the top of the map and a degree scale on the bottom. To orient

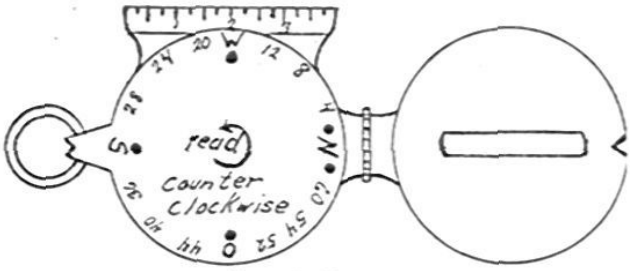


Figure 9. Compass

the map, determine the declination of the desired point from the isogonic diagram. Then draw a line from the *M* point to the appropriate declination number on the scale on the bottom of the map. A plus sign represents an east (and a minus sign a west) declination (Fig. 10). To orient, place a compass on the map and adjust until the north-south compass line, magnetic needle, and the declination line drawn on the map are all in coincidence.

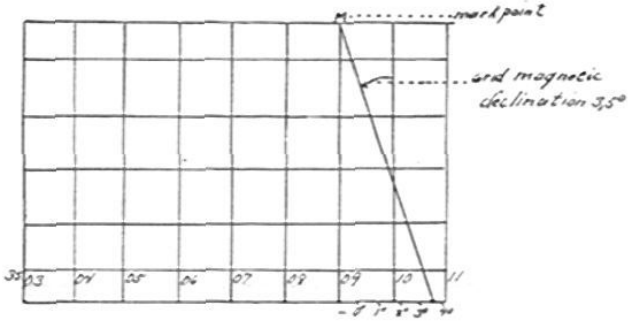


Figure 10. Map Orienting Diagram

TOPOGRAPHY

Relief is shown by means of contours, form lines, hachures, colors, shading, trigonometric points, and spot heights. Nearly all German tactical maps are contoured, while most strategic maps are hachured. Short hachures close together indicate

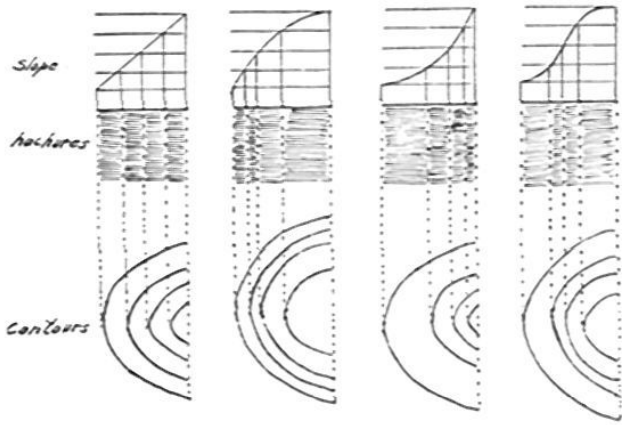


Figure 11. Hachures

steep slope, while long thin hachures indicate gentle slope (Fig. 11). On many maps, tiny arrows are used to indicate direction of slope and flow of water.

SIGNS AND SYMBOLS

German conventional signs and symbols conform generally to those of other nations, inasmuch as all are ideographic pictures of the objects they are intended to portray. Examples of German military symbols, abbreviations, and terms may be found in FM 30-22, or the MID book of German Military Symbols.

THE CAVES OF ANZIO

By Maj. Edward A. Raymond, FA

The following points in regard to liaison sections deserve emphasis:

(1) The liaison officer acts as coordinator of artillery observation in his sector—both by FA forward observers and by observers of other arms.

(2) The liaison party is larger in combat than on maneuvers.

(3) All members of liaison and forward observer parties should know all duties.

(4) Liaison and forward observer assignments properly belong to superior personnel.

(5) Forward observation and liaison personnel do not draw combat pay or wear combat badges.

—Artillery Officer (US), AFHQ

Some of the severest fighting of this war marked the German counterattacks of February 16-22, 1944, directed down the famous North Road toward Anzio and the sea. American Corps Headquarters had warned its formations ahead of time of two concentrations of enemy armor—one north of the "Factory," another in the vicinity of Ardea—but was powerless to forestall the blow. When it came, it came hard, and though storms of artillery fire swept the enemy's formations they drove back the exhausted American infantry and isolated the 2nd Battalion, IFSth Infantry. With it they cut off a field artillery liaison party. The sandstone ridge held by the infantry was tunneled by man-made caves, and in these the surviving doughboys and the liaison party held out for six days and finally fought their way back.

On Feb. 14th the ISFth Infantry was told to prepare to move its positions to the right as far as the North Road; a British division would take over their old positions on the left. This meant that the 2nd Bn, ISFth Inf, would relieve a British Guards battalion, a company of British infantry, and an American parachute battalion. On February 15th Capt. G. O. Hubbert, Artillery Liaison Officer to the 2nd Bn, made a preliminary reconnaissance of the new area with the infantry battalion commander; he established the static observation post for his artillery battalion and made tentative selections of two forward OPs. He met the forward observers (1st Lt. T. W. Carmichael and 2nd Lt. G. T. Robinson) in the evening, and arranged their contacts with the infantry companies. The infantry battalion's CP was established that night in the caves (852-314), which were tunneled into the reverse slope of a pronounced ridge; they were interconnecting and had six entrances.

At 0100 hours on the 16th a small attack came down the North Road. Our infantry had not yet taken over and our artillery was displacing; the British stopped the attack. At daylight the Americans took over. The British continued to hold the south bank of the river to the west, and the American line ran straight east from RJ 864319. Co E was astride the North Road, 1,000 yards north and east of the caves. G held a line on top of the caves and slightly uphill. F, in reserve, had an excellent rear-slope position on a ridge across the ravine and 500 yards to the south. Our registration was postponed until noon because the forward observers were too busy firing concentrations to attend to it.

Lt. Carmichael was in "Ration Farm," a group of houses in a hollow square at 861311. This was the only position in the area of Company E from which he could observe both sides of the North Road. Lt. Robinson, the observer with Company G, was in the westernmost of three houses at 854309. A coordinated German attack commenced at 0635 hours, and Lt. Carmichael immediately sent down a mission. The artillery delivered continuous fire from 0638 hours to 0730 hours. German tanks were thrusting down the North Road while enemy infantry infiltrated against Company G from the northwest and against Ration Farm from the northeast. The Luftwaffe supported this action with bombing and strafing missions, and by driving artillery observation planes to the ground.

Direct fire from tanks and small arms fire drove Lt. Carmichael out of Ration Farm. He was driven from place to place all day until he finally occupied the center house of the group of three, next door to Lt. Robinson. During the day Lt. Robinson had seen six of our infantrymen captured near his OP, had retired to a ravine, seen the German captors captured in their turn, and gone back to the house and stayed there under heavy small arms fire.

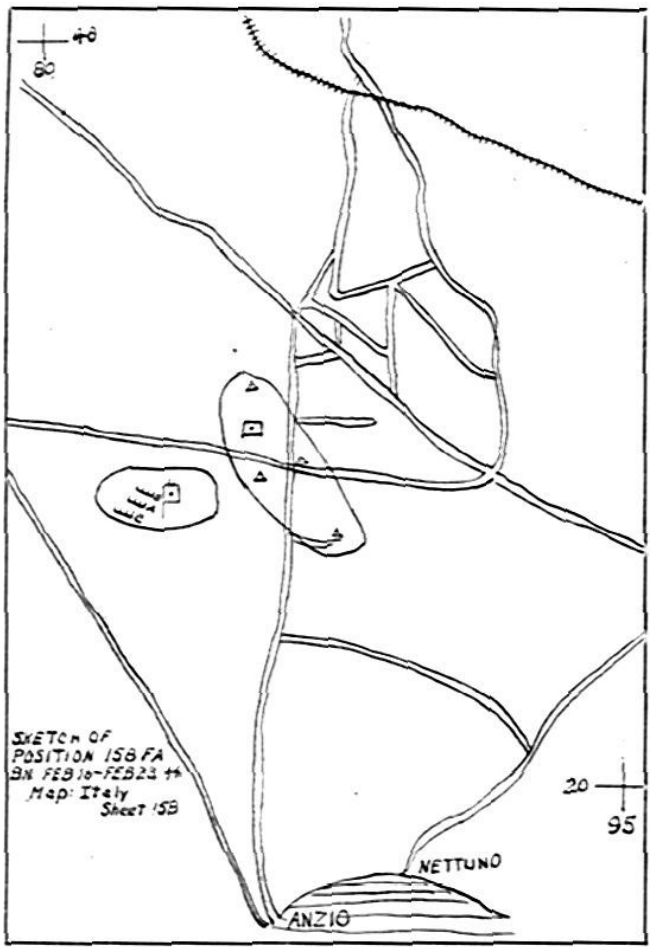
The direct support artillery battalion, the medium battalion in general support, and a British field regiment supporting elements on the left were all in precarious positions less than 3,000 yards behind the line, with one road running across a neighboring sector as the only way out. Nevertheless, orders were received that afternoon to establish a stock pile of 2,500 rounds at each battery position; the order defined the Beachhead Line and constituted it the final defensive line.

Feb. 17th began as a continuation of the 16th. The Germans threw some 80 tanks into their initial assault, including 20 Mark VIs. The infantry came down on a 5,000-yard front, with the brunt of the attack on the North Road. E Co lost contact on its right soon after daybreak, and remnants of the company closed in toward the caves. A continuous curtain of artillery fire covered this move, and afterwards permitted the doughboys to dig the new positions which they were to hold for the next five days.

By this time the infantry AT weapons had all been knocked out, and the 2nd Bn relied upon British 17-pdrs on their left and 3″ M-10s on their right for antitank protection. From time to time hits on the German tanks could be distinguished above the noise of battle. AP shell hits armor like a sharp blow on a church bell. An explosion usually follows.

Along the whole front of the attack the enemy came in dense waves, singing and heiling Hitler and acting generally as though they were doped up—but using plenty of fire power. A company engaged our G Company positions from the northwest, and were stopped. A company formed up around the Ration Farm and started working down the ravine toward the mouth of the caves. Aided by the forward observers and two infantry officers, Capt. Hubbert adjusted fire so as to sweep the ravine, and held the enemy back.

In spite of the constant fire of our artillery the enemy pressed his attacks during the remainder of the day and managed to infiltrate tanks behind the 2nd Bn. Three tanks drove up and started to fire at the row of houses from which Lts. Carmichael and Robinson were observing. Lt. Robinson adjusted on the tanks. Three rounds in quick succession from the tanks blew out the side of the room from which he was



observing, showering him with stone and plaster. He retired to the adjoining room and kept on sensing through the door and the breach in the wall. He completed his mission by forcing the tanks to withdraw. During the night he joined forces with Lt. Carmichael in the center house, where both parties remained until the close of the action. During the night Lt. Carmichael received shell fragments in his leg.

That night the mouth of the caves was attacked by a force estimated at about 100 Germans. They moved down from the North Road in a point-blank assault. A runner from Company E beat them in by 100 yards and gave the garrison a few seconds' warning. The infantry cut loose with rifles and machine guns and with rifle- and hand-grenades. Capt. Hubbert brought fire down on top of himself and kept it going for an hour. He mixed WP smoke with the HE he was using for the momentary illumination it afforded, and to make a white backdrop against which the advancing Germans could be seen. Although Jerry machine guns were delivering enfilading cross fire and Jerry infantry was throwing "potato mashers" from the hill above, the attack was finally beaten off. The closest any German came was ten feet up the hill from the mouth of the cave. Reconnaissance patrols later counted 18 dead near the cave, and from the moans heard up the ravine estimated that the Germans lost the greater portion of their hundred men.

Capt. Hubbert's Silver Star citation for the foregoing action states, "The fight climaxed in a small arms and grenade fight at the entrance to the cavern. Capt. Hubbert remained at his post within 20 feet of the mouth of the cavern and directed the fire of his own and reinforcing artillery battalions on the attacking force, at times placing fire on the mouth of the cavern. His devotion to duty during this period contributed greatly to the frustration of the enemy attack and resulted in the death of large numbers of enemy troops."

Feb. 18th was another busy day: the men of the 2nd Bn repulsed local attacks from every direction of the compass, and withstood the direct fire of tanks that worked their way into the areas behind them. F Company had ceased to play a reserve role within two hours of reaching its "reserve" position. It was especially active and succeeded in taking a considerable number of prisoners. It had been difficult from the first to maintain contact with the British on the left and from this day it became impossible. They had too few men, but they wired themselves in and hung on, day after day, until the Guards relieved them. Liaison officer and observers were depending on radio communication; the constant shelling night and day took wire lines out ten minutes after they were laid. The division artillery abandoned its lines to battalions on this day.

Capt. Hubbert, in the cavern, was trying to keep his artillery posted on the situation and to coordinate artillery fire. Most of the time he worked 24 hours a day. He called for unobserved concentrations, but did not shoot, himself, while he had observers. He relayed commands from infantry spotters whom he knew were reliable. Capt. Sparks of E Company was a particularly good shot; he was not afraid to bring fire in close to his own position, and killed a lot of Krauts. There was a quarter of a mile of wire through the tunnels and up to the E CP.

The caves had been dug during the other war. The 35-40 "Pizons" (*Paesano*—countryman, friend) who had taken refuge with the soldiers in the caves were unable to tell why the caves had been constructed, but there used to be a powder factory at Anzio. The ceilings were 15-25 feet high, and vaulted. The air was cool and circulated well. Sanitation was not difficult. The walls were of sandstone, which was probably moist and soft originally but had hardened from exposure to air. Now the walls resisted the heaviest shelling with only some crumbling in a few places. Falling rock was responsible for the death of just one man. Most of the runnels were 50-60 feet below the surface of the ground. The Americans found sand and rock revetments already built at the entrances by the British. For ease of defense five of the six entrances to the caves were heavily walled up, and the tunnels inside were also barricaded. The Germans had the range to the used entrance with their mortars, and permitted those inside no sleep. The beleaguered troops came out only at night to get supplies, evacuate wounded, post reliefs, and go down to a creek in the ravine for water. Litter patients were carried 1,000 yards back to trucks on two nights, and in all some 50-60 walking wounded got out after dark. Water was brought up from the creek nightly until next to the last night, when the water detail went out and did not come back.

The southbound enemy gave the defenders no peace on the 19th. As on previous days, they continued their infiltrating tactics on the left and rear of the 2nd Bn. As before, their advance was retarded and their formations were broken up by artillery concentrations. These were adjusted and fired continuously until the Germans gave it up and retired. There were many German casualties.

Shortly after noon the enemy marched a column of some 200 men down the North Road in close formation. The astonished Americans captured them, lock, stock, and barrel. Upon

interrogation they said they had been told that the Allied foot troops had retreated to the beach, leaving only a few pieces of artillery to cover the embarkation. They were merely marching down to occupy the beachhead. Identification of prisoners captured during the day brought the number of enemy divisions on the Anzio front up to six, a ratio of 2-1.

During the night Lt. Carmichael was evacuated to the caves and from there to the rear. In three days he had fired over 40 missions, on such targets as few observers see in the course of a whole war. Since it had been impossible to move him during the day his badly wounded leg suffered from enforced neglect, and had to be amputated. Cpl. W. L. Willsey took over at the OP.

The Luftwaffe ushered in Feb. 20th with an air raid that lasted 30 minutes. Antipersonnel and fragmentation bombs came close to some of the American batteries. Enemy vehicles started coming down the North Road. Small groups of enemy formed up and exposed themselves, as though deliberately, at points which were now familiar and well shot-in. Our batteries, which had previously received a few rounds—mostly high bursts, without any ill effects—rose to the tempting bait and were answered by sizable concentrations of 88- and 105-mm fire.

Later in the day neighboring units on the right received an attack following an artillery preparation of an hour.

Plans were drawn up for effecting the relief of the 2nd Bn around the caves.

The enemy gave less trouble, but therefore fewer targets, during the daylight hours of Feb. 21st, but became active at about 1745 hours. Another attack on the caves began. This time it was made by two forces; one approached from the northwest down a draw toward Company G, while the other approached from the northeast down the ravine from the Ration Farm. Again continuous fire was laid on by Capt. Hubbert, Lt. Robinson, and infantry observers. The ravine was swept from the Ration Farm to the cave mouth itself. The enemy retired about 2000 hours, having suffered many casualties. Soon after "Cease Firing" had been given enemy bombers came in and attacked our artillery; they scored some near misses, but caused no damage.

Relief of the 2nd Bn was expected to take place on the night of Feb. 21-22. A British Guards battalion fought its way up to the position, but in so doing used most of its individual ammunition and lost its ammunition train. In such straits and with the chance of resupply so uncertain it was unthinkable to leave, so the 2nd Bn stayed another 24 hours.

Lt. Robinson, anxious to learn the details of the scheduled relief, eluded the watch of the enemy that surrounded his post after dark and made his way to the CP of Company F in order to talk to Capt. Hubbert by phone. He returned to the two parties at the OP with news that everyone would be relieved the following night, but in entering the house he aroused one of the Germans standing by the wall. The soldier tossed a grenade into the window after him. This started a grenade and small arms fight which lasted until dawn. At daylight the enemy returned to cover and contented themselves with firing furiously at the house.

In order to observe and conduct fire it was necessary for the tiny garrison to cover one of their party with rifles. While firing a mission at 0300 hours on Feb. 22nd, Lt. Robinson was shot through the head by an enemy sniper and killed instantly. He had fired 61 missions in 5 days, bringing in on some of them as many as 5 battalions in fire for effect. Until his death, at the eleventh hour, he had borne a charmed life, and had been an unfailing inspiration to his men. Sgt. L. K. Shoemaker, of Lt. Robinson's party, took over, and later succeeded in driving the Germans further from the house with a well-adjusted concentration.

Before dawn on Feb. 23d the remnants of the 2nd Bn left the caves and began their march back for safety and rest. By then evacuation of the seriously wounded was recognized as an impossibility. The medical officer stayed in the caves with 18 litter cases. The walking wounded were given the opportunity to remain behind, but all volunteered to come out. Pvt. Carter, the liaison party driver, was left behind with a detail of drivers and property guards to bring his vehicle out later when the British had secured a road.

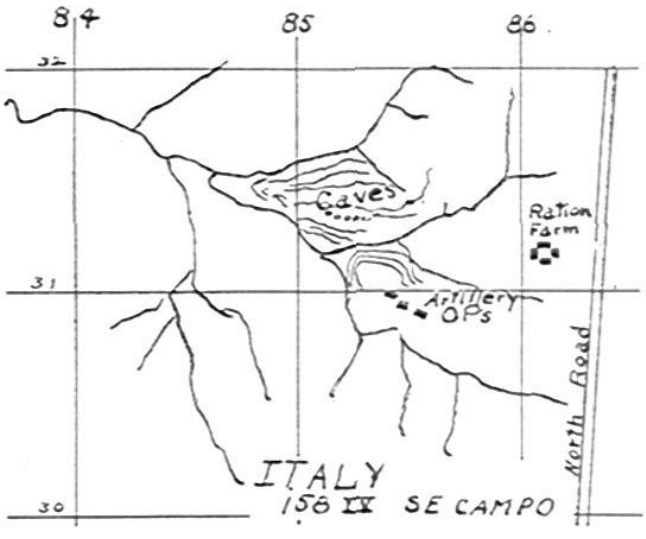
Earlier that night attempts had been made to get 5 wounded out of the artillery OP in the house, but the enemy machine gun and rifle fire was too hot. Company C made the attempt, with both the machine guns and the 60-mm mortar it had left. Shortly before midnight, regiment ordered battalion to desist.

The battalion moved out of the caves at 0130 hours (less Company F and attachments, which joined as the main party passed their positions). The column formed in single-file, in the order G, F, Headquarters (with the Artillery Liaison Section), Heavy Weapons, E, and finally the walking wounded. The line was distressingly short.

In the pitch-blackness the Germans must have thought that the large body of men were their own troops, as an advance of nearly 1,000 yards was made before mass enemy machine gun and mortar fire was encountered.

From this point the column stopped walking, took to the ditches, and started to crawl. Somewhere along the column a man fell out and snapped the line. Those behind were halted for 45 minutes. Doubling the column, Capt. Hubbert and his liaison sergeant found the man responsible—asleep. The line started moving again, and then dawn commenced. Headquarters Company fanned out into the wadis and worked their way in to the main positions. Heavy Weapons, just behind it, was swallowed up and lost. Of E Company the company commander and about 5 men got through. It was hard for the walking wounded to crawl, and with the coming of daylight they were all killed or captured.

The British infantry occupying the main positions were waiting to pass the Americans through. Two large British tanks had been brought up into dangerously exposed positions in the front lines, and fired on Jerry machine guns. When it



grew light, 25-pdrs laid down an excellent 2,000-yard smoke screen, using time-fuzed BE smoke shell.

Exposure to constant wet and cold had taken a severe toll, particularly of those who had been outside the caves. Cases of trench foot were numerous. The men were stunned by the noise and lack of sleep they had endured so long. Few were entirely unwounded. They felt themselves lucky, though. Of 35 officers and 780 men of the 2nd Bn who went into the cave positions on Feb. 16th, 15 officers and 162 men got back one week later.

The OP parties left in the houses maintained radio contact until 1030 hours. By that time they had run out of small arms ammunition and a German tank had worked up to within 100 yards of the house they were in. The Americans had had no sleep for five days and no water for 36 hours. The lack of water was particularly hard on the 5 wounded, three of whom were litter cases. Enlisted personnel from an F Company OP party, and an FO party of British gunners, were also in the house. After conferring by radio with the British infantry commander on what he ought to do, the British FOO (Forward Observation Officer)—a subaltern—spoke to the American artillery battalion commander. The American lieutenant colonel advised him to do what he thought best. There was no choice but to surrender. The able-bodied were evacuated to Rome. One of the Btry C party, Pvt. C. L. Shelton, returned to duty with our forces on March 6th.

At noon of the 23d the American infantry sent out vehicles under Red Cross flags to attempt to evacuate the litter cases from the caves. The detachment was under a medical officer, and a German medical corps man, our prisoner, was taken along too. A German tank officer, commanding several tanks in the area, allowed litter parties to go into the caves and bring out wounded—including two wounded Germans whom the defenders had taken in. The artillery liaison driver, Carter, and the American infantry personnel left in the caves also acted as litter bearers. When the patients had been placed in the vehicles the German tank officer captured the whole column, medical officer and all, and sent it to the rear under guard.

As an epilogue to the story, the subsequent experiences of Private Carter are given, just as he wrote them down for his battalion commander.

"To start my story, I was left with my jeep and equipment in the hope of being able to get it out the following night. This, however, became impossible. Upon finding it that way we planned trying to fight our way back through the lines and make contact with friendly troops. About 1400 hours nine of our medical detachment came through the lines to where we were, and so our plans were changed again. . . .

"The question has been asked of me, did the Germans try to get us out of the cave we were in? Yes, they tried three or four times to rush the entrance. Each time they were driven back; they only tried it once after the section I was with left. I myself had my rifle shot almost out of my hands. I received no wounds, however, and managed to hold on to my rifle and get the one that had shot at me. There were others that I got during the day; two were carrying A-Rations from what had been our OP.

"Everyone has asked what the Germans did when our medical detachment came through. No action was taken to stop them or anything and that made us think we could get the wounded out. They never tried to stop us until we reached a point where there were four Mark IV tanks. We had two wounded Jerries who had tried to get into the cave and a Jerry aid man who had given himself up, but they took us all prisoners anyway and we carried our wounded to one of their aid stations. What was done with them after that I do not know, as I was taken to their CP and was searched and questioned. We stayed there under our own artillery fire all night. Next morning we were marched back about 5 miles before we stopped again. Here we found more prisoners. We were searched again, but not questioned. In this place there were 6 self-propelled guns firing. I have found that on the map and given it to Capt. Hubbert. We walked farther back and while we were doing that we were fired off the road by some of our artillery and near there I saw 2 AA guns on trucks (which I also reported).

"From there on I never saw much stuff until I got on my way back. We walked until about 1430 hours on Feb. 24th. We got something to eat for the first time at about 1700 hours, and on Feb. 25th they had trucks to take us the rest of the trip, only after they had arrived our planes took care of them and we walked the rest of the way. Upon reaching the camp we were made to sign our names and were told to put our home address, plus the address of our outfit. This, of course, I did not do. He tried to get me to, and said that it would help the Red Cross let my folks know that I was a prisoner.

"After that we were bedded down like hogs, with just a little straw to sleep on. There I stayed for 4 days, leaving on the afternoon of Feb. 29th [manner of departure omitted]. . . ."

Upon the return of Pvt. Carter to our lines, Capt. Hubbert's liaison section was reunited; all six members had come out unscathed from the Caves of Anzio.

When this photo appeared on page 642 of this JOURNAL for September, 1944, the weapon was not identified. Captured from the Germans in Normandy, it proves to be a 155-mm gun, St. Chamond, model 1916; the Germans refer to it as the 15.5-cm K.420 (f). Its carriage sometimes mounts a 145-mm gun which the French used also as a naval piece; the Germans call it the 14.5-cm K.405 (f). Both versions belonged to the artillery reserve (comparable to our War Department Reserve Artillery).

The 155-mm gun is 38 calibers long and has a maximum range of around 22,000 yds. Its traveling weight is 13,090 kilograms—about 14½ tons.

For stability, the carriage is braced by two jacks when in firing position. These are emplaced by means of handwheels, one of which can be seen between the wheels of the carriage.

FOR FAST WATER HEATING

By Capt. Joseph L. Amell, Jr., FA

Among the contributions of U. S. troops on the Anzio beachhead was the development of a field water heater more efficient than commercial stoves for heating mess-kit water. This new heater, adopted and approved by other units which served in the same field artillery group on the beachhead and thus well tried and proved in combat, embodies many desirable features:

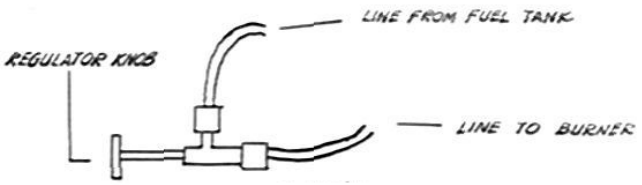
1. It is of simple construction.
2. Operation is easy.
3. Maintenance requires only a few minutes each day.
4. Time saved in maintenance and operation gives the mess sergeants several man-hours of additional help daily.
5. It is more efficient—mess-kit water can be brought to a boil six times as fast as with the commercial field heating units.
6. Use of only one GI field heating unit is required. The two additional units ordinarily used in heating mess-kit water may be used by the mess sergeant for cooking purposes, if necessary.
7. It is easily dismantled for movement.

This heater is built on the old "torch" principle. It is made entirely of salvaged material. Construction is of materials which may be obtained by various means by organizations while in the field. It could be manufactured commercially at low cost.

Materials required are: ½″ or ¾″ gas or water pipe of suitable length; gas pipe, copper, ¼″ (obtained from old field heating unit filter); connecting tube between gas or water pipe and copper pipe (also obtained from old filter); shields, made from C-ration cans with ends removed. No filter is used.

Pinholes are put in pipe at a distance determined by the size of the water cans to be heated. The end of the gas or water pipe is plugged or welded closed. There may be as many pinholes as desired.

A field heating unit supplies fuel and air pressure. Fuel may be the low-octane truck gasoline. Occasional use of "white" gasoline, if obtainable, will clean the torch.



Fuel valve

Operation is simple. Only the fuel valve on the field heating unit is used—flame and air valves are not used. To start the water-heater the fuel valve is turned one-quarter on, and the pinholes are lighted. When the heater is cold gasoline will collect in the pipe and burn off with yellow flame. After a few minutes the heater produces a steady, hot blue flame.

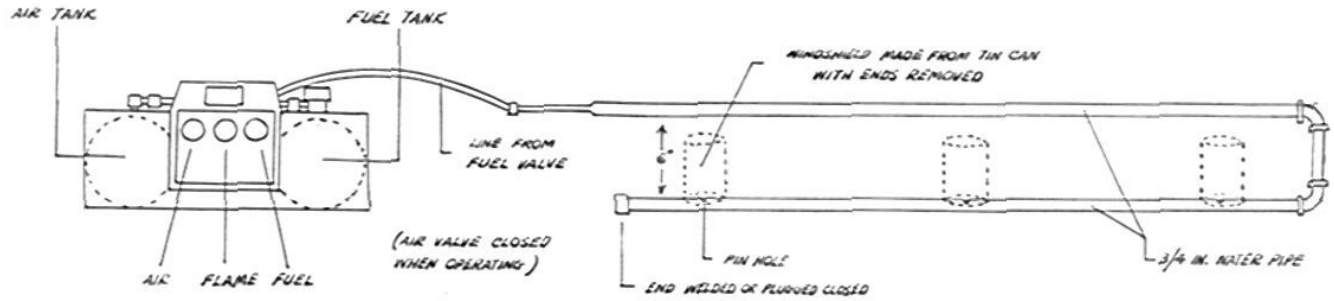
Mess-kit water, 15 gallons in each of three GI cans, can be heated in 20 minutes—as compared with the two hours required by the commercial unit. The amount of heat is variable, according to regulation of the fuel valve. Such a unit will consume one tank of fuel in 20 to 45 minutes, depending on whether the valve is opened or nearly closed.

The only maintenance consists of providing fuel and air. Should pinholes become clogged, they may be cleaned with a piece of bent wire while the heater is in operation.

Pressure in the air tank should be over 50 pounds.

Care should be taken in setting up the heater to place it on the level. Unless pockets for excess gasoline are attached beneath pinholes, the heater should not be placed on wooden flooring or operated in a tent or building. In any case, except when out-of-doors, fumes may be dangerous.

This heater, incidentally, is dear to kitchen men because its use does not require them to spend much time exposed in the open, performing maintenance and operation tasks. Absence from the open is often to be recommended!



FA AS AAA

Members of an American Field Artillery battery on the Anzio-Nettuno beachhead know what happens when a low-flying enemy bomber meets an artillery shell head-on. They saw the million-to-one chance materialize.

During the second attempt by the Germans to push the Allies from the beachhead into the sea, the battery, commanded by Lt. Roman W. Maire, was laying down a heavy barrage to stem a night attack. As the gun dropped their shells among the assaulting troops nearly two miles away, Nazi planes flew overhead, dropping flares to illuminate ground targets. The battery continued to fire. One of the bombers swooped low—so low that it blundered directly into the path of an enemy-bound shell.

The impressive box score of the battalion to which Lt. Maire's battery belongs already had included a German observation plane—brought down against odds perhaps higher than those which saw the enemy bomber destroyed by an artillery shell. Pvt. Robert T. Fitzmire saw the plane flying low overhead one day, raised his rifle, fired once—and sent it crashing to the ground.

Camouflage for Armored Artillery

By
T/5 Ralph Williams, FA

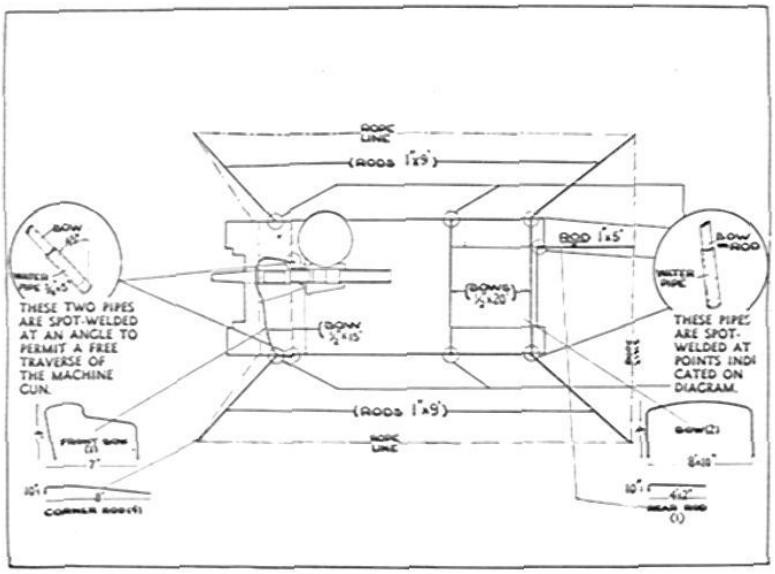
Figure 1. All camouflage equipment in place, except the net.

Because of its mobility, Armored Artillery is used to support many advance guard actions. As a result, firing positions are occupied in a hurry with prompt delivery of fire as the first thought. Cover and concealment are secondary if fire is to be delivered immediately. When the request for fire comes down over the executive's radio, he disperses his self-propelled 105-mm howitzers as much as is practicable, having each take what cover and concealment happens to be close at hand.

In a more deliberately occupied position, where the battery will possibly fire for days, concealment is essential. The M-7 SPM is extremely difficult to conceal from enemy observation, being 18 feet in length and about 9 feet high at some points.

Current T/Es allow each M-7 a 45′ × 45′ camouflage net. As yet, the engineers have not brought forth a suitable method or any suitable equipment to aid in breaking the outline of the M-7 when the camouflage net is draped over it. To the enemy, an M-7 with the net simply draped over it appears to be just that.

The armored firing battery with which I saw combat in Sicily used to very good advantage the arrangement pictured here. The battery was commanded by Capt. Robert Borten, whose first ideas were teamed with the improvisations of his M-7 drivers to produce this system.



The material needed should prove fairly easy to find. It includes:

4 corner rods, approximately 1″ × 9′
1 rear rod approximately 1″ × 5′
5 water pipes approximately 1¼″ × 10″
6 water pipes approximately ¾″ × 5″
1 75-foot rope approximately ½″ diam.
2 metal bows approximately ½″ × 20′
1 metal bow approximately ½″ × 15′
4 leather straps approximately 12″ long

Close scrutiny of the accompanying photos will give a general idea of use of the above material. The corner rods are linked perpendicularly for about 10″ on one end and socketed in the 10″ water pipes, which are spot-welded on each of the four corners of the M-7. They should then stretch outward, parallel to the ground and at a lateral angle of 45º from the side of the M-7, the two front rods pointing toward the front and the two rear ones toward the rear. The rear rod listed above is mounted in the same manner on either the right or the left side of the rear armor, just off the rear deck. Then the rope is used to give the camouflage net all-around support. It is tied on the outward tip of each of the five rods, the ends being fastened to the front grouser boxes of the M-7.

The metal bows support the center of the camouflage net. Five of the ¾″ × 5″ pipes are spot welded on the sides of the vehicle, the remaining one being affixed to a point on the armor to the left of the ring mount (looking forward). The three metal bows are socketed, parallel to each other, in these lengths of spot-welded water pipes. The front bow should lean forward so as to surely break the outline of the front of the vehicle. These bows should each be twisted enough to prevent uniformity.

The corner and rear rods can be folded to the vehicle and secured for marching. If the march is to be a short one the rope and rods can be folded in, leaving the top bows and the net up and tucking in the sides of the net. The front part of the net can be rolled in to the front bow and secured there.

In Fig. 1 the M-7 is shown with the supporting rods, bows, and rope installed. Close scrutiny will reveal the spot-welded pipes used for

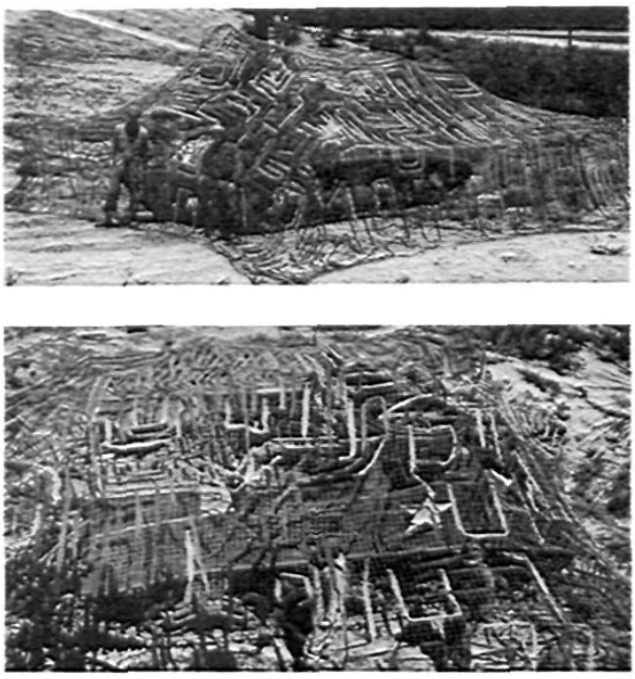


Figure 2. M-7 completely draped, using methods described here.

sockets for the rods and bows. Note the rear rod protruding from the rear end of the M-7.

Fig. 2 shows the M-7 completely draped with this equipment. Note that there is ample space under the net to dig foxholes and ammunition pits. Also, the net sufficiently clears the SPM to allow free mounting and dismounting of cannoneers. The mount may be moved short distances from these positions.

Fig. 3 shows the howitzer prepared for action. For this, simply roll the forward part of the net back to the front bow and secure it there. There is plenty of room for full traverse of the tube.

Figure 3. Prepared for action.

Figure 4. Draped for march order.

In Fig. 4 the mount is shown at march order. It can travel for long distances as shown here. Net and bows need not be removed. Note the clamps which secure the two corner rods to each other and to the side of the mount.

In Fig. 5 the mount is shown camouflaged as permitted by current T/Es. If the chief of section is not aided by natural concealment, the outline of the M-7 likely will not be completely broken.

The ring mount for the .50-cal. machine gun is completely covered by the camouflage net. One solution to this is to cut a hole the size of the ring and lace the net all around to reinforce it. Then stretch that part of the net around the ring mount so that the net is below the ring. This will give free movement of the skate mount.

From the air, if the camouflage net is of the correct color, it is extremely difficult to see an M-7 if this arrangement is used. It almost completely breaks the outline of the vehicle. The materials needed for this system should be easy to find at your salvage yards.

Figure 5. Draped with net only.

TRAINING FILMS RECENTLY RELEASED

1-3343—Malaria Discipline—35-mm
7-2051—The Soldier in Bivouac—35-mm
9-1358—Preparation of Material for Overseas Shipment, Part I—Cleaning, Preserving, Wrapping—16-mm and 35-mm
9-1359—Preparation of Materiel for Overseas Shipment—Part II—Packing and Boxing— 35-mm
9-1371—Internal Combustion Engine—Principles of Operation—35-mm
9-2058—Fundamentals of Artillery Weapons—Part I—Types and Components of Cannon— 16-mm and 35-mm
9-2059—Fundamentals of Artillery Weapons—Part II—Types and Components of Carriages—16-mm and 35-mm
11-2063—Theory of Simplex and Phantom Circuits—Part II—Unbalanced Conditions—16-mm
19-1360—Handling Prisoners of War—35-mm
21-1370—Camouflage—Movement of Individuals and Small Units—35-mm
21-2056—By Your Command—16-mm
30-1373—Recognition of the AFV's—Italian M 13/40 Medium Tank—16-mm

Not in the BOOK

EDITOR'S NOTE: ***This feature is devoted to ideas sent in by our readers describing methods or devices which, though not specified by official literature, have proved useful in service.***

BATTALION ONE ROUND—WITH ONE BATTERY

By combining high angle and low angle fire on a target, one howitzer can put 3 rounds on a target in 4 seconds. For a surprise fire mission, the initial fire can be 3 times the normal fire from the number of weapons actually available. It is so timed that the fire of all batteries falls on the target at the same time.

The battery has a prearranged data sheet giving the data for high angle and low angle fire on the target, *including the time of flight of each*. The high angle volley is fired, the first low angle volley fired so as to reach the target 2 seconds ahead of the high angle volley, and the second low angle volley fired as soon as possible. This puts three volleys on the target in about 4 seconds. For example, if the time of flight of the high angle volley is 46 seconds and for the low angle 13 seconds, the second volley is fired 31 seconds after the first.

Laying the piece in time for the second volley is a problem. Suggestions for speeding the process:

1. Lay each piece at the low angle settings, marking a chalk line on the traversing are under the pointer and also two matching chalk lines (one on the elevating are, the other on the elevating gear housing). Make a chalk mark parallel to the sight mount at any convenient place on the left side of the tube.
2. Lay the piece at the high angle settings.
3. *Without moving the tube*, put the low angle settings on the sight and range quadrant, moving the sight mount until approximately parallel to its chalk line.
4. As soon as the high angle volley is fired, move the tube rapidly to the new settings. Matching the chalk indices is an aid in bringing the piece to its proper elevation and deflecton, but the final check must be made by looking at the level bubbles. Depressing the tube a thousand mils rapidly is a tiring operation and No. 1 cannoneer is apt to slow down, so the chief of section or another man can stand by and relieve him when he shows signs of slowing. With practice, a crew can make the change in about 20 seconds.
5. The executive gives the command to fire at the proper second and the next round is fired as soon as possible.

It is possible to fire three volleys, each with a different charge, on a target simultaneously, but the ranges at which this can be done are somewhat limited.

Very careful coordination and timing are necessary in firing a battalion or several battalions on a target with this type of fire. The Time on Target (TOT) must be given due to the dispersion of the batteries and consequent differences in time of flight. For example, when all batteries have reported "Ready," S-3 announces "Time on Target, 60 seconds from —NOW," repeating the time count at 10-second intervals. Batteries are fired at "Time on Target" minus the Time of Flight as shown on the prearranged data sheet. If the time of flight is near 60 seconds, a longer warning time should be given.

LT. COL. ANDREW R. LOLLI, FA

RAPID RESTITUTION

The following is a rapid, simple and accurate method of restituting points from a photo to a firing chart. The only equipment necessary is a straightedge, a G.I. xylonite triangle, and plotting pins. No overlay paper is required.

Choose two points (A and B) on the photo, whose chart locations are plotted. Pick these two points so that they will give the best possible angle of intersection at the point to be restituted (500—2300 mils). Assuming that the photo is of a larger scale than the chart, the procedure is as follows:

1. Mark points A and B on the photo and draw a line connecting them, extending the line to the edge of the photo. Lines may be drawn on photo with a hard pencil or scratched on with a plotting pin.
2. Draw line A—B on the chart, prolonging it so that it will extend beyond the width of the photo.
3. Superimpose A on the photo over A on the chart (by sticking a pin through A on the photo into A on the chart), and place line A—B of the photo in coincidence with line A—B on the chart. Secure one edge of the photo to the chart while it is in this position. By inspection, prick through a point on line A—B on the photo directly over point B on the chart. Call this point B'.
4. Mark point C (to be restituted) on the photo and draw the line A—C.
5. Place the longest side of the xylonite triangle on the photo along the line B—C. Set a straightedge against either of the remaining sides of the triangle (see Fig. 1).
6. Holding the straightedge in place, slide the triangle along it toward A until the longest side comes to B' (chart location of B on photo—see Fig. 2). Prick through to the chart beneath the point formed by the intersection of the longest side of the triangle with the line A—C. This is the chart location of point C.

When the photo is of a smaller scale than the chart, the same procedure is followed except that in Step 4 the line A—C on the photo must be extended beyond C.

If the points A and B chosen on the photo (chart location known) will not give a good intersection with point C (to be restituted), it is necessary to first restitute an auxiliary point onto the chart and use it along with A or B as a base to locate C (see Fig. 3).

LT. WILLIAM J. WALSH, JR., FA

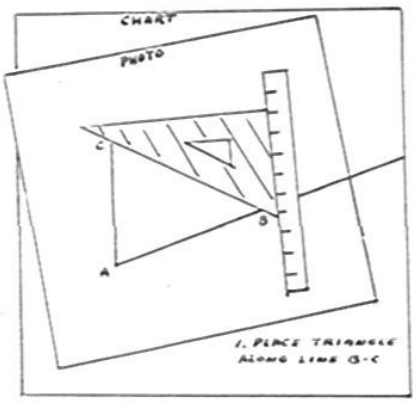


FIG.1

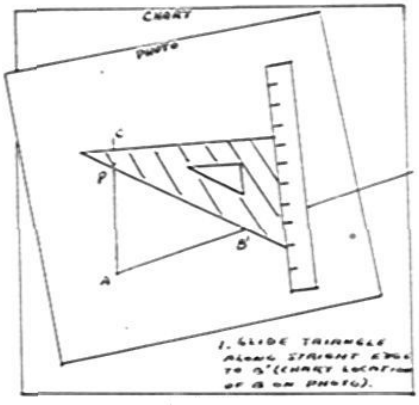


FIG.2

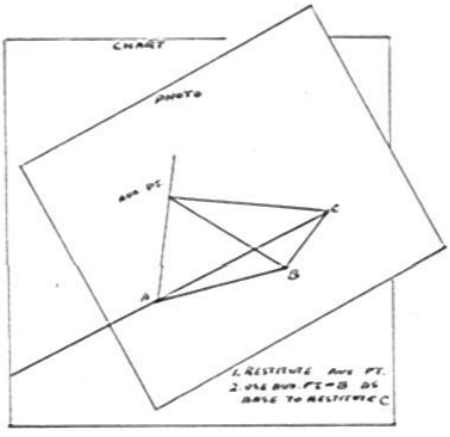


FIG.3

Diary of War Events

(As Reported by the American Press: Edited by B. H. W.)

OCTOBER, 1944

1st Canadian troops capture the port of Calais along the English Channel.
British 8th Army in Italy captures Savignano.
U.S. 14th Air Force in China destroys and abandons its advance base at Tanchuk.

2nd U.S. troops north of Aachen launch a surprise drive into Germany and gain 2 miles.
Allied planes bomb Cologne, Kassel, Hamm and Brunswick in Germany.

3rd U.S. 1st Army breaks Siegfried Line at Ueback.
Pacific fliers bomb Jap oil base at Balik Papan, on Borneo. Shoot down 7 planes; lose 3.

4th Allied fliers in the southwest Pacific bomb new targets in the Netherlands Indies. Sink 10 Jap ships.

5th British troops which landed on the Greek mainland Sep 26 advance through the northern part of the Peloponnesus and capture Patras, 3rd largest city in Greece.
Pacific fliers again bomb Balik Papan, Japs' oil center on Borneo. Destroy 19 planes, lose 7 bombers. U.S. losses on the Palau Islands total 1,022 killed. Dead Japs total 11,043.

6th 2,000 or more U.S. planes raid oil, aircraft and ordnance production centers in Berlin.
U.S. 5th Army in Italy captures Loiano, a communication center 14 miles below Bologna.

7th U.S. 1st Army smashes 2 miles through Westwall defenses north of Aachen.
5,500 Allied planes raid German military targets from Vienna to the Baltic. Destroy 49 planes. We lose 51 bombers and 15 fighters.

8th U.S. 1st Army in Germany surrounds Aachen and captures Crucifix Hill.
U.S. 3rd Army smashes forward on a 25-mile front and captures 7 towns between Pont-a-Mousson and Chateau-Salins.
British 8th Army in Italy crosses the Fiumicino River and captures Mount Farneto.
Pacific fliers shoot up the Wolfe Field and the Zamboanga seaplane base in the Philippines.

9th Anglo-Canadian troops make a surprise landing behind the German line in Belgium. Establish 2 beachheads between Leopold Canal and Schelde estuary.
Allied bombers raid military targets in the Schweinfurt, Coblenz, Mainz and Ruhr areas.
Southwest Pacific fliers again bomb the Philippines, Balik Papan, on Borneo and Celebes.
Prime Minister Churchill and Foreign Secretary Eden arrive in Moscow for conference with Premier Stalin.

10th Gen. Hodges issues ultimatum to German commander and the Mayor of Aachen to surrender by 10:50 AM or be destroyed.
Adm. Halsey's 3rd Fleet and carrier planes attack Ryukyu Islands. Destroy or damage 58 ships and destroy 89 planes.

11th German city of Aachen ignores Gen. Hodges ultimatum to surrender. After 1 hour's grace dive-bombers and 200 big guns begin pounding the city.
Red Army advances to East Prussia border west of Kaunas.

12th U.S. 1st Army continues its destruction of Aachen.
1,000 Allied bombers smash the Antwerp area to the Ruhr. U.S. 8th Air Force bombs Bremen and Osnabrueck. U.S. 15th Air Force in Italy bombs Bologna.
Adm. Nimitz's fleet and carrier planes raid Formosa. In a 2-day attack they destroy 395 planes and sink 100 ships. We lose 45 planes.

13th Greek patriots take control of Athens.
Japs capture Foochow, major port on China's cast coast.

14th 3,000 Allied heavy bombers hurl 8,500 tons of high explosives on Cologne, Duisburg, Kaiserslautern and Saarbruecken in Germany.
100 B-29 bombers raid Okayama.
Japs capture Kweiping in China.

15th RAF bombs Duisburg and the U.S. 8th Air Force raids Cologne for the 2nd consecutive day.

16th U.S. superfortresses bomb Formosa again. U.S. carrier aircraft raid Aparri, in northern Luzon, and also the Manila Bay area of the Philippines.
U.S. bombers pound Paramushiru in the Kuriles, Wake and Marcus Islands.

17th Superfortresses again bomb Formosa.
1,300 heavy bombers from the U.S. 8th Air Force pound Cologne, Germany.

18th U.S. troops take over half of Aachen. Hitler orders all men from 16 to 60 to register for the new Storm Guard.
Navy Department announces 3,080 Jap planes destroyed and 905 ships sunk from June 6 to Oct. 16. We lose 341 planes.

19th Gen. MacArthur's troops land in the Philippines.
U.S. 5th Fleet under Adm. Spruance lands troops on Suluan Island in Leyte Gulf, east of Leyte and south of Samar.
British troops recapture Tiddim in Burma.
British 8th Army in Italy bridges the Pisciatello River and captures 2 towns near Cesena.

20th U.S. troops complete the capture of Aachen.
2,000 allied bombers raid German industrial centers.

21st U.S. forces in the Philippines capture Tacloban, the capital of Leyte.
Adm. Nimitz's fleet supporting the invasion destroys 50 Jap planes and 3 ships during attacks on Jap targets.
British Navy completes 3-day air and naval attack on the Japheld Nicobar Island group in the Bay of Bengal.
250 U. S. bombers from Italy raid western Hungary in support of the Russians' moving on Budapest.

22nd British and U.S. bombers raid German targets at Hamm, Muenster, Brunswick, Hanover and the inland port of Neuss.

23rd United States, Russia and Britain recognize Gen. de Gaulle's regime of France.
Red Army smashes into East Prussia.

24th Carrier planes of the 3rd Pacific Fleet spot and attack large Jap naval forces moving toward Leyte.
Russian troops capture Chust, the 1st important town in Czechoslovakia to be liberated.

25th U.S. Navy seriously damages and routes Jap fleets in the Pacific off the Philippines. Sinks or damages 48 vessels, including 11 battleships.
U.S. superfortresses smash Jap key aircraft plant at Omura, Kyushu. Lose 1 B-29.
2,200 U.S. and British bombers raid oil targets in the Reich.
U.S. 5th Army in Italy captures Mount Belmonte.

27th British troops capture Tilburg and 'sHertogenbosch, 2 big Netherlands strongholds.

28th More than 750 RAF heavy bombers raid Cologne. 350 U.S. bombers hit Hamm and Muenster.
Bulgaria signs armistice terms with Russia, the United States and Great Britain in Moscow.
War Dept. announces the release of Gen. Stilwell from his command in the China-Burma-India theater. Gen. Wedemeyer to assume command of American forces in China and Gen. Sultan of those in Burma and India.

29th U.S. troops capture 2/3 of Leyte Island. Navy Dept. announces the 2nd battle of the Philippines Sea lasted from Oct. 22 to 27. Destroy 2 battleships, 4 carriers, 6 heavy and 3 light cruisers, 9 large destroyers or cruisers. Only 2 escape unhurt.

30th 3rd Fleet planes sink 1 ship in Manila Harbor and damage 2 more. Shoot down 90 planes.
The 24th Div. in the Philippines clears the Japs out of Jaro, advances north to join the 1st Cavalry.

31st British planes raid Cologne. Robot bombs hit England.

For Heroism and Service

LEGION OF MERIT

CAPT. NORVEL H. BARNHART, for exceptionally meritorious services from 29 Nov 42, to 17 Aug 43 in the European Theater of Operations. Address: 114 Pearl Ave., S. Watertown, N. Y.

SILVER STAR (Posthumously)

CPL. WILLIAM M. LANEY, while acting as a tank commander on 22 Jan 44 during the Italian campaign, succeeded in routing a large number of enemy troops and enabled the supporting infantry to capture several prisoners. Noting a German infantryman taking aim on an American officer, he dispatched the enemy with a burst from his machine gun. Between 28 and 31 Jan 44 he frequently exposed himself in order to bring fire to bear on the enemy and succeded in destroying five enemy tanks.

1ST LT. GERALD A. ROZEN, for skillfully directing fire against the enemy from his forward observation post in Italy on 12 Feb 44. Constantly exposed to artillery, mortar, and small arms fire, he continued shouting his orders until he deemed it necessary to seek a position affording better observation. He made his way, crawling and creeping across rugged terrain covered by intense enemy fire, toward a vantage point from which he again directed effective fire. Although his position was shelled continuously, he displayed extraordinary coolness in transmitting his orders and continued directing artillery fire against the advancing enemy until he was fatally wounded by an enemy shell blast. His outstanding courage and unshaken fortitude greatly inspired all who witnessed his deeds.

2D LT. CHARLES L. SCHARRER, for skillfully judging and occupying positions on a hill in action in Italy, on 11 Feb 44. He then moved across the rugged terrain to his OP, which was exposed to the shelling of artillery and mortars, and directed accurate fire on numerous enemy gun positions, knocking them out. He disdained personal security in the face of tremendous enemy fire and tirelessly transmitted his orders until a direct hit upon his position killed him. His magnificent courage, calmness under fire, and devotion to duty greatly inspired all who witnessed his acts.

SILVER STAR

T/5 JOSEPH A. CURCIO, 374 Genessee St., Buffalo, N. Y.
T/4 LEON RAUCHWERGER, 520 W. 139th St., New York, N. Y.

For proceeding in an ambulance across a large open field, under constant enemy fire and observation, to the aid of some casualties in a draw about 2,000 yards from the battalion aid station, during the campaign in Italy in Nov 43.

SGT. RAYMOND B. ALKIRE, for directing the fire of his battalion in an effort to reduce three enemy strongpoints during the Italian campaign, on 30 Jan 44. The attack of the infantry company to which he was attached was temporarily halted by these three hostile strongpoints. Despite machine gun fire which came within a few feet of him, and enemy artillery shells which exploded within 25 yards of his exposed position, he adjusted artillery fire on the enemy, silenced the strongpoints, and enabled the infantry to advance. Address: Walkersville, W. Va.

1ST LT. CHARLES B. ANDERSON, for adjusting fire on an enemy battery while on aerial Field Artillery mission in Italy on 12 Apr 44. At this time approximately 30 enemy planes attacked various installations on the beachhead and a terrific American antiaircraft barrage was raised to break the attack. Though greatly endangered by this antiaircraft fire he refused to land but continued to adjust fire on the enemy battery. The outstanding courage, aggressiveness, and devotion to duty displayed are consistent with the finest traditions of the Armed Forces and are deserving of the highest praise. Address: 132 Centennial Ave., Sewickley, Pa.

SGT. ELMER C. ANDERSON, for action at San Fratello, Sicily, on 5 Aug 43. His battery received a heavy shelling in which 40 rounds of enemy artillery fire fell within 15 minutes. One of these rounds set afire the camouflage net of a gun section which in turn ignited numerous powder bags and 105-mm high explosive shells stored under the net. While these rounds were exploding Sgt. Anderson, in charge of a gun located about 30 yards away, saw that his own section was endangered and, leaving his own place of security, initiated and directed removal of his howitzer to a safer position, thereby saving one-third of the battery's remaining fire power. Address: RFD 2, Lamberton, Minn.

MAJ. MAURICE K. BROWN, for repeatedly exposing himself to continued mortar and artillery fire, while descending a trail in the vicinity of Mount Defensa, Italy, on 6 Dec 43. He was caught in a heavy concentration which killed four of our infantry and wounded several others. He gave first aid to the wounded, then proceeded over a stretch of the trail and open ground which was receiving extremely heavy shell fire in order to notify litter bearers where the wounded were located. Address: 2021 E. Eighth St., Tucson, Ariz.

1ST LT. PHILLIP A. CHOCKLEY, for fearlessly moving over exposed terrain, carefully dispersing his men, and encouraging them in the face of a terrific bombardment in Italy, on 20 Nov 43. He skillfully administered first aid when one of his men was seriously wounded in the barrage, and assisted in the immediate evacuation of the stricken soldier. He courageously maintained close supervision and control throughout the deadly fire. Address: Shelbyville, Tenn.

LT. COL. RALPH E. COLE, for gallantly exposing himself to the intense fire of enemy guns, while a field artillery battalion commander in the Southwest Pacific on 22 Apr 44. In utter disregard for his personal safety he made a reconnaissance for battalion positions. This reconnaissance extended over two miles into enemy-held territory. Information gained was valuable. Address: 820 Lexington Ave., El Monte, Calif.

BRIG. GEN. MILES A. COWLES, for advancing before his division artillery CP to coordinate artillery fires for an attack on the town of Altavilla, Italy. When he had successfully completed his self-assigned mission he determined to remain in the forward artillery positions overnight, although a heavy shelling from enemy artillery was anticipated. When the furious barrage began Gen. Cowles fearlessly moved from position to position, advising the men, and by his very presence assuring them of ultimate achievement of their goal. His calm demeanor and steady assurance under the harrowing circumstances inspired the gun crews to a high peak of courage and efficiency, and the warmth and strength of his personality encouraged the men to work tirelessly in an effort to emulate their commanding general's valor.

CPL. PAUL R. DAVIDSON, for going to the aid of a wounded roldier during a heavy enemy artillery barrage during an assault in Italy, 3 Dec 43. Skillfully rendering medical assistance while exposed to the increasingly hazardous fire, he was able to evacuate the wounded man. He then courageously continued forward to an advance field artillery OP from which he calmly directed accurate fire against the hostile emplacements. On 16 Dec 43, when assigned an observation mission, he determinedly pushed forward even when hurt by the concussion of a shell which had exploded a few feet from him. Address: 3604 Orchard St., McKeesport, Pa.

LT. COL. KERMIT L. DAVIS, for gallantry in action in the North African Theater of Operations on 10 Nov 42. Although he was exposed to the fire of hostile snipers and riflemen whose bullets barely

missed him and was painfully wounded by fragmentation of artillery shells, he continued the observation and personal supervision of his batteries during an enemy attack. Address: 3624 T St., NW., Washington, D. C.

CPL. WILLIAM C. DEAVER, for making repairs on severed communication lines at Bougainville on 11 Mar 44. Enemy action had broken the communication lines running from his OP; he ignored heavy hostile fire to make repairs and though wounded in the back by a shell fragment courageously worked until the laying of new wire was completed. Address: 329 Hopley Ave., Bucyrus, Ohio.

PFC. ROY W. EVERT: when the man with whom he was sharing a double foxhole in a night perimeter was mortally wounded in the Southwest Pacific on 20 Nov 43, he left the comparative safety of the foxhole and crawled to the aid station. After acquiring first-aid materials he worked his way through intense fire back to his foxhole. Although his gallant attempt to save his comrade's life was unsuccessful, he greatly relieved his suffering before he died. His selfless, determined loyalty is in the highest tradition of the military service. Address: Lexington, Neb.

1ST LT. ROBERT R. EYLES, for advancing over open ground under heavy enemy machine gun and artillery fire while a forward observer with an infantry battalion in Italy on 14 Oct 43. He set up his OP on the shoulder of a hill under constant enemy fire, endeavoring to observe the enemy artillery firing. He was wounded by shell fragments and evacuated. Address: 1644 Brookline Blvd., Pittsburgh, Pa.

PVT. JOHN GENNA, for rendering first aid to wounded men during a furious artillery shelling in Italy on 18 Mar 44. Despite the hazards of the shell-blasted field, he exposed himself to continuous intense shelling, moving from one gun position to another. Often stunned by the shell bursts, he continued treating the men, helping them to endure the pain until they could be evacuated. By his capable and intelligent help in handling of casualty cases in the inferno and confusion resulting from numerous direct hits by the enemy artillery he aided in saving the lives of many comrades. His gallant actions reflect great credit upon himself and the Armed Forces of the United States. Address: 115-26 169th St., Jamaica, N. Y.

2D LT. HERBERT GREENBURG, while acting as a forward observer during an attack in Italy on 8 Dec 43, realized that observation was impossible from a position with leading elements of the company. To attain a better vantage point he crawled forward under intense artillery, mortar, and small arms fire, reeling out a wire line and carrying a telephone. Heedless of the grave danger from enemy fire he pushed himself forward and reached a good observation point. Address: 12 Pratt St., Essex, Conn.

SGT. STEVE H. JAVORSKY, for playing a large part in repulsing an enemy attack on Hill 700 at Bougainville on 12 Mar 44. He wiped out a machine gun position with hand grenades and killed one Japanese and wounded two others with rifle fire. He then braved heavy hostile fire to help three wounded comrades to the cover of his own foxhole. His courageous actions protected the only communications in the vicinity and enabled a vitally needed OP to remain in operation. Address: 802 Franklin St., Youngstown, Ohio.

S/SGT. GRIFFITH JONES, for going into the midst of counterbattery fire during the campaign in Italy in Nov 43 to render first aid and evacuate two men of his battery who had been hit by the shelling. His action in plain view of the enemy, who had been maknig a precision adjustment on a nearby vehicle, assisted materially in saving one man's life. Address: Forestport, N. Y.

1ST SGT, FELIX J. MATHEIS, for entering an areas in the line of sniper fire and aiding two wounded men during the organization of his battery positions in the Southwest Pacific on Feb 44. Two noncommissioned officers were wounded by sniper fire and lay in the open, approximately 20 yards in front of the position. He caused their evacuation with outstanding calmness and efficiency. Address: 58 Stanwix St., Brooklyn, N. Y.

CAPT. DONALD P. MICHAEL, while serving as an artillery liaison officer during the campaign in Italy on 30 Jan 44, crawled 100 yards through mud in a ditch covered by heavy enemy machine gun fire and 20-mm cannon fire to establish an OP near a disabled tank. His direction of fire was so effective that the infantry was then able to take its objective. Later he was driven from his post by artillery fire which demolished the tank. The next day he twice successfully directed fire from posts subject to immediate machine gun and artillery fire. Address: Trousdale, Kan.

S/SGT. ZENUS E. NEAL, for laynig wire across several hundred yards of open terrain in the vicinity of Mount Maggiore, Italy, on 9 Dec 43. He exposed himself voluntarily to lay wire to an OP so that fire could be adjusted on the enemy, who had our infantry pinned down by artillery fire. Address: Hope, Ark.

SGT. WILLIS B. NESMITH, for moving his tank destroyer from the cover of a house in action near Cisterna de Littoria, Italy, on 3 Feb 44, to engage six German tanks. Although one of the tank destroyer's motors was disabled, and he was under direct fire so severe that one shell actually glanced off the front armor of the destroyer, he knocked out the lead Mark VI tank, disabled a second, and dispersed the remainder. Address: Barney, Ga.

CPL. JACK T. NOLAN, for making repairs on communication lines while under heavy fire during the Italian campaign, on 31 Oct 43. He learned that wire communication had been severed by bursting shells. He twice left his defiladed position at an OP and braved an area that was being shelled heavily to find and repair the breaks in the line. Although shells burst within 10 yards of him and flying fragments missed him only by inches, he continued at his task and soon had restored communications on both occasions. Address: 1127 Walnut St., San Luis Obispo, Calif.

SGT. WALLACE B. O'HARA, for gallantry in action at San Fratello, Sicily, on 5 Aug 43. His battery received a heavy shelling in which 40 rounds of enemy artillery fell in a space of 15 minutes. One of these rounds set fire to the camouflage net of the second gun section, which in turn ignited numerous powder bags and 105-mm ammunition. He left his place of safety and removed the gun to a safe place. Address: Hamar, N. D.

S/SGT. JACOB SILVER, for action during the Italian campaign, on 24 Nov 43. When the battery kitchen truck, containing both food and ammunition, was hit during an intense concentration of enemy artillery and Nebelwerfer fire, he daringly made a singlehanded effort to save the food and equipment. His magnificent courage and aggressive determination saved supplies which were difficult to replace at that time and inspired all who witnessed his deed. Address: 1056 Packard Dr., Akron, Ohio.

2D LT. LISTER T. SNOW, for manning a .50-cal. machine gun in an open position when an enemy counterattack threatened his howitzer position in Italy on 13 Sep 43. Though under enemy small arms and mortar fire he placed extremely effective fire on the attacking enemy. He inflicted heavy casualties, silenced the fire of two machine guns and a mortar, and destroyed two enemy vehicles. His courage and determination reflect high credit on the Armed Forces of the United States. Address: 111 S. First St., Tonkawa, Okla.

2ND LT. JAMES T. P. TAGUE: during the Italian campaign on 10 Feb 44, he, a forward observer, though wounded and driven from his position by fire from a 75-mm SP gun, proceeded through heavy fire to another OP from which he directed artillery fire to neutralize the enemy gun. In spite of his wounds he refused to be evacuated for 11 hours, while he continued to direct fire in support of an infantry attack. Address: 3036 36th SW, Seattle, Wash.

PVT. LUTHER H. THOMPSON, for assuming the duties of observer when the officer in charge of his observation party was badly wounded by enemy shell fire in Italy, on 30 Dec 43. Pvt. Thompson, though suffering from frozen feet, took over the observer's duties and delivered effective fire on enemy armor and troop concentrations. He remained at his post under heavy enemy fire, yielding to hospitalization only when assured that sufficient relief personnel had arrived to man the OP. His actions exemplify the high traditions of the military service. Address: 2840 West Park, Oklahoma City, Okla.

1ST. LT. THOMAS H. TROWER, for registering the division artillery on check points in enemy territory and continuously adjusting on enemy installations and targets of opportunity throughout operations while flying as artillery observer in a SOC-3 airplane in the Pacific Area, 1 Feb 44. During this period he averaged 9½ hours per day in the air, continuously performing his mission with great efficiency and without regard for personal fatigue or danger. Address: 1406 Hillerest Dr., Bartlesville, Okla.

CAPT. LEONARD E. WEISENBURG, for remaining at his OP under heavy artillery concentrations and point blank small arms fire during the Italian campaign, on 29 Feb 44. The enemy came within 200 yards of his OP and directed machine gun and rifle fire at him. Although enemy shells burst 10 to 15 yards from him and small arms

fire knocked his telescope out of his hands, he continued adjusting artillery fire that was a major factor in the repulse of the enemy. Address: 11623 Huston St., N. Hollywood, Calif.

PVT. HAROLD A. WELCH, while a member of an artillery forward observation party in the Kwajalein campaign, exposed himself to enemy fire from three directions. He advanced through an open area to an enemy pillbox, attacked it with grenades and submachine gun, and destroyed all the enemy therein. Shortly thereafter he voluntarily entered an area occupied by the enemy, located two missing soldiers, and brought them to safety through heavy enemy fire. The coolness and daring of these acts are in keeping with the highest traditions of the service and contributed greatly to the effective maintenance of artillery fire in the forward area. Address: Harrison, Ark.

SOLDIER'S MEDAL

CPL. CLIFFORD J. P. KNAPP, West Caldwell, N. J.
PVT. ROBERT C. LUNDEEN, 2618 Kilburn Ave., Rockford, Ill.
T/4 JOHN LICHTEY, 221 E. 32nd St., New York, N. Y.
PVT. ROBERT B. ROLLINS, Avoca, Iowa.

When a Navy dive bomber crashed into their battery's howitzer emplacement and caught fire, they freed the aerial gunner from the flaming wreckage although their own lives were endangered by possible explosions. Bougainville, Solomon Islands, 19 Feb 44.

T/5 EDWIN A. BUSH, for going to the rescue of an officer and an enlisted man who were stranded in an isolated mountain OP on Mt. Mainarde, Italy, on 29 Dec 43. Cpl. Bush and three fellow soldiers attempted to reach the isolated men, but because of the blizzard and steep climb his companions found themselves exhausted and unable to continue. He voluntarily proceeded alone; reaching the OP he succeeded in bringing its stranded occupants to safety. Address: RFD 6, Watertown, Wis.

SGT. JAMES W. COCHRAN, for outstanding service in extinguishing a fire caused by a camouflage net burning near his artillery section. By his heroic actions he saved a valuable piece of equipment and prevented injury to nearby personnel. In Italy, Mar 44. Home address: RFD 3, Lucedale, Miss.

SGT. CHARLES A. CUBLEY, for saving the lives of five enlisted men who were trapped in a foxhole by burning powder in Italy, in Mar 44. He immediately left his nearby foxhole, threw an overcoat over the flames and carried the badly burned men to safety. Home address: 120 Conti St., Hattiesburg, Miss.

PVT. FRANK JANUSIS, for rescuing a soldier in distress while undergoing amphibious training in a heavy surf off a Southwest Pacific island on 3 Mar 44. The amphibious vehicle in which he was riding was struck by a 15-foot wave just as it reached the shore. He and several others were thrown into the water, one soldier being pinned under the vehicle. Pvt. Janusis, with complete disregard for his own personal safety, braced himself against the vehicle which was being moved about by the power of the surf, and rescued the soldier, thereby saving his life. Address: 12 Fairview Ave., Port Washington, N. Y.

PVT. FRANKLYN G. LEFEVRE, for rescuing an exhausted soldier 75 yards from shore in Lake Shelby, Miss., on 18 Jun 44. At the risk of his life, Pvt. LeFevre swam to the man in distress and, despite his frantic struggles, brought him safely to shore. Home address: 344 Mansion St., Poughkeepsie, N. Y.

1ST LT. WALTER H. LUPKE, JR., for safely disposing of a live bomb which had missed its mark and fell into the lap of an enlisted man in a pit from which targets were operated. Knowing that an explosion was imminent, Lt. Lupke ran up the parapet, picked up the bomb and threw it out, whereupon it instantly exploded. Home address: 2211 Anthony Blvd., Fort Wayne, Ind.

T/4 FLOYD A. MOORE, for aiding in the extinguishing of a fire in a stack of 155-mm ammunition on 3 Jan 44, near Pentano, Italy, while under heavy enemy shelling. Through quick thinking and courageous action, he helped control a dangerous conflagration. Address: 504 Ptolemy St., New Orleans, La.

S/SGT. JOSEPH P. POINELLI, for extinguishing a blazing fire in a half-track in Italy in Dec 43. With complete disregard of his personal safey and despite a warning that the gasoline would explode, he climbed into the half-track amid the blazing gasoline and exploding small arms ammunition and personally put out the fire. His courage and quick thinking reflect credit upon himself and exemplify the highest traditions of the military service. Home address: RFD 10, Fairfield, Conn.

SGT. RALPH F. PUGH, for action in extinguishing a fire in an ammunition stack near Venafro, Italy, on 18 Nov 43. When he noticed the fire caused by an enemy shell, he immediately went to the burning ammunition and began to extinguish the blaze. Other men of his battery came to his aid, and he directed their efforts in smothering the fire. Address: Mahomet, Ill.

S/SGT. EARL J. ROBERSON. When blasts of nearby guns crumbled the walls of a shell-wrecked building being used for a kitchen in Italy in Feb 44, in the midst of falling debris and swaying walls, he removed all undamaged food and equipment. His courage in preventing the loss of government property reflects credit upon himself, his unit, and the military service. Home address: Ovett, Miss.

LT. COL. ARTHUR SNYDER, for exposing himself to the danger of exploding 105-mm ammunition in an effort to extinguish the fire which was burning a self-propelled gun and ammunition stacked near him, during an Italian campaign on 17 Feb 44. He ceased fighting the fire only after he saw that the ammunition and gun were too far gone to be saved. Home address: 19 LaFayette Ave., Hingham, Mass.

2D LT. CHARLES E. STILLWAGON, JR., for saving the life of a soldier who had fallen and was swept downstream in the San Antonio River, near Merle Ranch, Hunter Liggett Military Reservation, on 29 Feb 44. At the risk of his life Lt. Stillwagon plunged into the stream, made his way to the soldier and held his head above water and was assisted to the shore. Home address: 1216 Las Tunas Dr., San Gabriel, Calif.

PFC. ROBERT D. SUDLOW, for rescuing a comrade while swimming at a beach in Italy, 5 Jun 43. Although they had previously refused to go more than 25 yards from shore because of the strong undertow, they plunged into the raging surf, and battled their way to shore. Home address: Wellton, Ariz.

1ST LT. WALLACE H. SWILLEY, JR., for action near Pentano, Italy, on 3 Jan 44. An ammunition stack belonging to his battery was struck and set afire by an enemy shell. After seeing his men had taken shelter in foxholes, he rushed to the fire and aided in extinguishing the flames with water taken from a nearby ditch. His quick thinking and prompt, courageous action prevented an even more dangerous fire and explosion. Home address: Box 181, High Springs, Fla.

OAK LEAF CLUSTER TO BRONZE STAR

S/SGT. MALCOLM C. BLEDSOE, 325 Howard Ave., Jeffersonville, Ind.
T/4 RAYMOND H. VOGHTS, R.F.D. 1, Girard, Kan.

For maintaining communications in direct support of combat operations 8 to 24 Mar 44 at Bougainville.

CPL. MAX ALTSCHULD, for distinguishing himself by daring and courageous conduct under fire during action in Italy, on 1 Mar 44. Address: 2301 Avenue Y, Brooklyn, N. Y.

LT. COL. NORMAN E. WHITNEY, for the capable commanding of all artillery elements in the Wickham, Viru, and Segi operations and in the Munda area, from 17 Jul to 7 Aug 43, at New Georgia. He skillfully directed supporting fire which made possible the advance of infantry troops. When all means of observation failed to locate the source of severe enemy fire, he fired on suspected areas, employing a careful process of elimination which finally silenced the enemy guns. Home address: 143 Webster Ave., Bangor, Me.

BRONZE STAR

SGT. NOLAN B. HIMES, Box 174, Centerville, Ohio.
SGT. LEROY E. LEWIS, 534 Adams St., Dayton, Ohio.

For unusual leadership, perseverance, and devotion to duty while serving as chief of a 155-mm howitzer section during action at New Georgia and Bougainville from 17 Nov 43 to 29 Mar 44.

PVT. HARVEY J. KELLAR, 145 Temple, Detroit, Mich.
PVT. MAX E. REYNOLDS, R.F.D. 2, Pickney, Mich.

While on three patrols into enemy territory, from 15 Feb to 10 Apr 44, at Bougainville, they helped maintain communications despite the difficulties of terrain and enemy action.

PVT. PETER S. FABRY, 1508 N. Maplewood Ave., Chicago, Ill.
PVT. FRANCIS A. GALLAND, 83 Riverside Ave., Buffalo, N. Y.

On 22 Jan 44, in Italy, they were members of a liaison section attached to an infantry regiment which had been ordered to cross a strategic river in an assault on enemy positions. After crossing the river in the face of furious artillery, mortar, and machine gun fire, they were ordered to withdraw to the near bank. They established an OP and, constantly harassed by enemy shelling, remained at that post for ten hours, tirelessly working to maintain communication with their battalion. By their dogged determination to perform their assigned tasks in spite of all resistance, they made possible the continuous supporting fire of the artillery.

T/5 BENJAMIN E. BORD, 440 Tenth St., S. Wisconsin Rapids, Wis.
PVT. CHARLIE F. BYRNE, RFD 1, Sterling, Va.
SGT. LEONARD F. COLLINGSWORTH, Dodd City, Tex.
CAPT. RICHARD A. DANZI, 4828 Chevy Chase Blvd., Chevy Chase, Md.
T/4 NORMAN H, DECK, RFD 2, Hoskins, Neb.

For working tirelessly as members of the communications section of their battalion, in action in Italy, from 21 Nov 43 to 27 Dec 43. During this period they helped lay a total of 72 miles of wire, much of it in forward positions at OPs where many enemy artillery weapons were shelling almost constantly.

PVT. J. T. BENCH, RFD 2, Madill, Okla.
PFC. GARLAND G. BURSON, 222 Cottonwood St., Houston, Tex.
CPL. JAMES C. COIN, Krum, Tex.
T/5 HARLEY J. KUEHL, RFD 2, Kremlin, Okla.
PVT. FRANK C. NEWKIRK, 827 Eighth St., Secaucus, N. J.

For fighting a fire in a battery gun position during intense shelling in Italy, on 11 Apr 44.

PFC. FRANK A. BEZCCYSKI, 20144 MacKay, Detroit, Mich.
T/4 HOBERT M. LOCKE, Box 234, Pine Grove, W. Va.
PFC. WILLIAM SMITH, Durfee St., Providence, R. I.

For performing with outstanding merit and efficiency the duties as linesman and telephone operator in a combat field artillery liaison section in the Southwest Pacific from 5 to 17 Jul 43 and from 4 to 5 Aug 43, over rugged jungle terrain and through swampland subjected to good hostile organized observation and fire.

PFC. RALPH BENNETT, 89 Superior St., Providence, R. I.
T/SGT. MAURICE E. PERREGAUX, 342 Brightwood Ave., Torrington, Conn.
CPL. ELMER L. ROBERTSON, 69 Winchester St., Providence, R. I.
PFC. FRANCIS E. RUNDELL, Puposky, Minn.
PVT. FRANK R. SMITH, JR., 34 Durfee St., Providence, R. I.

For being conspicuously active as telephone linesmen and operator and as assistants to the communications chief, from 30 Jun to 5 Aug 43, in the Southwest Pacific.

CPL. JOSEPH A. LEAP, RFD 2, Elkton, Va.
PFC. CHARLES E. PABST, JR., 23 Kirk St., Winchester, Mass.

For action on 21 Jan 44 and 22 Jan 44, during the campaign in Italy. As members of a liaison section with an infantry regiment which had been ordered to cross a strategic rivet in an assault on enemy positions, they faced furious artillery, mortar, and machine gun fire. They helped establish an OP, though constantly harassed by the enemy shelling, and remained at the post for ten hours.

CPL. EDWIN S. SPRAGUE, RFD 1, Ellsworth, Me.
PFC. FRANCIS J. WALSH, 1211 E. Main St., Stamford, Conn.
CPL. CURTIS W. WEST, Millbridge, Me.

With Field Artillery units located on as many as five islands in the Southwest Pacific from 30 Jun 43 to 6 Oct 43, they assumed the initiative in establishing and maintaining communications with these units.

PVT. JAMES D. CHEUVRONT, RFD 1, Chester, W. Va.
PVT. HAROLD G. FICK, RFD 2, Reading, Pa.
CPL. JOHN T. JONES, Fuquay Springs, N. C.
PFC. WILLIE A. JONES, RFD 1, Pink Hill, N. C.
S/SGT. WADE H. JOYNER, 10 Dunn St., New Bern, N. C.
T/5 FREDERICK A. KEATS, JR., Tampa, Fla.
PFC. JAMES M. MOORE, Cramerton, N. C.
PFC. THOMAS B. MOSIER, RFD 2, Bangs, Tex.
PFC. GONAZALO RIVAS, 774 Pinton Ave., New York, N. Y.
PVT. ROBERT R. WILKENSON, RFD 1, Hedley, Tex.

Under direct enemy artillery fire at Bougainville on 14 Mar 44, with shells exploding as close as 15 yards, destroying material and treating an untenable situation, they continued with courage and fortitude to service their guns and continue with the counterbattery missions that eventually silenced the enemy.

CPL. KENNETH J. BRET, 832 Titkin, Colorado Springs, Colo.
T/4 CHARLES L. CAMERON, RFD 2, Lindsay, Okla.
PFC. HENRY J. ARCH, 590 E. 137th St., New York, N. Y.
PVT. WILLIAM E. GRENZ, 643 E. Seventh St., Brooklyn, N. Y.
PVT. ROBERT D. McMILLAN, 1037 85th Ave., W. Duluth, Minn.

While their battery was performing the mission of laying battery volleys of harassing fire on the enemy in Italy on 16 Apr 44, it was heavily counter-batteried. After one of the first rounds had set fire to the camouflage net and gun cover of No. 2 gun section, they came out of the gun pits and proceeded to extinguish the flames. With shells bursting only about 20 yards from them, these men remained with their task for some 20 minutes.

CPL. THURSTON C. ENGLUND, 45 Main St., Reading, Mass.
CPL. JAMES E. FUNK, Moville, Iowa.
SGT. WILLIAM C. HIGHTOWER, Winter Haven, Fla.
CPL. ROBERT A. NUNNELEE, RFD 1, Rateliff, Ark.
S/SGT. FRED E. SQUIRES, RFD, Branchport, N. Y.
CPL. BENJAMIN F. TOWNSEND, Winona, Miss.

For restoring communications disrupted by enemy artillery on Bougainville 24 Mar 44, while enemy shells were falling in the vicinity.

2D LT. FOREST E. ADAMS, for voluntarily moving out to a forward slope of a hill beyond the infantry outpost and in full view of the enemy in Italy on 17 Feb 44. While observing the bursts and making corrections on his original adjustment, the gun on which he was firing started shelling his position. Heedless of personal safety, he calmly continued to refine his adjustment until it was satisfactory and effective. Address: 315 Forest Park Blvd., Janesville, Wis.

SGT. RAYMOND B. ALKIRE, for crawling 200 yards across the open fields through intense machine gun and sniper fire and artillery shells which burst within 20 yards of him, in Italy on 31 Jan 44. The successful accomplishment of his mission made possible the concentration of field artillery fire upon the enemy, which repulsed the enemy attack. Address: Walkersville, W. Va.

CPL. WILLIAM C. ANDERSON, for laying wire from the division FDC near Mt. Austen, Guadalcanal, from 10 Jan 43 to 12 Jan 43, to two Field Artillery battalions. He completed the establishment of communications in a calm and capable manner despite heavy enemy sniper fire. Address: Anita, Pa.

T/5 EDWARD W. ANDRESEN, for extinguishing a fire in a camouflage net near an M-10 tank destroyer in Italy on 13 Sep 43. A direct hit on the tank destroyer knocked a .50-cal. machine gun from its mount and exploded its ammunition, setting fire to the camouflage net and waste inside the M-10. His efforts saved a valuable and much needed piece of equipment for further use against the enemy. Address: RFD 1, Blair, Neb.

CAPT. WILLIAM B. ARMSTRONG, for directing the evacuation of casualties in his battery area, and assisting in the treatment of wounded, during a heavy enemy artillery barrage in Italy on 24 Apr 44. His courage under fire was an inspiration to his troops suffering their first casualties due to enemy action. Address: 601 N.W. 37th St., Oklahoma City, Okla.

S/SGT. JOHN W. AVERY, for organizing and assisting in the removal of casualties to shelter, after a heavy and intense enemy counterbattery attack in the vicinity of Cassino, Italy, on 15 Feb 44. He refused treatment for his own wounds until other members of his section had received medical attention. Address: RFD 1, Selma, N. C.

MAJ. WILLIAM N. BAILEY, for playing the responsible part in halting further Japanese attacks after his guns brought down six hostile aircraft and probably destroyed four others in the Russell Islands, from 22 Feb 43 to 28 Feb 43. Address: 48 Gerald St., E. Providence, R. I.

PVT. FRANCIS F. BALL; while under enemy mortar fire which was directed on the area throughout the day, in the vicinity of Mass Capaldi, Italy on 12 Jan 44, he maintained wire communications from an advance OP to gun positions. Address: 1211 E. Second St., Ottawa, Ohio.

SGT. RAY BARNES, for coolness and sustained efficiency under fire, which provided a notable example for the men of his section

in Italy from 1 Oct 43 to 1 Apr 44. He efficiently trained replacement gunners and ammunition handlers assigned to his battery, and his ability to devise shortcuts in the firing and emplacement of his gun provided a valuable contribution to the effectiveness of his organization. Address: RFD 1, Forest City, N. C.

PFC ROBERT T. BERRY, for maintaining communications during heavy enemy shelling in Italy on 22 Feb 44. When the wire line between his battery and the FDC was damaged by heavy hostile shelling he, aware of the necessity of maintaining contact between these two points, ignored the heavy artillery fire and started laying a new line from his battery position. Although the shelling lasted for two hours, he dauntlessly kept at his task until completed. Address: 115 Kensington Ave., Meriden, Conn.

1ST SGT. KENNETH B. BLACK, near Humboldt Bay, Dutch New Guinea, from 22 Apr 44 to 5 May 44, worked long hours in supervising housing, defense, and other details around the battery CP and relieved the battery commander of his administrative duties, allowing him to devote his full time to his duties as communications officer. Address: 119 Franklin St., Boise, Idaho.

MAJ. JOHN S. BLAIR, for performing in a most efficient manner the duties of operations officer of his battalion from 30 Jun 43 to 6 Oct 43 in the Southwest Pacific. His superior technical knowledge, keen judgment, and untiring efforts were largely responsible for the successful support which his battalion gave to the infantry during the entire operation. Address: 58 Governor St., Providence, R. I.

2D LT. MILTON BLUM, for delivering an urgently needed supply of maps to regimental headquarters through enemy-held territory in Italy on 26 May 44. By the successful completion of this hazardous mission he enabled the regiment to continue its advance with the benefit of these valuable maps. Address: 75 Cliff St., New York, N. Y.

T/5 JOHN F. BREITMEIER, for serving as radio operator with such skill and industry that he frequently acted as relay for the entire battalion net, during the Sicilian Campaign from 10 July 43 to 17 Aug 43. He assumed the additional duties of radio chief, served as instructor, and assisted materially in the maintenance of all his organization's radios. Address: Harlem, Mont.

CAPT. CHARLETON D. BROWN, for outstanding action near St. Elia, Italy, on 12 Feb 44, when his battery was subjected to intense artillery fire on a steep winding road on the forward slope of a mountain. A hairpin turn in the road made progress of the convoy extremely slow and a nearby powder dump fire brilliantly lighted the entire area. In an exposed and unprotected position, he coolly directed the guns and vehicles of his battery to their proper positions and, having cleared the road, showed his men where to take cover from the heavy shell fire. He remained exposed to intense fire until all personnel, vehicles, and guns of his battery had reached safety. Address: 1834 60th St., Kenosha, Wis.

T/5 EMORY W. BURK, for extinguishing a blaze in a 105-mm howitzer motor carriage on 17 Apr 44, during the Italian campaign. His prompt and timely action saved a valuable piece of equipment from destruction. Address: RFD 1, Box 42, Upperco, Md.

SGT. THOMAS W. BURKE, for quickly organizing his patrol, composed of enlisted men and natives, when they were met by enemy mortar, machine gun, and rifle fire during a reconnaissance patrol at Bougainville, 3 Apr 44. During this action, with disregard of his own personal safety, he laid a telephone line to the artillery observer when Jap 90-mm mortar shells were landing 25 yards away and one burst from a Jap light machine gun passed within one yard of his face. Address: 4152 E. 123rd St., Cleveland, Ohio.

PFC F. C. BURKETT, JR., for installing communications essential to field artillery fire at Baanga, Solomon Islands, 13 Aug 43. Aware of the vital importance of the telephone line and the urgency of the installation, he and another man carried the wire on their backs and laid 2½ miles of lines over treacherous jungle terrain, through enemy mine fields, and across 100 yards of water, connecting an OP on Kindu Point, New Georgia, and a foreward OP on Vella Cela Island. Address: RFD 1, Wildersville, Tenn.

T/SGT. AMORY E. BURNHAM, for repeatedly exposing himself to enemy fire at the front lines while he obtained essential data which contributed to the accuracy of the fire missions executed by his battalion from 9 Dec 42 to 8 Feb 43, at Guadalcanal. Address: Wilder Rd., Boston, Mass.

S/SGT. JOHN K. BURROWS, for assuming command of an antitank platoon whose mission was the emplacing and manning of 10 20-mm antiaircraft guns for air security of his battalion during the period 7 Jul to 5 Aug 43, in the Southwest Pacific. Address: 1928 Smith St., North Providence, R. I.

S/SGT. MAX W. CARNES, for maintaining and supervising the operation of radios in six separate nets and keeping them functioning when wire communications were knocked out by enemy artillery fire at Bougainville, from 8 to 24 Mar 44. Address: Greenville, S. C.

CPL. CALVIN E. CARPENTER, for occupying vital OPs on or very close to the front lines at Guadalcanal, from 5 Jan to 9 Feb 43. While exposed to enemy sniper and mortar fire he continued to observe and report valuable information which contributed to the success of the combat missions. Address: 14 Winslow Ave., Somerville, Mass.

LT. COL. THOMAS W. CASEY, for controlling a flash base survey and massing field artillery on enemy targets. Throughout enemy attacks on our perimeter, he worked 20 hours a day at Bougainville from 8 to 20 Mar 44. In many instances his prompt action was responsible for the neutralization of enemy field pieces and the accurate location of supporting fire in close proximity to our own troops. Address: 94 Franklin St., Allston, Mass.

T/5 FREDERICK Y. CHAMBERLAIN, for performing outstanding service in dual capacity as driver and orderly from 31 Jun to 6 Oct 43, in the Southwest Pacific. He accompanied the field artillery commander to the front lines almost daily under all conditions, proving himself reliable and of strong character. Those qualities were evident the night of an enemy attack on the division CP. In addition, in many cases he acted in the capacity of a liaison officer between the commanding general and units of the division artillery, delivering messages and instructions of utmost importance. Address: 10 Oak St., Ellsworth, Conn.

S/SGT. WACO D. COMPTON, for rescuing fellow soldiers from a dugout which had received a direct hit during a heavy concentration of heavy artillery in Italy on 3 May 44. Address: RFD 2, Comer, Ga.

PFC WARREN S. CONDRA, for aiding a wounded man during strong counterbattery shelling of the tank destroyer company area in Italy, on 3 Feb 44. While administering first aid the enemy reintensified the counterbattery fire. Seeing that the injured soldier was helpless to move, he shielded him with his own body against flying steel fragments. When the barrage subsided he took the injured man to a battalion aid station for further treatment. Address: 1421 Jennings St., Fort Worth, Tex.

SGT. GEORGE H. COUTURE, for rendering valuable assistance to the liaison officer in the adjustment of artillery fire during the advance from Zenana Beach to Munda Airfield at New Guinea, from 2 July to 5 Aug 43. Subjected to rifle, mortar, and machine gun fire from an enemy often only 100 yards distant and harassed by treacherous terrain and bad weather, he nevertheless performed his duties and contributed greatly to combat operations. Address: 54 Merchants Ave., Taftville, Conn.

MAJ. SAMUEL L. DAVIS, for services at Bougainville from 13 to 31 Mar 44 and at the outbreak of combat operations with hostile forces on 8 Mar 44. Special Service Officer of an infantry division, he volunteered for duty with the field artillery, his basic branch, due to the curtailment of SS activities during combat. He frequently conducted the entire bombardment of the destroyers from the bridge when spotter aircraft were not available, during operations along the coast of Bougainville. Address: 312 Mason Pl., NW, Canton, Ohio.

LT. COL. RENE L. DEBLOIS, for performing in a most efficient manner the duties of plans and training officer of his battalion from 30 Jun to 6 Oct 43, during a campaign in the Southwest Pacific. At all times during this campaign he was on duty day and night, resting only during quiet periods. His superior technical knowledge, keen judgment, and untiring efforts were largely responsible for the successful support which his battalion gave to the infantry during the entire operation. In addition to his assignment he also performed the duties of battalion executive officer, filling a vacancy then existing. Address: 30 Rye St., Providence, R. I.

CAPT. JOSEPH F. DOYLE, for performing outstanding work as liaison officer during the campaign against the Japanese at Guadalcanal in Jan 43 and at Vella LaVella from 5 Aug to 15 Sep 43. Address: 458 S. Gaylord St., Denver, Colo.

T/4 LARRY A. DREW, for conducting a difficult survey from the summit of a hill at Guadalcanal on 11 Jan 43. Although vulnerable to the fire of well-concealed enemy snipers, he continued his duties until the mission was accomplished. Address: Box 135, Westboro, Ohio.

CPL. THOMAS C. DREW, for action at Guadalcanal on 21 Nov 42. He rendered first aid to six wounded soldiers who were in the open and while enemy artillery shells were bursting in the immediate area. When he was not tending the wounded, he volunteered for duty with the shorthanded howitzer sections. Address: 197 Searight Ave., Uniontown, Pa.

SGT. CLEVELAND DUGAS, for applying first aid to a wounded officer in an OP at the front lines on 10 Mar 44 at Bougainville. Although under heavy enemy artillery fire, Sgt. Dugas immediately applied first aid, secured help, and carried the officer to a medical aid station while enemy shells continued to hit within close range of the route to the aid station. Address: Box 94-A, Breaux, La.

SGT. JOHN K. DUNLAP, for providing excellent antiaircraft protection against enemy planes while in action against the Japanese on Vella LaVella, from 15 to 20 Aug 43. Address: 1628 Ricardo St., Los Angeles, Calif.

S/SGT. WALTER J. DUSEL, for outstanding action during a heavy concentration of enemy artillery fire near Mignano, Italy, on 4 Feb 44. A shell landed near a message center and two men were wounded by fragments. While the other personnel left the scene, he remained with the casualties, phoned for medical assistance, then administered first aid to one of the seriously wounded men, and later assisted in the evacuation when the shelling had subdued. Address: 7 Dudley St., Rochester, N. Y.

COL. NORMAN J. ECKERT, for conducting the fire of his unit in a sound and intelligent manner on New Georgia from 5 Aug to 3 Oct 43. As acting div arty commander of an infantry division, and in spite of serious obstacles and rugged and difficult terrain, he conducted his operations efficiently and skilfully. In all operations he displayed superior qualities of leadership and technical skill. Address: 220 Whittier St., NW, Washington, D. C.

S/SGT. FRANK L. EDWARDS, for displaying exemplary leadership, courage, and efficiency in the discharge of his duties while in charge of a forward party with an infantry patrol in enemy territory on Bougainville from 7 to 18 Mar 44. Many times they were subjected to severe shelling but he refused evacuation and with inspiring leadership and calmness under tension helped evacuate the wounded and reorganized the party. Address: 115 W. Columbia St., Alliance, Ohio.

PVT. GENE F. EDWARDS, for voluntarily exposing himself to enemy observation in the vicinity of Mount Natale, Italy, on repeated occasions during the period 14, 15 Apr 44. He repaired broken wire lines between his battalion forward OP and the FDC. Although hostile artillery and mortar fire fell all about him and in spite of the fact that he had been instructed not to expose himself by servicing the lines during daylight hours, he persisted in working on the lines at the risk of his life. Address: RFD 2, Binger, Okla.

CAPT. ROBERT S. ELIAS, for laying wire across wide channels and lagoons to battalions on adjacent islands, at New Georgia, from 19 Jul to 10 Aug 43. Address: Ostrander, Ohio.

MAJ. JOHN J. FAHEY, for remaining in a forward OP and adjusting a destructive fire on Japanese positions, during the reduction of the Gifu strongpoint at Guadalcanal, from 1 to 31 Jan 43. When infantry elements were forced to withdraw he remained at his post, although vulnerable to enemy action as well as his own supporting fire. Address: 45 Bolton St., Marboro, Mass.

PFC CHARLES N. FAUL, for voluntarily and unhesitatingly leaving a place of security and extinguishing the flames in the motor carriage of a 105-mm howitzer, during a heavy enemy artillery concentration on his battery's area on 17 Apr 44. Address: Perintown, Ohio.

S/SGT. WALTER J. C. FESIK, for volunteering to lead a scouting party on 26 Jul 43 in New Georgia. The scouting party discovered the location of a Japanese emplacement. Returning to his post he assisted in adjusting fire which destroyed the enemy emplacement by two direct hits. Address: 643 Pine St., Providence, R. I.

CAPT. GEORGE T. FIELDING, III, for volunteering to conduct surveys for other battalions, after completing initial survey missions for his own batteries, at New Georgia, from 30 Jun to 5 Aug 43. Address: 20 W. North St., Stamford, Conn.

CPL. GEORGE FILIPEK, for performing in a superior manner his duties as battery recorder during the Sicilian Campaign from 10 Jul to 17 Aug 43. As his battery occupied new positions, he also served as computer and efficiently and quickly set up the FDC. Address: 3479 Plankington Ave., Cudahy, Wis.

T/5 JULIUS P. FRANA, for demonstrating a high degree of initiative, courage, and technical skill as a lineman for his battalion from 10 Mar to 13 Oct 43, at Bougainville. Under difficult conditions of heavy shell fire, hazardous terrain, and adverse weather conditions, he performed his duties with exceptional speed and efficiency. Address: Protivin, Iowa.

CPL. JOSEPH F. GLESTER: during an intense artillery barrage on 20 Mar 44, in Italy, a fire was started on a clump of trees near an M-10 tank destroyer, and telephone lines were broken between the tank destroyer platoon CP and the company CP, by an exploding shell. He voluntarily left his dugout and proceeded about 300 yards over an area that was being shelled by enemy artillery to the company CP and reported the fire and the broken lines. Address: St. George Ave., Avenel, N. J.

T/5 EDWARD L. GODSY, for maintaining vital communication lines during an attack on the enemy at Bougainville, 25 Jan 44, in the face of heavy enemy mortar and small arms fire. Address: 312 SE 16th St., Oklahoma City, Okla.

LT. COL. HARRY F. GOSLEE, for exceptionally meritorious service in England from 20 Oct 43 to 31 May 44 as headquarters commandant, Headquarters First U. S. Army, in connection with operations against the enemy. Address: 1034 North W Block, Columbus, Ohio.

SGT. JAMES R. GRAHAM, for laying a telephone line from the artillery CP to the liaison officer located at the infantry battalion CP, when his organization in Italy was attacking strongly defended enemy positions, 21 and 22 Jan 44. Constantly exposed to intense enemy artillery, mortar, and machine gun fire, he courageously evacuated several severely wounded men in his jeep, driving them along shell-torn roads to safety. Address: 3519 Hatcher St., Dallas, Tex.

CAPT. GEORGE P. GRIEVE, for completing a survey as intelligence officer of a field artillery battalion at Guadalcanal, from 1 to 31 Jan 43. From 15 Aug to 15 Sep 43, on Vella LaVella Island, he served as a battery commander and was part of the initial echelon of artillery to go ashore. Despite the many difficulties encountered, positions were soon established and the battery was registered and prepared to support the infantry the night before the attack was to be made. Address: 117 E. Ninth St., Ames, Iowa.

S/SGT. HAROLD L. HAMILTON, for assistance in performing the hazardous task of laying and repairing communication lines, during severe enemy artillery barrages near St. Ella, Italy, on 13 Feb 44. Address: RFD 1, Laurelhill, Fla.

SGT. ROBERT S. HARSHBERGER, for performing courageous and efficient duties by laying lines through fire-swept areas and adjusting deadly fire upon the enemy forces in New Georgia on 5 Aug 43. When a strong patrol of the enemy attempted to ambush his party, he coolly opened fire with his sub-machine gun and kept the enemy pinned down until his comrades had withdrawn safely. Address: 903 S. Senate St., Alliance, Ohio.

1ST LT. CARLOS K. HAYDEN, for going forward beyond the front line troops to a point approximately 1,000 yards short of the target to adjust artillery fire in Tunisia in 1943. With no knowledge whatever of what enemy forces lay directly in front of him, he completely disregarded his own welfare by voluntarily proceeding into the forward area. Address: 91 Wing St., Newark, Ohio.

CPL. DALE W. HILTON, for remaining at a fordward OP on the front lines at Bougainville for a period of 40 hours under enemy fire, about 10 Mar 44. During this period he killed two of the enemy and was forced to withdraw after the roof of his dugout was blown off by hand grenades. Address: Mena, Ark.

1ST LT. CLAY W. HIX, for performing his duties as forward observer in an exceptionally able manner, exercising judgment and initiative far beyond the demands of competence, in Italy from 28 Oct 43 to 13 Feb 44. His foresight in charting adjusting data for all sections of a large enemy stronghold near Mt. Patano enabled

him to call down immediate, precise fire on several enemy counterattacks. Address: RFD 1, Shelbyville, Tenn.

CAPT. FRANK C. HOBBS, for the delivery of important instructions to a task force operating in the right zone of advance of his division during crucial stages of an operation against the Germans in Italy on 12 May 44. He took a dangerous route through enemyheld territory in preference to a safer but longer and more time-consuming route in order to effect delivery of the orders at the earliest practical moment. Address: 1809 41st Ave., N. Seattle, Wash.

CPL. CLIFTON B. HUFF, for repairing vitally needed communication lines between the division FDC and two artillery battalions despite enemy sniper fire, at Guadalcanal, on 11 Jan 43. Again on 14 Jan 43, with sniper bullets hitting perilously close to him, he repaired important wire lines. Address: RFD 2, McDade, Tex.

1ST LT. WILLIAM L. HUTCHINSON, for effecting the laying of wire lines cross-country through jungle and swamps and over mountainous terrain in the Solomon Islands, from 15 Aug to 15 Sep 43. All wire was laid by hand, the 85-pound reels of wire being carried over almost impassable terrain. Address: 832 Indiana Ave., Monaca, Pa.

T/4 CHARLES L. JENKINS, for maintaining wire communications while in action against the Japanese forces at Vella LaVella, from 15 Aug to 15 Sep 43. All wire lines were exceptionally long and over almost impassable jungle terrain of swamps, steep hills, and sharp ravines, and in addition were laid in many instances outside the perimeter defense, subjecting the section to the added danger of enemy sniper fire. Address: RFD 2, Edinburg, Va.

CPL. ROBERT T. JOHNSON, for exceptional devotion to duty as a linesman and telephone operator during the advance on Munda Airfield, at New Guinea, Solomon Islands, from 2 Jul to 5 Aug 43. In the liaison capacity between a field artillery battalion and an infantry regiment, he surmounted all obstacles in the maintenance of communications which were often the only link between the division's forward and rear elements. Address: 2245 Twelfth St., Akron, Ohio.

CPL. LEO M. KALINOWSKI, for day and night repairing of broken communications in areas where hostile shells were bursting at Bougainville, from 8 to 24 Mar 44. Address: 27 Krych St., Kingston, Pa.

SGT. ANDREW A. KALTZ, for organizing and leading his section in unloading the howitzer and all sectional equipment from a landing barge into a hazardous coral beach, in the face of enemy air power and light and rough surf on New Georgia, in 1943, while serving as chief of a medium howitzer section. Address: 3891 Maplelane Road, Warren, Mich.

1ST LT. WILLIAM KASHNER, for contributing materially to the accuracy of his battalion's fire, under the most difficult conditions and under effective enemy fire, while a survey officer of a battalion at New Georgia and Bougainville from 4 Jul through 13 Sep 43. Address: 118 E. Oak St., W. Lafayette, Ind.

T/5 JOHN KASINIAK, for remaining at his post and calmly and efficiently directing traffic moving through a danger area near St. Ella, Italy, 12 Feb 44. While he directed traffic the area was shelled by the enemy and powder charges near his position were set afire, illuminating the release point. Address: 6639 Racine St., Chicago, Ill.

T/4 KENNETH K. KELLER, for maintaining telephone lines and radio communications between an OP and a battery under adverse conditions, which included hostile fire by the Japanese, at Guadalcanal, from 10 to 16 Jan 43. Address: Beaver, Okla.

PFC JOHN V. KERR, for repairing on his own initiative broken communication lines in action against the enemy at Bougainville, during a severe attack on 12 Mar 44. Address: 737 N. 26th St., Philadelphia, Pa.

CAPT. ROBERT G. KISSEL, for action in a FDC with an armored field artillery battalion in Italy on 19 Feb 44. After seeing that the wounded were cared for he set up an improvised table, made up a new fire chart, and in a short time had the fire direction board in operation. Less than an hour after a bombing raid he had moved to a new location, and computed and radioed to the firing batteries all the data necessary to lay down an important barrage for our infantry attack. Address: 4253 Leonard Ave., St. Bernard, Ohio.

SGT. NORMAN J. LAROSE, for crossing a hazardous stream to secure medical aid for a pilot who had been shot down and was suffering serious leg wounds, in the Russell Islands, Southwest Pacific, on 12 Jun 43. Unable to effect the rescue swiftly enough in a small boat, he directed a larger craft to a safe landing so that the injured man could be evacuated. Address: 15 Mason St., Warwick-Neck, R. I.

1ST LT. EMERY A. LIMING, for voluntarily remaining with a small force of men and directing artillery fire on the enemy by radio, in heated action at Bougainville on 1 Apr 44. A patrol which had engaged in a fire fight with the enemy decided to withdraw and evacuate four wounded men. He lingered to the rear with a small force, thus preventing the enemy from following the evacuating party and inflicting further casualties. Address: 701 Fillmore St., Caldwell, Idaho.

1ST LT. GEORGE F. MACKLIN, for performing his many administrative duties in a superior manner and displaying outstanding coolness under fire, throughout the Tunisian Campaign in North Africa from 22 Dec 42 to 9 May 43. He always made sure that his men had cover before seeking protection for himself. As postal officer, he handled a large volume of mail so efficiently that prompt delivery was assured, despite extremely adverse conditions. Address: RFD 1, Laurelville, Ohio.

PVT. JOSEPH MAKOWSKI, for destroying an enemy machine gun emplacement while proceeding to the rear with enemy prisoners and two of his comrades in Italy on 12 May 44. When they encountered the enemy machine gun position within five feet of their route, he seized the initiative and they destroyed the emplacement. Address: 375 E. Main St., Bridgeport, Conn.

PVT. WESTON R. MATTHEWS, while under enemy mortar fire which was directed on the area of Mass Capaldi, Italy, 12 Jan 44, he maintained wire communications from an advance OP to gun positions. The communication line was repeatedly destroyed by enemy mortar fire, and he made six hazardous trips to repair breaks and reestablish contact. Address: RFD 2, Bessemer, Ala.

CPL. JOHNNY W. McCALL, for voluntarily exposing himself to enemy observation in the vicinity of Mount Natale, Italy, on repeated occasions from 14 to 15 Apr 44. He repaired broken wire lines between the battalion forward OP and the FDC. Although enemy artillery and mortar fire fell all about him and in spite of the fact that he had been instructed not to expose himself by servicing the lines during daylight, he persisted in working on the lines at the risk of his life. Address: Box 548, Brentwood, Cal.

LT. COL. WILLIAM B. McCORMICK, for conscientiously effecting the rescue and evacuation of many men when the *S.S. President Coolidge* was sunk in the Pacific Ocean in Oct 42. He sent his battalion to the decks and over the side and was responsible for saving many lives. Address: 24 Everett Ave., Providence, R. I.

CAPT. THOMAS H. McDOWELL, for playing a responsbile part in the efficient leading and moving of the battalion to Vella LaVella, from 15 Aug to 15 Sep 43. After arrival of the battalion on the island he was charged with the task of building roads through almost impassable jungles; under his active leadership the roads were completed with a minimum of delay. During this period his ability at improvising spare parts kept the battalion's vehicles in running order at all times and enabled the widely separated batteries to be supplied. Address: 419 W. Ninth St., Bonham, Tex.

PFC SAMUEL J. MOORE, for assistance in extinguishing flames of a camouflage net and gun cover during action in Italy on 16 Apr 44. Address: Box 128, Electra, Tex.

CAPT. HAROLD H. NEFF, for exposing himself to enemy fire to deliver accurate concentrations on enemy areas while in support of infantry action at Bougainville, from 29 Mar to 3 Apr 44. Address: Pinecastle, Fla.

1ST LT. JAMES C. OWENS, for advancing under enemy fire to an exposed position to adjust artillery fire on the enemy positions at Bougainville on 26 Jan 44, while on a patrol into hostile territory. Address: 125 E. Second St., Erie, Pa.

PVT. LOUIS G. PAREES, for maintaining communication lines within our perimeter at Bougainville, from 8 to 24 Mar 44. When artillery shelling knocked out and damaged several communication lines, he distinguished himself by going out at all hours of the day and night, under the most adverse conditions of danger and blackout, to restore and maintain uninterrupted telephone communications. Address: 159 Robinson St., Pittsburgh, Pa.

PVT. JACK W. POWELL, for laying and maintaining wire communication up to the farthermost point of advance under heavy enemy mortar and small arms fire and at the risk of his life at Bougainville, on 25 Jan 44. Address: RFD 1, Box 1120, Kent, Wash.

CPL. EUGENE C. PUCCINI, for executing repairs on communications wire during a heavy shelling by the enemy near Cerasuolo, Italy, on 26 Jan 44. Although shells were falling along the route of the line he immediately started out to repair the wire, tenaciously remaining at his task until communication was reestablished. The line was broken three times by enemy shells and each time he repeated this difficult and dangerous repair mission. Address: 16 Ballou Ave., Dorchester, Mass.

LT. COL. JAMES B. RANKIN, for displaying unusual skill in the employment of his battalion in positions as close to the most forward infantry elements as was possible, in Italy from 11 to 28 May 44. Address: Yuma, Ariz.

1ST LT. ROBERT J. REED, for performing in an outstanding manner the duties of observer while in action against the Japanese forces at Guadalcanal on 13 Jan 43. For five days he rigorously carried on his duties as forward observer. Address: 2309 Dawndale Ave., Rockford, Ill.

CAPT. JAMES I. REID, for rushing through heavy artillery fire to the wreckage of a struck building housing the battery kitchen and directing the removal of wounded comrades, in the vicinity of Mt. Trocchio, Italy, during an intense enemy concentration on 24 Apr 44. He then hurried to other battery installations and returned with additional help to aid in the removal of casualties from the building. Still under shelling, he established order and organized his men into efficient rescue squads. Address: 5749 Saloma Ave., St. Louis, Mo.

SGT. JOHN F. RITTNER, for action in direct support of combat operations from 10 Jul to 17 Aug 43, during the Sicilian Campaign. Without supervision, he overcame difficulties of terrain and distance in maintaining a constant flow of ammunition. Address: RFD 1, Box 48, Germantown, Wis.

SGT. LLOYD H. ROBERSON, for rendering aid to wounded comrades during enemy shelling in Italy on 7 Jan 44. Address: RFD 1, Waltonville, Ill.

S/SGT. SIGFIELD A. RONN, for acting as assistant of his battery in the Southwest Pacific from 30 Jun to 21 Sep 43. Accepting the duties and responsibility of a position ordinarily occupied by a commissioned officer, he performed in an exceptionally meritorious manner which brought forth high praises from many who witnessed his conduct. Address: 153 Bishop Ave., Rumford, R. I.

T/5 VINCENT J. SCALEA, for meritorious services in support of combat operations in Italy between 3 Nov 43 and 8 Dec 43. Address: 2340 S. Chadwick St., Philadelphia, Pa.

PVT. JOHN R. SCHOLL, in his capacity as wireman, during the New Georgia Campaign from 4 Jul to 13 Sep 43, rendered outstanding service to his battalion. Address: 815 W. Third St., Madison, Ind.

PFC ROBERT P. SHERRY, for action during heavy enemy artillery concentration near Cervaro, Italy, 18 Apr 44. The executive post in the battery area received a direct hit which seriously injured an officer. While the shelling continued, Pvt. Sherry left his place of cover, ran to the executive post, aided in removing the wounded officer from the slit trench in which he had been partially buried, and administered first aid until the arrival of the battery aid man. Address: 143-31 Roosevelt Ave., Flushing, N. Y.

CAPT. HOLLIE W. SHUPE, for acting as forward observer for a unit at Guadalcanal from 12 Nov 42 through 9 Feb 43. On many occasions he placed himself in front of the infantry lines and while under enemy machine gun, mortar, and sniper fire made precision adjustments on enemy gun emplacements. Address: 604 Midgard Rd., Columbus, Ohio.

T/5 BURT E. SILVERTHORN, for leaving the protection of his cover and assisting in the treatment and evacuation of the wounded during an assault on Munda Airfield while with a forward party on the night of 3 Aug 43. During the assault by enemy forces from 8 to 13 Mar 44 at Bougainville, he performed outstanding service in maintaining communications for his artillery forward observer and in regularly serving duty in a tree OP—hazardous position—on a small platform 100 feet above the ground and exposed to enemy observation and fire. Address: 9603 Harvard Ave., Cleveland, Ohio.

1ST LT. JAMES A SMITH, for exhibiting initiative, meticulous, care and high degree of professional skill in the performance of his duties from 25 Oct 43 to 8 Feb 44 as a forward observer along the Italian front. Address: 567 Grand Ave., Cincinnati, Ohio.

CAPT. GEORGE A. THOMPSON, for outstanding service as communications officer for his battalion during sustained operations, most of which took place in mountainous terrain and in extreme weather conditions of snow, rain, and cold from 1 Oct 43 to Mar 44, in Italy. Address: 17 E. Market St., York, Pa.

PVT. JAMES A. THORN, for calm, quick action which saved many lives and valuable equipment while on a patrol into enemy territory at Bougainville, from 21 to 25 Feb 44. When his patrol was hit by knee mortar and rifle fire, he immediately deployed to protect the radio, the only means of communication with our main force, and assisted the infantry in returning the enemy fire. Address: RFD 2, Massillon, Ohio.

CAPT. NED P. VEATCH, for taking charge as plans and training officer and reorganizing the FDC during an enemy bombing attack near Padiglione, Italy, on 19 Feb 44. Under his supervision the battalion laid down an important barrage. Address: 10406 Eberhart Ave., Chicago, Ill.

1ST LT. FREDERICK C. VEEVERS, for working tirelessly under the most disagreeable weather conditions to maintain communications and help lay 72 miles of wire of the battalion in Italy from 21 to 27 Nov 43. Address: 66 Essex Ave., Glen Ridge, N. J.

S/SGT. Manuel P. VIVEIROS, for outstanding action while in charge of a detail unloading an LST at night at Vella LaVella on 21 Aug 43. He, by his leadership, kept the detail aboard the vessel and continued unloading the ship during a continuous dive bombing attack until the order was given to vacate the ship so that it could be put out to sea. Address: 1140 South Broadway, East Providence, R. I.

CPL. LESTER W. WHITLEY, for aiding in the performance of the hazardous task of laying and repairing communication lines during severe enemy artillery barrages near St. Elia, Italy, on 13, 14 Feb 44. Address: RFD 1, Spruce Pine, Ala.

T/4 FRANKLIN M. WILDS, for leaving his foxhole and driving a ¾-ton truck a safe distance from a fire started by enemy shelling near Aquafondata, Italy, on 1 Apr 44. A second gasoline dump 75 yards away was set afire and exploded violently. He rushed to this fire and despite grave danger removed a burning tarpaulin from another truck and drove the vehicle away from the fire. Address: Ellis Ave., Newtown Square, Pa.

CPL. GEORGE D. WOLF, for outstanding action while engaged as wire corporal of a battalion in the Southwest Pacific Area on 1 Jul 43. Address: 43 High St., Dayton, Ohio.

LT. COL. CHESTER W. WOLFE, for demonstrating outstanding ability and leadership in directing fire at New Georgia, from 19 Jul to 6 Aug 43. He solved formidable problems of communication and liaison, his batteries achieving an amazing record of accurately delivered barrages. Address: 121 North Ridge Road, Columbus, Ohio.

CPL. HARLAN L. WOODS, for occupying vital observation posts on or in due proximity to the front lines while in direct support of combat operations at Guadalcanal from 5 Jan to 9 Feb 43. While exposed to enemy fire, he continued to observe and report valuable information which contributed to the success of the combat mission. Address: 1211 Salem St., Malden, Mass.

PFC JOHN J. ZAMLEN, for remaining at his post for two days and a night while under heavy enemy fire at Bougainville on 10 Mar 44. Although wounded, he continued to direct fire on the enemy until he was relieved. Address: 344 E. Schiller St., Milwaukee, Wis.

CPL. EUGENE J. ZIAJA, for voluntarily accompanying a patrol which reconnoitered deep into dangerous enemy territory at Bougainville, 21 to 23 Mar 44. During several actions, he remained calm and continued to make notes to complete firing data for our artillery units to knock out hostile field pieces. Address: 2551 N. 43d St., Fairmont City, Ill.

1ST LT. ELWOOD W. ZIEGLER, for outstanding action while conducting fire from a battery OP near San Fratello, Sicily, on 3 Aug 43. While adjusting fire on an enemy pillbox and machine gun nest, his OP was subjected to a precision adjustment. Approximately 30 rounds of 105-mm fire landed in the immediate vicinity of his post and several rounds landed within two yards of his position. He was protected on three sides by rocks, but had no overhead cover.

During the 45-minute period he was under this fire he continued with his own fire missions, necessarily exposing himself to do so. Address: Leetonia, Ohio.

S/SGT. CLEVELAND DUPUIS, Atchafalaya, La.

1ST LT. MAX L. KURLANSKY, 28 Taft Ave., Bridgeport, Conn.

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T/4 MERRITT W. PIERSON, Box 902, Norfold, Nebraska.

SGT. HARRY B. SCRIBER, Star Route, S. Winnsboro, Nebraska.

For meritorious achievement in connection with military operations against the enemy at Bougainville, Solomon Islands, from 8 Mar 44 to 3 Apr 44.

PFC. PAUL M. KLINGER, 2027 S. E. 14th St., Portland, Ore.

SGT. ROMAN A. LATOWSKI, 5003 W. 29th St., Cicero, Ill.

1ST LT. FRANK V. MONROE, Claremore, Okla.

PFC. JOHN T. PARSON, 3502 S. Seventh St., Tacoma, Wash.

For speed and ability in performing duty while in direct support of infantry elements contributing greatly to the rapid registration of fire missions in New Guinea on 17 May 44.

T/4 FRANK R. ESSLINGER, 140 Mahar Ave., Clifton, N. J.

PVT. WILLIAM KRAUSS, 87 Park St., Montclair, N. J.

PVT. FLOYD L. McCORMICK, Box 933, Sweetwater, Texas.

CPL. KENNETH L. PATE, Box 132, Marion, Ill.

For meritorious achievement in connection with military operations against the enemy at Bougainville, Solomon Islands, on 10 Mar 44.

CPL. ROBERT L. ROBERTS, for meritorious achievements in connection with military operations against the enemy at Guadalcanal from 12 Nov 42 to 9 Feb 43 and at Bougainville from 8 Mar 44 to 24 Mar 44. Home address: 583 W. Pershing St., Salem, Ohio.

T/5 CLAIR R. WINTCH, for unfailing attention to duty and outstanding efficiency at Goodenough Island, SW Pacific Area, from 7 Mar 44 to 17 Apr 44. Home address: 341 S. 9th E., Salt Lake City, Utah.

PVT. JACK C. CHASTAIN, RFD 3, Stroud, Okla.

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Ten men in the Americal Division, who helped in the mopping up and in the defense of Guadalcanal after the first Marine invaders pushed back the Japanese, were awarded the Presidential Citation Bar with one star. The men demonstrated outstanding gallantry and determination from 7 Aug 42 to 9 Aug 42 in successfully executing forced landing assaults against a number of strongly defended Japanese positions on Tulagi, Gavutu, Tanambogo, Florida and Guadalcanal, completely routing the enemy forces and seizing a most valuable base and airfield within the enemy zones.

BOOK REVIEWS

STILL TIME TO DIE. By Jack Belden. 322 pages. Harper & Bros. $3.00.

Jack Belden is singularly qualified for his task of interpreting war. His study of war began early in life and has continued through the years with a sort of fascinated intensity.

His analysis of the hideous character of war does violence to any illusion of glory on the battlefield. With reckless bitterness he sweeps aside the fables and falsehoods that have been woven into popular concepts of war. Defiantly he strips it of its old protective myths and shows it as a condition that brings into open expression the basest, crudest elements of human nature.

In separate parts the author gives disturbingly realistic descriptions of Chinese battlefields, British battlefields, and American battlefields. His descriptions of civilian suffering are unsparing in their revolting detail. Especially in accounts of the retreat from Hsuchow and the siege of Malta he conveys a sickening sense of the desolation and horror on the home front. Through it all there runs the same thread of individual helplessness against the age-old force that is born out of political intrigues and savage nationalism.

With an effective sprinkling of pertinent quotations from the Prussian general von Clausewitz, and its title from the same source, this book is still curiously subjective in its approach, though at no cost to its hard realism.

In conclusion the author expresses his ideal of a world democracy, but no hope of its early postwar realization. He has seen the processes of world polities negatively expressed and, whatever the errors in his judgment, unwarranted optimism does not appear in his printed pages. F. E. J.

COMPASS OF THE WORLD. Edited by Hans W. Weigert and Vilhjalmut Stefansson. 460 pp.; index; illustrated. The Macmillan Co. $3.50.

Events—particularly the rise of aviation—have completely changed the impact of geography on our political and economic life. We are aware of that fact but out thinking rarely gets beyond an acknowledgment of the generality. Here is an attempt to focus our attention on a few of the most important aspects of the subject which will probably most vitally affect us as we move into the long-hailed "world of tomorrow."

The book is composed of 28 thoughtful and informative articles by such learned authorities—to mention a few—as Halford J. Mackinder, Isaiah Bowman, Quincy Wright, Edmund A. Walsh. The editors of the book—an acknowledged student of political science and a noted Arctic explorer and author—did not confine their scope to any one phase of political geography. The subjects can best be illustrated by giving the subdivisions of the contents: "The New World: Geography and Geopolitics," "New Directions and Skyways," "Reflections on the Heartland," "The Northward Course," "Reflections on Asia" and "The Shifting Balance of Man Power." Here is the proverbial gold-mine for a reader seeking a solid basis for his vision of the future.

It is perhaps a defect of the symposium-type of book that all of the articles do not fall into a neat, orderly pattern. In my opinion, however, the resulting loose-ends—for example, the disagreements—open up vistas of thought far more than when our minds are being subconsciously guided along a single track by one author. The textbook flavor makes some of the articles rather hard to read but does not lessen their value. Others are studded with personal opinion and conjecture (the editors to the contrary notwithstanding) and the reader must always be on his guard.

Perhaps due to war-time shortages the maps (drawn by Richard Harrison) are often reproduced too small to be other than an eyestrain. As a whole, however, the book is an excellent source of information. J. R. C.

BLESSED ARE THE MEEK. By Zofia Kossak, 375 pp. Roy Publishers. $3.00.

Tumultuous events of the early Middle Ages are dramatically interwoven with the story of the life of St. Francis of Assisi, in *Blessed Are The Meek*, translated from Zofia Kossak's native Polish by Rulka Langer. This is an historical novel in the grand tradition written with color, verve, and dramatism.

The gentle Francis, beloved by his small band of followers and scoffed at by nobles and ecclesiastics, wins approval from Pope Innocent III for his Rule for the Order of the Brothers Minor. Francis accompanies Jean de Brienne and Cardinal Pelagius on their Crusade to Jerusalem to regain the Holy Land from the infidels. Where the Crusaders fail, Francis triumphs by his utter simplicity, sincerity, and love, and persuades the Sultan to spare the invaders. Interwoven with the story of Francis is the tragic tale of the Children's Crusade; the passionate love of Count de Brienne and the dynamic Blanche of Champagne; and fascinating tales of the wild forebodings predicted by the heavens.

Miss Kossak presents Francis as a figure not detached from his time but vital to it. To this reader, however, she overpainted the quality of simplicity in Francis, making him more of a simpleton than a simple fellow. C. P.

THE PAGEANT OF CHINESE HISTORY. By Elizabeth Seeger. 389 pp.; index; illustrated. Longmans, Green & Co. $3.00.

As the tempo quickens in the Asiatic Theater it becomes steadily more apparent that more and more Americans will shortly become intimately connected with China and her people. Like us, the Chinese are essentially peace-loving. Their background and ways of life are very, very different, however. In a superficial sort of way we know something of present-day life in China, but we're woefully ignorant of China's history, of what elements helped make her and her people what they are today.

That is where Miss Seeger's *Pageant* fits in. It has an unusual but most logical balance. Most of it deals with the "earlier" years rather than with "modern" history. This is well, since the great

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dynasties of the past exert such a strong influence even now. For orientation concerning the least-known of the "Big Four" this is an admirable volume.

PRELUDE TO INVASION. 332 pp.; photographs. Public Affairs Press, $3.25.

Since the war's early days the Secretary of War has issued progress reports almost weekly. Expressed in direct language, these have been neglected much more than they deserved. A distinct service was performed in recording them permanently in book form. This volume ends with the report of 8 Jun 44, just after our Normandy invasion. We hope another will follow later, concluding the full story of our participation.

GERMANY: A Short History. By George N. Shuster and Arnold Bergstraesser. 228 pp.; index; maps. W. W. Norton & Co. $2.75.

From the days of the Germanic tribes on down through the centuries, what is now Germany has had a stormy history. Perhaps because of this she at times has developed great liberals—but they have usually emigrated from the homeland, to the benefit of their new ones. This short history is largely devoted to the 18th century and substantially ends with Hitler's accession to power. It is thus unusually useful at this time, either as a refresher or for gaining a perspective of the German people.

THE ART OF WAR. By Sun Tzu; translated by Lionel Giles; introduced and annotated by Brig. Gen. Thomas R. Philips. 99 pp. Military Service Publishing Co. $1.00.

Military Service's "military classics" series gains a notable addition from this oldest military treatise of the world. Highly compressed, it deals solely with fundamental essentials. Sun Tzu's principles—including recognition of the influence of human nature and politics on military operations—are as applicable today as when written some 2,400 years ago.

GLOBAL EPIDEMIOLOGY; Vol. 1: India, the Far East, and the Pacific Area. By James Stevens Simmons, Tom F. Whayne, Gaylord West Anderson, Harold Maclachlan Horack, and collaborators. 468 pp.; index; maps. J. B. Lippincott Co. $7.00.

Global Epidemiology is a clever, practical, intelligent compilation of essential data of inestimable value to any student interested in health and sanitary conditions existing in Southeast Asia and adjacent islands. It is a valuable book for any physician anticipating post war medicine. Every doctor will find it most convenient in treating our men "six months after" and after that. C. H. A.

WHEN JOHNNY COMES MARCHING HOME. By Dixon Wecter. 558 pages; index. Houghton Mifflin Co. $3.00.

This Life-in-America prize book is a record of how our soldiers after the Revolution, the Civil War, and the First World War recrossed the bridge from war to peace. The soldiers largely speak for themselves through many interesting letters and diaries; but the skilled hand of the scholarly author, Dixon Wecter, is always present as he analyzes and comments in a very readable manner.

Dixon Wecter, a well-known writer and professor in the field of American social history, has assembled in the pages of *When Johnny Comes Marching Home* a significant record of the experiences, the attitudes, the thoughts, the feelings of American boys home from earlier fronts. In addition to being delightful American history, this book will help today's social planners, employers, fathers, mothers, and sweethearts understand better the twelve million American boys who are coming home from this war. F. B.

BEST CARTOONS OF THE YEAR 1944. Edited by Lawrence Lariar. 128 pp. Crown Publishers. $2.00.

Selections from *Collier's, The New Yorker*, etc., etc.,—the cream of the crop, both of magazines and cartoons—were picked by the cartoonists themselves. The result is a swell book with which to pass any leisure time you might have.

THE SAD SACK: His Biography in 115 Cartoons from "Yank." By Sgt. George Baker. Simon & Schuster. $2.00.

No army character is better known than the Sad Sack. None is more wistful, either—nor does any get the dirty end of the stick any oftener. Each week brings him more woes. A batch of the best has been brought together in the best cartoon book in ages.

THE BULL OF THE WOODS. 125 cartoons by J. R. Williams. Charles Scribner's Sons. $1.25.

Jim Williams is just about *the* master of the single-panel cartoon. For over 20 years his "Out Our Way," "Why Mothers Get Gray," "Born Thirty Years Too Soon," and "Worry Wart" series have been at the top of the heap. Equally human and humorous is his machineshop "Bull of the Woods" series. These drawings are so pat, so uncannily shrewd in their portrayal of human nature, that just about everyone gets a real chuckle from every one of them.

PETER ARNO'S "MAN IN THE SHOWER." Simon & Schuster. $2.50.

For the first time since 1941 Peter Arno has published one of his grand books of cartoons. At this season various publishers blossom forth with such volumes, but none this reviewer has seen in a long time has caused so many plain belly-laughs as this one. There are 115 examples of Arno's inimitable handiwork, and a number have never before appeared in print. This is one swell book for dayroom, or to give to a (preferably masculine) friend.

HANNIBAL'S ELEPHANTS. By Alfred Powers. 272 pp.; illustrated. Longmans, Green & Co. $2.25.

Tanks are not a new concept, of course. Hannibal was one of the ancients who used them—in the form of elephants.

Mr. Powers has written a historical novel based on Hannibal's invasion of Italy. Told from the point of view of the young assistant to the keeper of the elephants, it is a "natural" for a gift (Christmas, birthday, or otherwise) to any boy.

THE RAFT BOOK. By Harold Gatty, 152 pp.; illustrated; separate map, charts, scales. George Grady Press, Inc. Regular edition, $3.25; concentrated, waterproofed edition, $2.00.

Wiley Post's navigator on his famed round-the-world flight has worked out an astoundingly simple and accurate way for anyone to find his way to land, wherever he might be set adrift. All he needs is this book and its accompanying charts, and a watch; no instruments, other charts, or previous navigating experience are required.

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The regular edition is for use ashore and on ship for familiarizing oneself wtih the methods. The waterproofed edition is more compact, uses smaller type, and omits a few of the color plates and some of the background material not essential for actual use; with waterproofed chart and tape, this smaller 64-page book is enclosed in a waterproof envelope to form a truly useful package.

The Raft Book contains much of interest to military and naval personnel, seamen, fishermen, and yachtsmen, as well as armchair voyagers.

EUROPE: An Atlas of Human Geography. By Marthe Rajchman. 118 pp.; index; illustrated. Wm. Morrow & Co. $2.00.

With maps, charts, graphs, diagrams, ingenious and effective combinations of them, and some clear text, Miss Rajchman presents a tremendous amount of information about Europe's background. She points up Europe's basic problems and sheds light on many of those of tomorrow.

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OUR ARMY AT WAR: Photographic History of American Campaigns in World War II. 280 pp.; illustrated. Harper & Bros. $3.00.

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Only a few technical inaccuracies have crept into the captions—30-mm for 30-cal., 155-mm gun for 105-mm howitzer, shrapnel (a very definitely technical term) for shell fragments, and one or two others—but they are picayune when one considers how well the grand sweep of events has been treated. We eagerly look forward to future volumes completing this fine pictorial history.

THE MODERN HOYLE. By Albert H. Morehead. 308 pp.; illustrated. John C. Winston Co. $2.00.

Mr. Morehead knows his games: he's editor of card games for the New York *Times*, puzzle editor of *Redbook* and *Blue Book* magazines, and publisher of *Bridge World* magazine, and on top of that he's a champion player of contract bridge. He can write about them, too, in terse, clear descriptions of how they are played. From dominoes to chess, from euchre and casino through pinochle and cribbage to contract bridge, he describes the games, their rules, their theory and strategy. It's a fine book for opening up new pleasures for any "off" hours you may have.

SO LONG, SON. By Howard Vincent O'Brien. 31 pp. G. P. Putnam's Sons. 75c.

So Long, Son is the author's personal account of his experience as the fond father of a young man fighting in World War II.

This brief book is vivid in its simplicity. It cannot fail to arouse reader response, especially among other parents of young fighting men. The story is one that, in its essential points, is common to the experience of thousands of parents. There is the same poignant separation that so many others have known, long days of anxious waiting, and then the official message that "The Secretary of War regrets . . ."

The story is told with a comforting tenderness and a soothing quality of human understanding that fully justifies the author's expressed hope in agreeing to the publication of *So Long, Son*—the hope of helping other parents saddened by the toll of war. F. E. J.

ARTICLES OF WAR ANNOTATED. By Col. Lee S. Tillotson, U.S.A., Ret. 336 pp.; index. Military Service Publishing Co. $2.50.

Col. Tillotson's work has been the handbook for countless persons engaged in the administration of military justice. This third revised edition will be especially welcome, as its annotations include references to a great body of matter decided by The Judge Advocate General since the outbreak of this war. Specifically, 68 new pages summarize the applicable 1942 and 1943 Opinions of that officer, all being keyed to the appropriate Article of War and page in the main body of the book. Nowhere else can be found such an essential working tool for anyone connected with courts martial.

MILITARY LAW FOR THE COMPANY COMMANDER. By Julian J. Appleton. 117 pp.; index. National Law Book Co. $2.50.

Prepared strictly with the busy small-unit commander in mind, this latest addition to the literature of military law is a notable contribution. It recognizes the need for a direct-action book, phrased in layman's language, and written from the point of view of the battery officer rather than the TJA, etc. It appears to do this job well.

The author is a lawyer, now a warrant officer assistant to the Staff Judge Advocate at Camp Sibert.

WE STOOD ALONE. By Dorothy Adams. 284 pp.; photographs. Longmans, Green & Co. $3.00.

The aching wistfulness conveyed by the title of this book is sustained throughout the text. That is not to say that the story contains only sadness and tragedy. Indeed, the more personal narrative thread has a certain infectious gaiety at times. But it is the Polish background of defeated purpose that strikes and holds the note of sadness.

The author, an intelligent American woman, politically and socially

sensitive, sees in Poland much that has escaped more cursory observers. She has found beneath its unassuming surface a rare dignity and uprightness of purpose that surely deserve a better national fate than the country has experienced.

Against the background of the young writer's American training Poland is seen in a new, intensified light. Vigorously the author strives for a clear, first-hand understanding of the strange, fascinating country. Its courage and national doggedness astonish her and win her wholehearted devotion.

Her marriage into a prominent Polish family further identifies her interests with the destiny of the country. Her interpretation of what might be termed her country-in-laws takes on the intimate quality of observations grounded in personal experience.

We Stood Alone is an informative book, not only in an academic sense but in the broader, more significant one that it promotes a closer human understanding of a country that we have known too superficially. F. E. J.

THE AMERICAN RIFLE FOR HUNTING AND TARGET SHOOTING. By C. E. Hagie. 172 pp.; index; illustrated. The Macmillan Co. $1.95.

Dr. Hagie is a famed big-game hunter who knows his rifles. He found, however, that most soldiers are acquainted only with their service arms. They have learned to shoot and service these, though, and many have become interested in range or field shooting.

It is for this latter group—the potential sportsmen—that this book was written. Emphasis is on sporting rifles and ammunition rather than on target arms. Not only are the arms and ammunition described, but chapters are included on special problems of big-game shooting, care of game in the field, and other subjects of practical value. It's a good book.

RIFLES AND MACHINE GUNS. By Melvin M. Johnson, Jr., Capt. USMCR (Inactive). 384 pp.; index; illustrated. William Morrow & Co. $5.00.

Subtitled *A Modern Handbook of Infantry and Aircraft Arms*, this book is primarily an introductory study of modern military small arms for those who use, study, or maintain weapons in service. In no sense is it an advanced treatise—indeed, many large volumes would be needed for exhaustive treatment of the sixty-odd weapons dealt with here. Its balance between the general and the detailed makes it ideal for the average interested military man. Ample operational descriptions facilitate familiarity with weapons of many nations, without cluttering the text or illustrations with material of peculiar interest only to the advanced gunsmith.

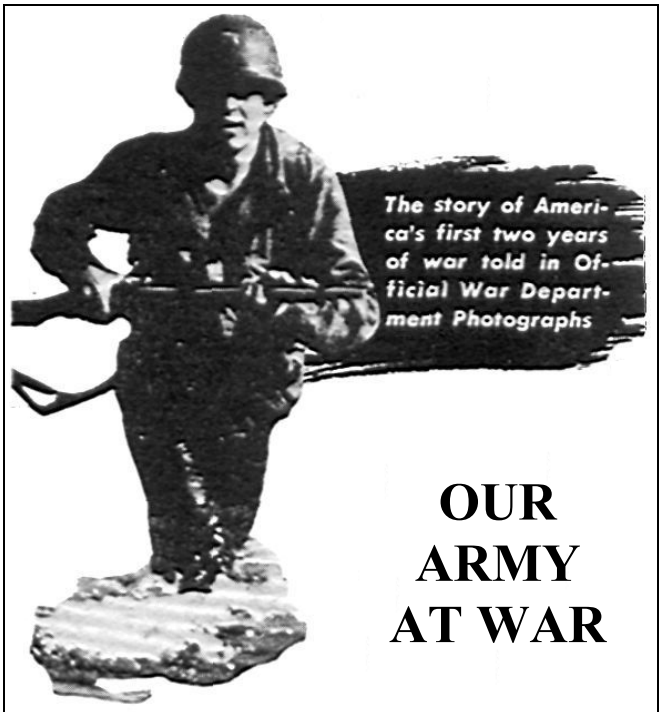
Over 225 pages are devoted to military small arms in use today, with chapters on rifles and semiautomatic rifles, automatic or machine rifles and light machine guns, submachine weapons, and anti-vehicle weapons. Among the specific guns described (and pictured by photos and drawings) are the important ones of our own army, as well as of Japan, Russia, Germany, England, and others.

Well up to Capt. Johnson's usual standard, *Rifles and Machine Guns* admirably fills some of the gaps in current literature on small arms. It is a splendid complement to *Automatic Arms* and *Ammunition*, both of which have previously been reviewed in these pages. Together, these three volumes cover the current situation very well.

STEAMBOATS COME TRUE. By James Thomas Flexner. 378 pp.; appendices; index; illustrated. The Viking Press, $3.50.

Like railroads, steamboats get into one's blood. The more one knows about them, the more curious he becomes about their beginnings. That's the way it was with Mr. Flexner, as a result of his abiding interest in neglected aspects and phases of American history.

History books tell us that Robert Fulton invented the steamboat, that his *Clermont* was the first successful steamer. Things weren't that simple, though. Of course it makes little difference that Fulton never called his boat by that now-well-known name. What *is* important is that all the essential elements of a steamboat had been perfected years before Fulton's rise to fame. Not only that, but in 1790 a better-performing boat operated on regular schedules for thousands of miles, between Philadelpia and Trenton! Dreamers and promoters, politicians and handy-men—all had a hand in the development. And of them all, Fulton was just about the least interested: to him the steamboat was just something by which to make some money to finance his more important project, the submarine.



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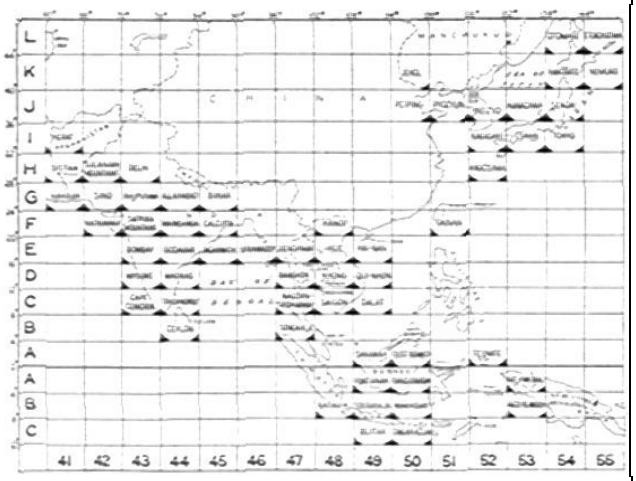

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Mr. Flexner is more interested in personalities than in mechanics. He consequently has written a fascinating account packed with personal histories. Prominent is John Fitch, the genius of many varied talents. So too is Voight, his helper. Fulton, the brilliant schemer, is here—along with Rumsey, the backwoods tavern-keeper who was playing for political favor. The interlocked lives of these men are viewed as a race for success. Mechanical and other developments of each are recounted. But not until the last page does the author award any palm, decide the winner.

FUSS 'N' FEATHERS. By Laura Long. 227 pp.; bibliography. Longmans, Green & Co. $2.25.

Military history can be approached from many angles. One of the most important is through the lives of great leaders. And one of America's great ones was Winfield T. Scott, "Old Fuss 'n' Feathers."

Scott's life covered the span from the end of the Revolution to the Civil War. He served in the War of 1812, the Indian Wars, and the Mexican War as well as in innumerable skirmishes and battles with his generals and with politicians. His was a strong personality, full of impatience and tactlessness. But he was a military genius, with an unbounded love for his country. These characteristics saved him time and again from the troubles and enemies caused by his speaking his mind.

Not an exhaustive biography, *Fuss 'n' Feathers* is a wholly readable account of Scott's life, which should be generally better known.

R.O.T.C. MANUAL: 3d and 4th Years. (*9th Ed.*) *999 pp.; illustrated. Military Service Publishing Co. In paper, $2.25; in cloth, $2.50.*

Designed for use in essentially military schools, this volume has been revised to include the latest official changes. Weapons and tactics emphasis is of course infantry. Other subjects well covered include military law, military history and policy, administration, organization, leadership, and field fortifications. Your 'teen-age brother can get a lot out of this book.

FREEDOM SPEAKS: Ideals of Democracy in Poetry and Prose. 245 pp. Infantry Journal. 25c (*to members of armed forces only*).

FRENCH DICTIONARY FOR THE SOLDIER. By Frank Henius. 199 pp. Infantry Journal. 50c.

SPANISH DICTIONARY FOR THE SOLDIER. By Frank Henius. 199 pp. Infantry Journal. 50c.

INFANTRY ATTACKS. By Field Marshal Erwin Rommel. 265 pp. Infantry Journal. $3.00.

The College English Association sponsored extracts ranging from the Psalms to Archibald MacLeisch.

Mr. Henius expands his list of pocket-sized, self-pronouncing dictionaries.

In 1937 the "Desert Fox" published this detailed account of his 1914-18 experiences with a Wurttemburg mountain infantry battalion.

THE SUPER-POWERS. By William T. R. Fox. 162 pp.; notes; index. Harcourt, Brace & Co. $2.00.

"Power politics" may not be the *motif* of the post-war period, but the fact remains that the United States, Great Britain, and Russia must work together in harmony if the world is to be stable. Mr. Fox analyzes the requirements for collaboration and the effects on smaller States, and suggests a path toward a world order of collective security.

SUMMARY OF OPERATIONS IN THE WORLD WAR:

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42nd DIVISION (*106 pp., index, maps; $1.50*)
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92nd DIVISION (*39 pp., index, maps; 75c*)
82nd DIVISION (*62 pages, index, maps; $1.00*)

Prepared by American Battle Monuments Commission; published by Government Printing Office.

This splendid series of operational summaries is rapidly being completed. Each volume includes an outline of the organization of the division and its service in the AEF prior to actual combat; a chapter on each campaign participated in; tables of strength, casualties, etc.; complete annotation to sources; and excellent maps of large size and scale, folded to fit into a pocket in the cover.

AS A CAVALRYMAN REMEMBERS. By George Brydges Rodney. 297 pp.; illustrated. The Caxton Printers, Ltd. $4.00.

The horse is still useful in the army, but the "good old days" of the horse outfits will never again be with us in the same old way. It is therefore especially delightful to find recorded these tales, anecdotes, and reminiscences of a way of living that has passed.

The author retired as a colonel of cavalry some years ago. His book starts with the Spanish-American War, continues with the Philippines, stops off for service in Hawaii, tells of days on the border, and ends with the last Armistice. Col. Rodney is a grand *raconteur*. His memories should delight both old servicemen and new.

COMBAT CORRESPONDENT. By Lt. Jim Lucas. 210 pp. Reynal & Hitchcock. $2.50.

Jim Lucas will ever be remembered for his reporting of Tarawa. It was a graphic, straightforward bit of writing that rightly won him the Headquarters prize for the best combat reporting of 1943.

He has roamed all over the Pacific, though, with gun in one hand and a typewriter in the other. Marine combat correspondents are in a unique position—they are not relative "outsiders" like the civilian war correspondents, yet they have a freedom of action far greater than that of the troops whose only job is fighting. Lucas has made the most of these opportunities. *Combat Correspondent* views the Pacific war from a new perspective. In a sense it is an inside story. In every sense it is fresh and detailed. In short, it's a swell book.

PACIFIC BATTLE LINE. By Foster Hailey. 405 pp.; photographs. The Macmillan Co. $3.50.

Foster Hailey has pounded the Pacific beat since the war's first days, as correspondent for the *New York Times*. His account of the first two years is unique. No one-shot, one-book, flash-in-the-pan reporter, he has written the first comprehensive account of naval development and developments that this reviewer has seen.

First the reader is oriented by a 34-page summary of what has gone on. This not only recalls great events that are blurring in memory against the pattern of newer actions, but also puts many of them in proper perspective. From this point Mr. Hailey goes into the details of the various phases (defensive, offensive-defensive, and offensive) and the Aleutian campaign. Unlike many correspondents' "who-dunnits," this book rounds out the picture by describing important events not actually witnessed by the author but with which he made it his business to become thoroughly acquainted.

Excellent as *Pacific Battle Line* is, it suffers from the general publisher's neglect of maps. Mr. Hailey's boss, the *Times*, has prepared and published some of this war's finest—but only a couple are reproduced, and they are squeezed down to practically nothing; they cover only a tiny fraction of the area involved, too. It is a pity that niggardliness or carelessness somewhere along the line has thus failed to make this the utterly top-notch book that it could have been. It's a fine one, though, even so.

THE VIKING PORT ABLE LIBRARY: HEMINGWAY. Edited by Malcolm Cowley. 642 pp. The Viking Press. $2.00.

Viking has done a fine service to soldiers and other travelers in publishing its "portable library." Each volume is compactly printed on thin paper, and of small enough size to slip easily into musette bag or even your pocket.

This latest of the series contains a complete novel (*The Sun Also Rises*); complete long passages from each of Hemingway's other novels; the complete book *In Our Time;* all the short stories that Hemingway has named as his own favorites; and the final chapter from *Death in the Afternoon.* All are of course by the single author, but a wide variety of his work is represented.

SLACKS AND CALLOUSES. By Constance Bowman; illustrated by Clara Marie Allen. 175 pp. Longmans, Green & Co. $2.00.

When two schoolmarms, one a writer and the other an illustrator, decide to spend their summer holidays building bombers, a book telling all about it was inevitable. They had a good time, and so will you reading this record of how the B-24s are built. F. E. J.

TREATY PORTS. By Hallett Abend. 258 pp.; index. Doubleday, Doran & Co. $3.00.

The treaty ports of the Far East are those where the foreigners, principally the British and Americans, forcibly insisted on establishing trading communities which were in effect colonial dominions with

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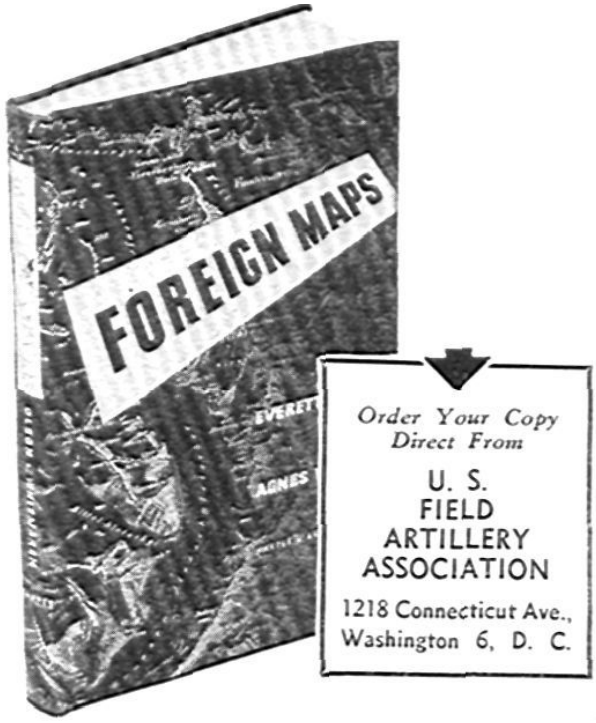

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their own courts, police, and other perquisites of sovereign nations. The first treaty ports were forced out of China by the Treaty of Nanking in 1842. Extraterritorial rights were not relinquished by Great Britain and America until 1942, so for 100 years these centers of lusty political, moral, social, and economic sin flourished.

Their story is a fantastic one, interwoven with choice tales of political skullduggery, bawdy accounts of vice, and shameful dealings by the foreigners. Their development goes hand in hand with the development of American foreign policy, and the gradual unfolding of this policy should be one of the most interesting sections of the book.

Unfortunately, Hallett Abend has tried to tell two stories—the social and the political development of the treaty ports—and so finishes by writing a full story of neither. He switches from "China Coasters"—those famous Far Eastern prostitutes—to missionaries, from Russia to the Boxer Rebellion, and from social horse racing to political horse trading without any apparent plan. The individual chapters are very entertaining and are packed with sound information, but the book as a whole is one of unfulfilled posibilities. It badly needs a map showing the places discussed (the one given is useless).

Despite these uncomplimentary remarks the book is worth reading if you want to know why we are fighting Japan, and are interested in the scandal of life in the Far East. R. G. M.

RIVERS OF THE EASTERN SHORE. By Hulbert Footner. 368 pp.; index; illustrated. Farrar & Rinehart. $2.50.

Maryland's mainland held some of the country's earliest settlements, so it was natural for the inhabitants to call the land across Chesapeake Bay the "Eastern Shore." And "Eastern Shore" it has remained to this day.

Little change has occurred there in any way, through the years. Its low, flat land is so fertile and its climate so equable that it was quickly parcelled out; there has been no immigration to affect its people or their way of life. Well off the beaten path, the "Del-Mar-Va" peninsula was (and still largely is) a destination, not a way-station. Thus it has lived a self-contained life. Its people have developed their own culture, and at the same time clung to more old English traditions than any other section of the country, with the possible exception of some remote communities in the Smokies.

Through the Maryland portion of this tri-state area flow all its rivers—17 of them. These are used to unify Mr. Footner's sympathetic account of the history of this region. At times this has been quite turbulent: the early Catholic and Puritan settlers fought one another, during the Revolution Tories found the marshes and waterways ideal hideaways from which to launch their forays, in more recent times the oystermen waged their private wars. Much of it, though, has a serenity not found in more bustling sections. Mr. Footner, a native Marylander, has dug up many yarns, tall tales, and legends to top off his account.

MEN OF SCIENCE IN AMERICA. By Bernard Jaffe. 572 pp.: index; illustrated. Simon & Schuster. $3.75.

One of our wide misconceptions is that Americans have been backward in pure science, despite their wide technological adaptations. This thought is effectively demolished in this book, the first comprehensive treatment of American science.

Its author—whose time is divided between teaching science, studying its history, and writing books about it—tells his story in terms of the lives and achievements of the scientists themselves. This is an effective technique, especially since it goes beyond mere biographies and relates the men and their work to their historical backgrounds. Mr. Jaffe also considers the mutual influences of historical, political, and social events on the one hand, and scientific development on the other.

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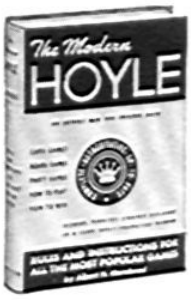

By Albert H. Morehead

This comprehensive book by an expert at all kinds of games includes Acey-Deucey, Anagrams, Casino, Checkers, Chess, Gin Rummy, Dominces, Honeymoon Bridge, etc. The author is an authority on games rules, and is editor of card games for the New York Times and publisher of the Bridge World magazine. He has provided a complete alphabetical index of the games and of the terms used in the book. Scoring, penalties and strategy are explained in a clear, easily-understood manner. This is an entirely new and original work with all the methods and penalties actually used today by the best players. **$2.00**

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