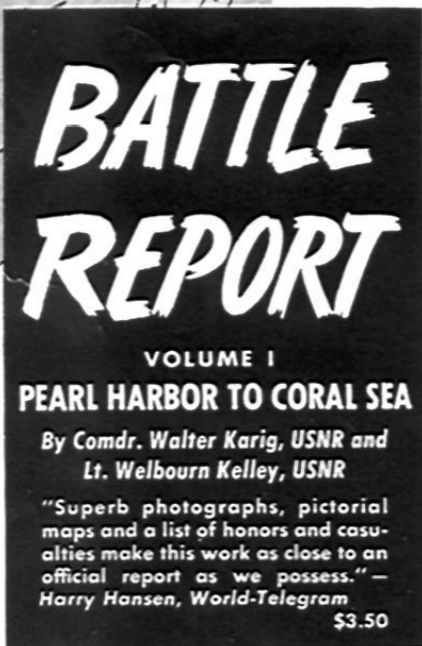


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MAY, 1945

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# The Field Artillery Journal

MAY, 1945—Vol. 35, No. 5

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DR. JOHN E. COLEMAN, Editor  
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FRANKLIN D. ROOSEVELT died the most of this issue was already read. He was the first President to lead a war. Service personnel everywhere mourn the passing of our national Commander-in-Chief, especially at this time when victory is a fact. His experience in international affairs will be sorely missed in the months to come.

FIELD ARTILLERY is so complex and so a branch of the service as any. In our units are as self-sustaining as we have our own "signal corps," "engineers," "air force," maintain our own services.

Every aspect can be covered in each of our Journal. For one thing, there isn't enough space for all ramifications to be discussed and described. For another, the papers are more articulate than others, and a lot more time or opportunity to give their operations or developments. For a period, however, these pages give rounded coverage to the artillery aspects of our warfare.

These articles are the outgrowth of painstaking search backed up by battle proof. Artillerymen realize they will want to read them in their greater leisure of peace. They have no facilities for keeping a file and issues with them in battle, they have to duplicate copies to their homes. In this way their friends and families learn what they are doing and how they go about their work. Members are assured a complete and complete demobilization finally comes. Perhaps this is a solution for some of your needs.

ANOTHER POST-WAR MATTER is the discussion in the question of United States Military Training. Military men do not want war to come to our country. In tactics, "an offense is the best defense," in international relations the same is substantially true, except that it can be varied to read "responsibility of offense is the best defense."

Was interested in hearing from any of you may want to sound off on either side of the question.

OUR COVER shows a 240-mm howitzer of the 18th FA Bn in position near San Marino, Italy.

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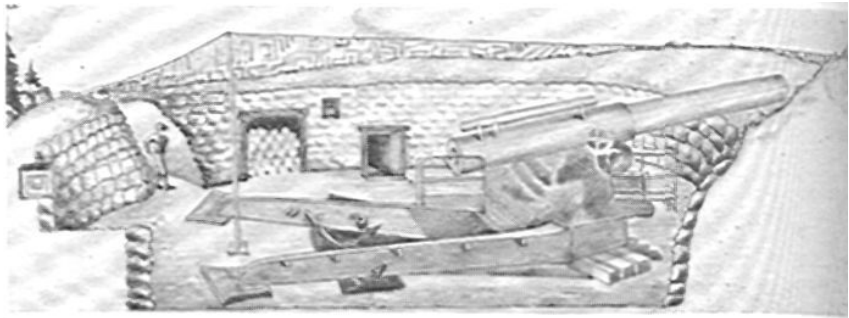
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# One Year of Combat With the 240s

## *Saga of the 698th FA Bn*



By Lt. Col. C. V. Clifton, FA

*Sketch A—The 240-mm howitzer in prepared firing position, during a stabilized situation?? this instance the howitzer is almost "dug in" on the reverse slope of a hill. Note the ?? and ammunition entryway, the powder shelter, telephone box, and entrance to personnel ?? out. Camouflage net covers the entire installation. On the side of the pit not shown in ?? are the projectiles, fuze shelter, and another personnel dugout. From 12,000 to 15,000 ?? bags are used for each howitzer emplacement.*

The U. S. Army's largest field piece, the 240-mm Howitzer, has completed its first year in combat. Participating in three campaigns—from Cassino to Rome, the battles of Northern Italy, and in the Seventh Army's drive to the Rhine—our battalion has fired more than 20,000 rounds. Of the 366 days which have elapsed since we joined the Fifth Army near Cassino, the battalion has been "in the line" 312 days, a normal percentage for all Corps and Army artillery in this theater. The Italian Campaign employed the 240-mm for the first time in this war.

Our battle experience has not been unique, and our lessons learned in combat have been learned by many others. Aside from technical developments peculiar to the weapon, however, there are some things of a tactical and technical nature that may be of interest to all artillerymen.

We had trained for 2½ years at Fort Bragg with the old 240-mm (Model 1918), and our men and officers were veterans of the "jack handles up, jack handles down" school. We had but one service practice with the M1 as a preface to our entry into combat. Little was known of the capabilities or of the problems of handling the weapon. In this year we have learned to handle our weapons effectively and efficiently, while higher headquarters has adopted definite policies for the economical employment of the 240 battalion in the Corps Artillery. A highlight of our combined work was the development of the Arty/R technique to a new level of perfection which is now a part of FM 6-40.

### FROM CASSINO TO ROME

#### *Static Phase*

In our operation between Cassino and the fall of Rome there were two distinct and interesting phases. The first phase, a period of four months, was a stabilized situation, in which movement of the pieces was only to change position for better defilade, to reach a special target, or to avoid counterbattery that had become too intense. It was during this phase that our training ideas on reconnaissance, occupation, and organization of position were radically changed.

Our U. S. training SOP had produced an idea that a battalion of 240s should be placed in an area approximately 2,000 yards wide,

with 500 yards between batteries and 200 to 300 yards between pieces. All pieces were to be within yards of a good road: battery rear echelons were to be approximately 300 yards from the battery, to the rear and ?? if possible. There was no such position area available, ?? the mud and muck of the Liri Valley, with limited roads ?? an abundance of all calibers, 240s had to be placed singly ?? off the roads. In this situation we arrived at the follow?? conclusions about 240-mm howitzer positions.

Prior to reconnaissance definite missions for each ?? must be determined, since it is the range of the targets ?? finally determines the locale of the position area and it ?? azimuth of the center line that determines the best position?? be occupied. Minimum range and defilade are two very ??portant considerations.

Once the position is chosen, detailed plans and prepar?? for occupation must be made. If necessary, Engineer help ?? be obtained to build an accessible approach to the spot. ?? gineers have a multitude of tasks, however, and we plan, ?? marily, on doing our own work. This calls for add?? training on the part of the officers and men.

Two final rules we learned the hard way. First, posi?? should be at least 1,000 yards from a road junction of ??tance (it isn't the accurate interdiction fire that gets you, ?? the "drunken gunner" that misses the RJ by 500 yards ?? gets the battery). Secondly, stay away from any impor?? bridge. You seldom can avoid other artillery, although ?? too is desirable.

Finally, when all plans are made the job is done in ab?? blackout, and the completed picture—utilizing logs, st?? available material, and sandbags—looks like the accomp??ing Sketch A. When sandbags are used (as was the cas?? Italy), we put 12,000 to 15,000 bags on each howitzer ?? placement. These preparations, properly camouflaged, ?? many lives for us. We have taken direct 170-mm hits ?? emplacements and the walls fell down, but there were no ??ualties in the pit or personnel shelters.

When the battalion was in its initial position, pieces ?? emplaced over an area 10,000 meters in depth and 6,000 ?? in frontage. One can easily visualize the increased probl?? in fire direction (we had a separate chart for each batter?? registration of one battery gave no accurate corrections ?? range or deflection for either of the others) and comm??tions. Since room, cover, and concealment for rear ??

were lacking, battery motor parks and maintenance and supply installations were established five to seven miles to the rear. Our imagination in training had never reached these bounds.

While we were adapting ourselves to these new conditions, higher headquarters were evolving the principles of employment which have stood the test of a year of battle. These howitzers have been used for everything from direct support of infantry troops (we chased Tiger tanks and four heavy machine guns one day with an observed mission) to the more normal general support missions of harassing and interdiction fires deep in enemy territory; counterbattery, both observed and unobserved; and—of prime importance—observed destruction missions.

The first guide to the effective employment of the 240s is the list of "available targets." As we first came into action in Italy there were two classes of targets for which we were sorely needed: the German 170-mm guns and the many bridges on the enemy supply routes into the Liri Valley. So the howitzers were placed initially to reach deep into the valley (putting them well forward), covering the known enemy 170-mm gun locations and the bridges. By fanning them out, the fire possibilities put at least a battery on every part of the Corps front.

This solution was good throughout the various battles for Cassino and the attack of May 11th. In this period of 4 months the only movement was to place a 240 very close to the front lines to reach an important bridge on the Melfa River to help isolate the battlefield of the Liri Valley and its adjoining mountains.

Missions other than "bridge busting" included assisting in the reduction of the famed Abbey de Monte Cassino, destroying German pillboxes and strongpoints in the Hotel Des Roses and in the Coliseum at Cassino, and as counterbattery where other artillery could not reach. The destruction of the bridges in the program of the "isolation of the Liri Valley" is a story that belongs to the development of Arty/R.

It was the advent of the 240 that gave us a weapon of sufficient range and accuracy to justify the use of high performance aircraft in the adjustment and surveillance of artillery fire. It was in this same period of operations that the technique known as Arty/R procedure was brought to a systematic routine. This procedure and some of the results have already been the subject of articles in this JOURNAL. Suffice it to say, Arty/R shoots have been the backbone of 240-mm effectiveness in destroying enemy bridges and enemy guns, this battalion alone accounting for 25 bridges and 90 guns in 260 missions.

The first successful mission is worth description. It was on the famed Pontecorvo Bridge on the Liri River, at a range of 23,500 yards from the GP. Prior to this time the huge masonry and concrete structure had been the object of numerous bombing sorties, none of which had scored a hit. Germans were still using it 24 hours a day for supply.

In the winter month of February, with adverse flying and observing weather, we joined with the XXXth Observation Squadron in 9 Arty/R missions on the bridge. Six of these missions were successfully completed; we fired 189 rounds and scored 11 hits, dropping two of the huge spans in the river. A photo, as it was prepared for the pilot for the first mission, appears herewith. Note the 100-meter concentric circles around the target, and most important the *line of fire* of the piece selected for adjustment.

It is of interest that in this theater the Air Corps pilot "ranges" or adjusts at first, the FDC giving him exactly what he requests, until he announces that he will "sense." Then the mission becomes one of surveillance. The FDC controls the

changes, basing them in range on groups of three (firing a precision adjustment) while the pilot gives the sensings for every round.

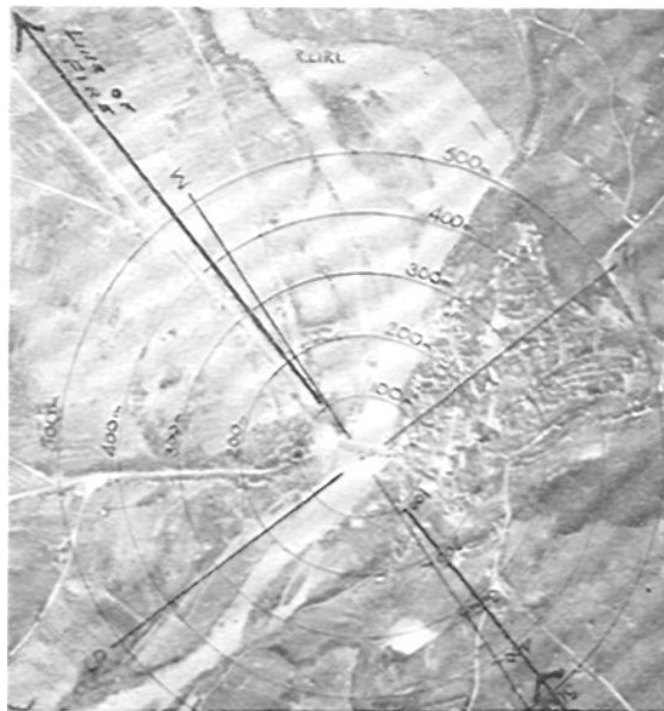
In the observed counterbattery missions with Arty/R targets were selected by photo-interpretation, verified by sound and flash locations, and then "laid on" with the squadron by the liaison officer. Details of preparing the photo, the correct radio channel to be used, call signs, and the hour of the shoot were carefully coordinated. The howitzer was ready to fire with the latest *K*-transfer data when the plane checked in.

Undoubtedly, as far as principles of employment are concerned, the major decision made by Corps and Army Artillery commanders was that our heavy ammunition was not to be used to "deepen" the fires of other calibers. Ammunition is too precious and the 240 too effective when proper observation is provided, to waste its potency.

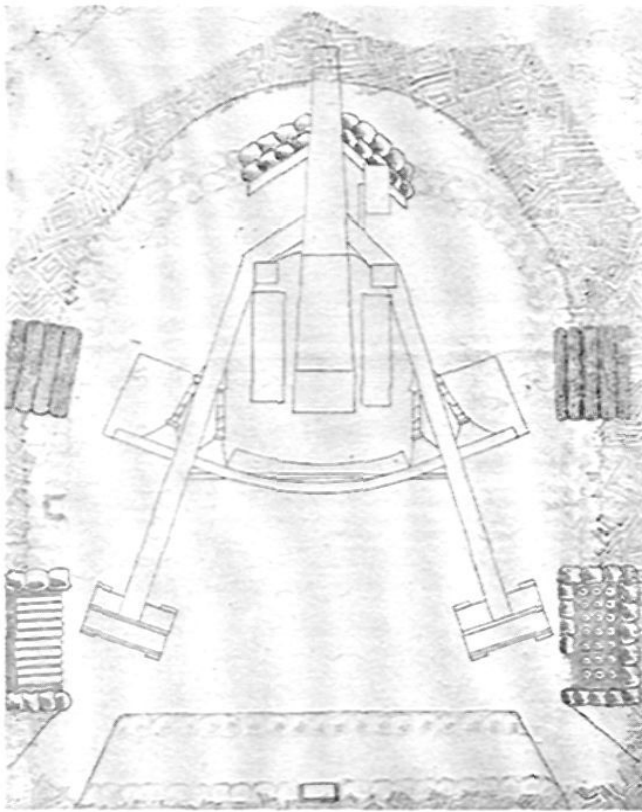
#### *Mobile Phase*

The second phase of operations, a period of approximately one month, began with the Fifth Army's offensive on May 11th. During this advance we learned some new ideas on positions and, again with higher headquarters, developed the technique of "fire and movement" that enabled us to give continuous 240 support in a rapidly-moving situation. We supported the French Corps in this period, as a part of a U. S. Artillery Brigade. It was for the accomplishment of this difficult support mission that the battalion was awarded the Croix de Guerre.

Three differences marked these positions in movement. (1)



*This air photo, a vertical enlarged from a strip series of Tac/R photos, shows the Pontecorvo Bridge in the Liri Valley. The photo is prepared for the pilot-observer in a 240-mm Arty/R shoot to destroy the bridge. Note the concentric 100-meter circles around the target, to aid the pilot in "sensing." The important "line of fire" of the selected howitzer and the compass orientation facilitate the adjustment. Bridge was destroyed with 11 hits at a range of 23,500 yards.*



*Sketch B—Top plan view of the 240-mm howitzer emplacement in a moving situation (center of camouflage net omitted). Near the left trail are the powder pit, telephone box, and personnel dugout. In front of the equilibrator is a combination log-and-sandbag revetment protection. On the right trail are projectile pit and second personnel dugout. In lighter shading the sketch shows how this minimum installation is expanded, as time and situation allow, to the complete installation shown in Sketch A. The back wall is also closed in, protecting personnel and material from flying fragments of enemy counterbattery "overs."*

Reconnaissance was continuous, and always up to the most forward point of advance of the infantry. (2) Many daylight occupations were permitted, since enemy air observation and enemy artillery were lighter. (3) The emplacements themselves were always close to a road and with a minimum of protection. Sketch B shows the essential pits, shelters, and other protections considered minimum. These were always constructed.

In employment, we did not attempt to emplace the battalion to cover the Corps front. Rather, to give continuous 240 support, we "leap-frogged" the batteries, taking the additional step of displacing one battery *immediately* that the forward battery was in position, thus keeping a battery always "on wheels" ready for the next move forward. As a battery began its displacement (which took three or four hours), its commander joined the battalion commander on reconnaissance; they selected positions as far forward as possible.

Targets were the same: bridges and counterbattery as observed missions, and any and all targets that required the long range. This was where the Air OP came into its own with the 240s. The far-sightedness of the Fifth Army in providing each 240 battalion with an L-5 paid tremendous dividends.

Arty/R was not forgotten, however, and since the battalion was also equipped with a jeep-mounted 522 radio, targets of opportunity (selected by the P-51s and Spitfires) were engaged almost daily, in addition to the prearranged Arty/R missions.

#### BATTLES OF NORTHERN ITALY

The campaign in Northern Italy gave us 99 more days of combat which were marked by a new high in problems of movement. The mountains of Northern Italy (where rested the great Gothic Line) with their narrow, winding mountain roads, posed a real problem.

Throughout the battles of the Arno Valley and beyond, 240-mm howitzer battalions were called to furnish many fires for the infantry, in direct support, destroying fortifications and pillboxes, interdicting natural routes of enemy advance through forests and valley, and pounding enemy assembly areas. It was here that we furnished non-T/O forward observers from the survey teams to infantry battalions to pound out pillboxes that were holding the advance. In several cases infantry troops already engaged were necessarily withdrawn a few hundred yards while the big guns went to work.

Perhaps the biggest question mark in movement was the road through San Giorgio Pass, east of Futa Pass and leading from the Sieve River Valley into the Firenzuola Valley. Two batteries of the battalion began the climb early one morning and came down the other side into position areas 10 hours later. Hairpin turns with steep slopes had to be "double-tanked" to pull the long loads around the turn; winches were used on several occasions. Rain and mud didn't assist the move. When the battalion finally came into position we knew that the Ordnance had furnished us a wonderful howitzer—accurate *and with real mobility*—which had proved its effectiveness against the "krauts" in battle.

#### DRIVE TO THE RHINE

Existence in battle is a continual lesson in artillery, and the drive to the Rhine in France was no exception. Three outstanding facts came to light for our equipment in those days of mud and winter. First, forest positions do not afford much of an advantage to these howitzers. If nestled in the forest, too large a space has to be cleared for the emplacement of the pieces—camouflage can never be adequately restored. A field of fire 800 miles wide and deep enough to get a good minimum



*Members of a 698th FA Bn howitzer section listen to an orientation speaker during a lull in the firing near Cassino. Of prime interest to 240-mm cannoneers is information about the targets they have fired upon, and their part in the war.*

elevation must be cleared; it immediately reveals the piece location. The men and officers of this battalion concur, with many others, that the forward edge of a wood is not a "best" position, either, with heavy materiel.

The second lesson taught us the real value of forethought and "prior planning" by higher headquarters. Full appreciation of the advantage of foreseeing a move saved us many hazardous marches on snowy or wet, muddy roads. When such moves were not foreseen we moved at night without sufficient prior reconnaissance, and the result frequently became bogged cranes or tanks or cannon carriages with resultant hours of winching and frequent damage to equipment. If the higher headquarters realizes the time-elements involved in displacement and emplacement, taking full consideration of weather and road conditions, the 240s can keep up with any moderate-speed advance. When these elements are not considered in the planning, the big guns are not there when the shooting commences.

Finally, a new element entered our tactical employment—the built-in minimum range of the 240-mm, which is 8,000 yards. In any defensive plans the howitzers must be kept far enough back so that all pieces can support the MLR. Further, since we attempt to cover a Corps front, the closer we get the less coverage we derive from the "fan pattern" of fire possibilities. For these two considerations, on the defense, you necessarily sacrifice the use of your range. If an especially desirable target at an extreme range is to be engaged, one piece for the mission is displaced forward to engage the target.

After a year we have come to the conclusion that our weapons can go anywhere that the rest of the artillery can go. We are convinced that if the battalion prepares in its training to operate separate FDCs, to put in lines of communication that stretch 10,000 meters between batteries and to keep them in, and to fight every hour of the day for registration and for observation the minute the weather breaks—that battalion of 240s will be of inestimable value to any Corps its supports.

---

## ARTILLERY RECONNAISSANCE (ARTY/R)

By Capt. Paul L. Miller, FA

It is not the purpose of this article to debate the merits of high performance aircraft observation as opposed to other available observation means. After all advantages and disadvantages of Arty/R are discussed, the fact remains that in many situations it is the only satisfactory type of observation at the longer ranges of heavy artillery. Organic airplanes can usually furnish reliable observation at firing ranges up to eighteen or twenty thousand yards, but beyond this point nothing can substitute for high performance aircraft.

The suggestions which follow are based upon the experiences of 300 days in the line in Italy and France with a heavy battalion which was the first to use Spitfire and P-51 observation continually and on a large scale. We found that successful Arty/R is based on four factors: intelligent target selection, detailed prearrangement, communications, and adherence to basic gunnery principles.

### SELECTION OF TARGETS

Targets for Arty/R are generally selected by Corps Artillery. Aircraft are made available, however, through Army, so the Army Artillery Section will frequently select targets. In any case two principles govern: (1) the target must be of sufficient importance to justify the use of high performance aircraft, and (2) it is wasteful to select any target which can effectively be engaged by organic artillery observation planes. As a result, the great majority of Arty/R shoots fall into one of three categories (registration, destruction, and counterbattery) and are generally fired at ranges between 20,000 and 35,000 yards.

*Registration* is the least common type of mission, since an adjustment for this purpose can usually be obtained by other means. In some terrain, however, Arty/R is the only solution. In any terrain, registration of 8" guns in the ranges at which they are normally employed, is seldom possible without Arty/R. These missions are frequently combined with counterbattery or destruction when good coordinates of the target can be obtained by map spot or block plot from air photos.

*Destruction* missions need little discussion. The most common targets are bridges and railroad installations, although a few missions have been fired on towns, ammunition dumps, and warehouses.

*Counterbattery* targets fall into two classifications, depending on what effect is sought. When neutralization is desired, the pilot

### AUTHOR'S NOTE

**Arty/R was first used on a large scale on the stalemated Cassino and Anzio fronts in the early months of 1944. Initially, difficulties were encountered with procedure, communications, enemy radio jamming, and flak. All of these were overcome as pilots and artillerymen gained experience. By 11 May, when the attack pushed off, the devastating counterbattery and the isolation of the battlefield which had been accomplished by heavy corps artillery with high performance aircraft observation, were big factors in our success. Arty/R proved then and is continuing to prove the best means of fully exploiting the capabilities of our heavy guns and howitzers at long ranges.**

is briefed on several locations which are engaged, with bracket methods, in prearranged order. This is the most common type of Arty/R mission for the 155-mm Gun M1. When counterbattery destruction fire is sought the pilot is briefed on only one or two locations, and precision methods are used until one or more direct hits are obtained in the gun pit or on the gun itself. The weapon best suited for this type of fire is the 240-mm Howitzer M1.

In the selection of any type of target for Arty/R missions it is a good policy to have the pilots briefed on alternate targets so that the sortie will not be wasted if the primary target has moved or been destroyed, or is obscured by clouds.

### PREARRANGEMENT

The nature of Arty/R firing makes prearrangement an absolute necessity. All details must be thoroughly understood by the pilot and by the S-3 of the firing battalion. The pilots are normally briefed by a liaison officer from the Army Artillery Section. The following information is required:

1. Target description and location.
2. Time over target.
3. Type of fire (1-gun precision, bracket, etc.).
4. Line of fire.
5. Whether smoke is available.
6. Radio channel.
7. Probable flak locations.

Whenever possible (nearly always) the observer is given a vertical photo of the target area of approximately 1:12,500 scale. On the photo the target is indicated, and surrounded by concentric circles at 100-yard intervals to facilitate sensing. The line of fire is also indicated. Both the observing pilot and the pilot of the "weaver" (covering plane) are briefed so that the weaver can take over the mission if required.

The S-3 of the firing battalions must be supplied with the pertinent parts of the above information. In addition, all available information on the size and construction of the target should be included. This is especially important for destruction missions.

If prior experience in the area or the number of AA locations on the enemy battery list indicates the necessity, it is well to have the Group or Corps Artillery S-3 assign a battalion of 155 Guns to stand by for counter-ack-ack during the mission. On many occasions when the mission might otherwise have been abandoned due to heavy flak, the pilot has adjusted on and neutralized the hostile AA guns without interrupting conduct of the primary mission.

#### COMMUNICATION

Air-ground communication is established by use of a radio set mounted in a command car or a 12-volt radio jeep. This is an air corps set with four pre-set channels. It is highly vulnerable to damage from jolting. The vehicle in which it is mounted should never be used for any other purpose, and should be moved about as little as possible.

Mounted sets are supplied and serviced by the TACAF attached to Army. Sets are issued to headquarters of Corps Artillery and of the heaviest battalions of corps artillery. When another battalion is assigned an Arty/R mission the radio is sent to its area, where it operates directly with the FDC involved. When this is impossible, sensings are relayed by wire.

Due to the very high frequency range in which the set operates, it has pronounced line of sight characteristics. An operating station must be established on high ground and wire laid from it to the battalion switchboard. When time prohibits laying wire, communication from the radio station to FDC is by SCR 609.

Normal air-ground procedure is followed. Some squadrons use British methods ("Right 200 Add 400"), others the normal American sensings. The observer is given "*Splash*" 5 seconds before the round lands. Some headquarters prescribe a "standardized time of flight." With this procedure the S-3 controls the transmission of "*On the way*" and the command to the gun to fire, in order to give the pilot exactly one minute between "*On the way*" and "*Splash*." *Any method works* if it has been prearranged so that both observer and S-3 know what to expect.

#### CONDUCT OF THE MISSION

In general, missions are conducted in the same manner as any air-ground mission. There are several points, however, which should be borne in mind. Every effort must be made to speed up the mission in order to take full advantage of the limited time the plane can stay over the target area (roughly, 75- to 90-minute maximum). Initial data should be computed carefully. If possible, the piece or battery should be registered within easy transfer distance of the target in order that initial rounds may be as close as possible: five minutes of observation time are more valuable than the four or five rounds required for a C1.

Most of these shoots are conducted near the maximum range of the piece. As *c* changes rapidly at these ranges, the firing tables should be used for large changes in range during adjustment. During fire for effect in precision fire use the fork to adjust the center of impact. When firing for effect in a destruction shoot which will require a number of hits, shoot groups of six rounds before changing data. Disregard the amount of the sensings: count overs and shorts and apply the old rules. This seems obvious—but not many of us are used to having a sensing on the twelfth or eighteenth round for effect, and basic principles may be forgotten.

On counterbattery neutralization shoots with several different targets it is sometimes well to get an adjustment on each scheduled target before firing for effect on any of them. If the observer then has flying time remaining he can give surveillance on the fire for effect.

On counterbattery destruction shoots there is a tendency to fire too little for effect. Firing should continue until at least one direct hit is obtained on each piece in the enemy battery.

---

## KNOW YOUR P. I.

By Maj. F. L. Johanns, Jr., FA

In the G-2 Section of every Division, Corps, and Army in the European Theater of Operations, you will find Photo Interpreters. These men can save you much time and trouble. They can also help you create trouble—for the enemy.

The most important function of the PI, from the artilleryman's viewpoint, is the determination of the exact location of enemy batteries. This use of the interpreter was developed in the closing stages of World War I. In this war many new uses have been developed throughout the campaigns in Africa, Italy, and Western Europe.

#### ENEMY BATTERIES

Location of enemy batteries is of primary interest to Corps and Army artillery. On any front, the interpreter can identify and locate a large proportion of these positions. Units

concerned with counterbattery fire usually keep a PI officer at the airfield so that he can radio changes in battery locations and thus eliminate any possible time loss in the delivery of photographs.

As soon as a sortie is developed, and during the preliminary or 1st Phase interpretation, the counterbattery officer secures the photos which contain the installations or area in which he is interested. From these photos he will determine the operational status of the battery concerned. All known or suspected batteries are posted on a map, and often an indexed card system (with brief histories of the positions) is kept.

In many cases a positive or a probable location will be made. Where natural camouflage is plentiful, however, such as in Normandy, or where positions have been deliberately prepared, such as the Siegfried Line, other intelligence will aid the interpreter. Sound, Flash-Shell, and I.P.W. reports will periodically



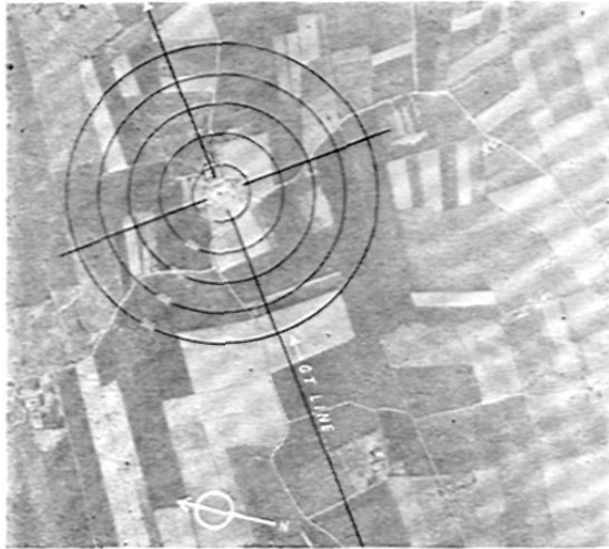


Figure 1

center the interpreter's interest in a certain area. Knowing that an enemy battery is firing from this area, the interpreter then selects the tell-tale marks as the probable location. Thus, with a combination of all other intelligence and by the use of photos, the interpreter can send out in 8-digit coordinates the exact location of a battery which might otherwise remain unlocated.

#### TARGET PHOTOS, OBLIQUES AND MOSAICS

Photos for the use of observers are prepared in many ways. The Merton Grid, when not prepared by the Air Corps or the Engineers, can be done by the PIs. There are many times, however, when the proper photography necessary for the production of the Merton Grid can not be obtained. In these cases the interpreter can prepare other equally effective types of photos for the observer. He can grid both verticals and obliques with either a map or an arbitrary grid.

A vertical photo with the target as the center of a series of concentric rings each 100 yards apart will help the aerial observer. If the GT line is known it may also be plotted; sensings are then given by the clock system and the distance from the target (see Fig. 1). The target photo has many variations (see Fig. 2), but in all cases it will be annotated to aid the observer.

As prepared by PIs, the uncontrolled mosaic is accurate only at the pinpoints of the map grid coordinates. Distortion (if any) in the photographs will cause the grid squares to be irregular. An accurate location can generally be determined, however, by interpolating between the distances to the four corners.

The additional detail of information contained in a 1/10,000 mosaic will often enable the selection of a more accurate pinpoint than is possible on a 1/25,000 map. Consequently this mosaic can be successfully used as a firing chart.

#### ROUTES AND POSITIONS

In any movement the PI can save the artilleryman much time and trouble. He can obtain in a few minutes information that will save hours of reconnaissance. Detailed information on routes can be furnished. This will include information on the grades, turning radii, defiles, and general conditions of roads. If part of the march crosses open country, impassable areas can be checked and by-passes can be found. Often the types and



Figure 2

capacity of bridges are estimated, and in the event these are blown fords and bridge sites can be found.

The interpreter can give you information on possible battery sites. An area which may appear worthy of reconnaissance from a map may prove to be unsatisfactory after an inspection through the lens of a stereoscope. In the swift move across France many batteries occupied positions selected solely by the PIs. The same will hold true for OPs.

He can also locate the nearest concealment for vehicles and supplies, and will give you the size of small forests and wooded areas so that you can determine the number of vehicles which can be parked there.

#### TARGETS AND EFFECTS OF FIRE

Other PIs working under the unit G-2 are following the enemy actions. Defenses, supply dumps, bridges, communications, and troop or vehicle concentrations are being constantly watched. From the reports of these interpreters the value of these targets will be estimated. Shortly thereafter your guns may be firing on them.

After firing, you can still use your PI. He will be able to give you the effect on the target and the pinpoint of many of the bursts. Careful study under a stereoscope will give a better picture of the results than can be obtained from the eyes of an observer who is constantly moving.

The ability of an interpreter to furnish you information is necessarily limited by the photographs of the area he has available. At all times, however, he will have basic cover, and many questions can be answered from that. In a static situation he will have daily cover, from which he can give you the latest information.

Don't forget, the PI lives in the country ahead of you 24 hours a day. He should know it better than his home town, so use his information to save time and lives.

# Let PWs Help You Plan Your Fires

By Lt. Carl F. Maples, FA

**Brigadier General Theodore L. Futch, Artillery Officer 35th Infantry Division and former assistant commandant of the Field Artillery School, Fort Sill, was curious about the effectiveness of his artillery fire on the enemy. He sent Capt. D. E. Kennedy to the Prisoner of War enclosure to interrogate German PWs. This article was written from Capt. Kennedy's notebook with the hope that it may prove of value to other artillery units.**

This article does not attempt to establish any new artillery principles, but rather shows a method of applying well-known techniques and proving them, first, by discussing the artillery planning for different phases of combat, and then justifying and proving the effectiveness or ineffectiveness of that plan after execution by personal observation and interrogation of Prisoners of War.

## THE ATTACK

### *Mission*

In conjunction with the attack of the XII Corps, Third Army, the 35th Division received orders to attack to the northeast on 8 Nov 44 at 0600, line of departure being the front lines bordering the northeast edge of the Foret de Gremecy. This forest, a typical French woods, had been occupied by infantry of the division for several weeks. The Germans occupied a position in the direction of advance in the Foret de Chateau Salins and surrounding hills. By weeks of preparation and forced labor, they had built this area into a veritable fortified position.

### *Artillery Plan*

The attack of the XII Corps was preceded by an intense artillery preparation beginning at H-60 and extending until H+10. During the planning stages Corps artillery took responsibility for the location and coordination of targets 4,000 yards or farther from the front lines, while Division artilleries intensified their reconnaissance and planning to enemy locations between the front lines and the arbitrary 4,000-yard mark. Targets selected included known enemy locations and strongpoints, enemy batteries, troops dug in, road junctions, fortified towns, and enemy OPs.

Artillery directly available and reinforcing the Division included, in addition to the organic artillery, five light (105-mm) battalions, two medium (155-mm how.) battalions, and one 8" howitzer battalion, making a total of twelve battalions available. Enemy batteries were fired upon using at least two battalions firing one or two volleys TOT with open sheaf at center range using fuze delay, unless the slope of fall was less than 1:4. This counterbattery plan was coordinated by Corps Artillery FDC and included all medium (or heavier) battalions in the corps. During the preparation direct support battalions and their reinforcing units remained free to fire directly on targets of importance to the infantry before the attack. Towns were attacked with fuze delay, using a volume of fire TOT on enemy strongpoints.

The general plan behind the artillery execution was to attack a

variety of targets with a surprise effect on each, rather than to concentrate on several strong points to destroy them. By striking scores of targets it was hoped that an overall confusion and destruction would result throughout the enemy-held sector.

Our planning and artillery execution worked well, but what we really wanted to know was, "Had it worked on the Germans?" "Was it accurate?" "Were communications cut?" and consequently "Did we effectively neutralize our enemy, crush his defenses and morale?" Answers to these and many more questions were found by questioning Prisoners of War who had been on the receiving end of our crushing artillery blows.

### *PW Attitude in General*

A German PW is only a human being, although we often are inclined to think otherwise, and when captured is generally willing to help all he can to the limit of his knowledge. PWs' information is usually fairly reliable, but the prisoners cannot be depended on to a great extent in their pin-point locations of enemy troops.

### *PW Report*

A German master-sergeant (1559 Arty Regt, 559 Inf Div), an artillery observer and veteran of 13 years of army service, was in the town of Oriocourt when caught by the artillery fire of the preparation. Later captured, he was very willing to discuss artillery techniques and other varied subjects. Although this man felt that our artillery fire had been very accurate, he believed that it was too highly concentrated to be as effective as possible and suggested we should cover a larger area with a concentration. The preparation, he explained, had greatly affected the morale of the troops, but as a whole did not produce many casualties because the Germans were too well dug in; our fire had, however, completely disrupted communications (including his own communications with his battery) and denied to the Germans the use of roads for supply, evacuation, and reinforcements. In the town of Oriocourt the TOT had been very heavy and accurately hit the town, but this man and others verified that there had been many duds. (We soon discovered that often when fired into a town the delay fuzes, when they struck a masonry building, were broken off from the shell, thus preventing detonation. This rapidly brought a change to use of fuze quick for firing into towns.) Answering further questions concerning his battery, the sergeant disclosed that if possible it never occupied positions in the edge of woods because of a fear of tree bursts from our counterbattery fire.

A corporal (26 Btry, 975 Coast Arty Regt), acting as a battery computer, felt that the preparation had been very accurate and effective but did not think that light artillery had nearly the effect on the towns as did our heavy and medium artillery. He verified that the preparation had completely severed communications. In his battery, he added, our constant artillery fire had greatly reduced the morale, resulting in sloppy laying and slow firing.

An infantryman (8th Hvy Weapons Co, 1126 Regt) was in position with his company when one of our preparation concentrations was fired on their position. More than 35 men were wounded and 20 were killed, forcing the unit to withdraw and reorganize.

## THE COUNTERATTACK

### *Situation*

A battalion of the 134th Inf on 12 Dec 44 had successfully bridged the Blies River, the German border, at Habkirchen and taken up a defensive position protecting further crossings at that point. Intelligence channels predicted that the enemy would counterattack either the night of 12-13 Dec or on the 13th. The terrain (see sketch) surrounding Habkirchen includes flanking hills to the north and northeast with a main road in the valley between leading to the town of Bebelnheim, reported center of German supplies in this sector. This terrain, with the disposition of our troops, made possible a counterattack from three different directions.

### *Artillery Plan*

In conjunction with their own infantry and the adjacent artillery battalion, the FA battalion directly supporting the 134th Inf Regt prepared a "curtain of fire" in prearranged missions, covering all approaches to the town as well as the flanking hills. These prearranged fires (based on study of both terrain and map) were relayed to all artillery units in the division sector capable of firing in that sector. These included four light and two medium battalions, in addition to the larger calibers available from Corps Artillery.

First evidence of a counterattack was received shortly after 0030, 13 Dec 44, but it was impossible at such an early stage of an attack in darkness to determine its main effort's direction. Normal barrages were fired by the direct support battalion, and several prearranged concentrations were called for. These prearranged missions were fired with battery concentrations firing battery one round every two minutes (in the case of the light battalions) and battery one round every four minutes (in the case of medium artillery). After continuing for an hour, battery volley concentrations were reduced to platoon volleys and finally to one gun every two minutes. This reduction was ordered on request of the direct support battalion.

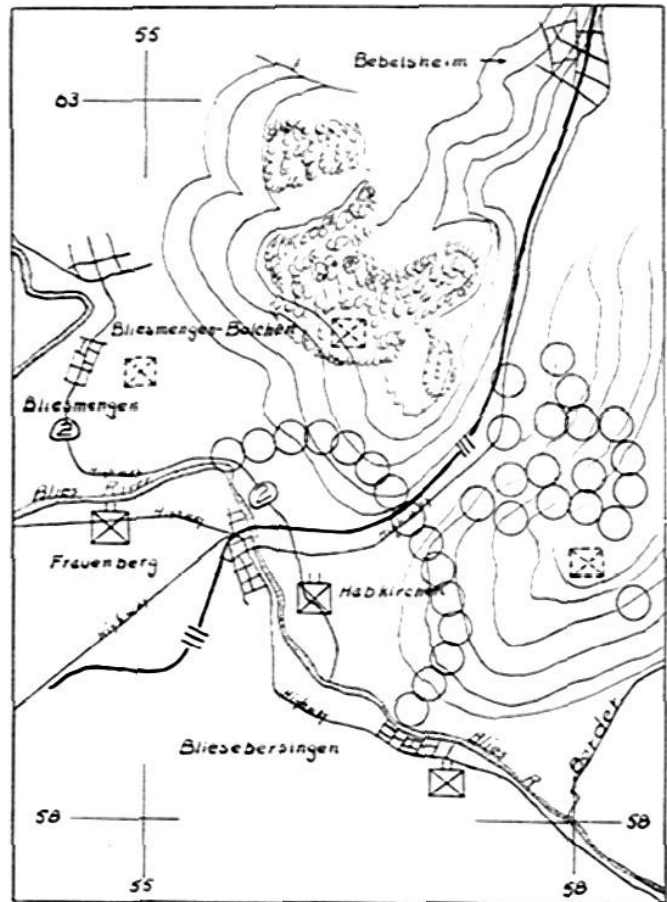
Later in the morning increased activity on the main road to Bebelnheim became apparent. A "road runner" using battery volleys traversed the road to Bebelnheim, a distance of 2,500 meters, and in addition heavy artillery interdicted that town with battery volleys. At daylight, liaison planes and forward observers firing at targets of opportunity finished off what remained of the counterattack.

### *PW Reaction*

One sergeant (9th Co, 38 Regt, 17 SS Div) came into position with his company on the 10th of December on the high ground east of Habkirchen. During the early morning of the 13th his unit suffered 50% casualties from artillery fire, and were forced to withdraw to the rear for reorganization.

The mission of the 5th Co, 165th Inf Regt, 36th Div, according to a captured Pfc was to attack from the high ground east of Habkirchen and destroy the American bridgehead. During the night of 12-13 Dec his unit received heavy artillery fire beginning at 0500 and the attack was smeared by artillery fire. In his own immediate vicinity 10 out of 30 men were killed or wounded, and he was positive that the artillery fire was the deciding factor in breaking up the counterattack. Another corporal from this company verified this report, stating that the artillery fire landed directly in the lanes of the attacking troops.

The company commander (1st Lt, Fusilier, CO, 165 Regt, 36 Div) had orders to proceed with his unit from Bliesmengen and attack the bridgehead. During the march the unit was pinned down by artillery fire and he ordered his men to the cover of the cellars



of adjacent buildings. Later after regrouping, while proceeding along the road 300 yards north of Habkirchen, this unit had many casualties and deserters as a result of artillery fire.

Soon after the attack of the 3d Co, 37 SS Regt was launched from east of Habkirchen, a 1st Lt. relates utter confusion was created by the artillery fire, breaking up the attack. Other PW reports were equally as interesting. Some PWs reported that the entire platoons retreated on the run, and all were unanimous in the fact that artillery fire had completely disrupted the attack. The first American bridgehead into Germany secured by this division was held successfully.

### IS OUR COUNTERBATTERY POLICY EFFECTIVE?

#### *Our Counterbattery Plan*

The principle used to attack enemy batteries is that of a volume of fire with a surprise effect. This is accomplished on observed missions by adjusting on a nearby point (if the battery can be located on a map) and then massing fires of all available medium and heavier artillery, firing two volleys on the enemy battery. Accurate sound or flash plots of enemy batteries are attacked immediately with fire for effect TOT. At times, to increase the volume of fire when heavier artillery is not available, light artillery is used. AOPs have proven to be the most valuable source for enemy battery plots.

#### *PW Reaction*

A Gunner Corporal (1st Bn, 3d Btry, 1st FA Brig) confessed a fear of tree bursts throughout his battery, resulting in abandoning the method of selecting positions at the edges of woods. Using only natural camouflage, his battery now

seeks positions in the open, preferably with a hill mask. He further testified that the weapons were never dug in because of frequent changing of position—a result of our counterbattery—and often only dirt was piled in front of the guns. The policy of this battery was to march order and evacuate the position immediately upon the receipt of counterbattery, thus taking the resulting casualties rather than remaining to be totally destroyed. On 9 Nov 44 this battery received artillery fire destroying two guns and two vehicles and killing or injuring the battery commander and half the battery. Five days later more counterbattery fire killed one and wounded two of the crew of six serving with this prisoner, and forced him to abandon the gun. Claiming that 50% of these rounds were duds, the PW further was curious as to our methods of locating their position, because the minute they fired they drew counterbattery fire.

A Section Chief (1st Btry, 1st Bn, 361st Arty Regt) reports that an artillery concentration at 1900 hours 18 Nov 44, missing his own battery, fell on an infantry howitzer position to his rear, causing an unknown number of wounded and killed and destroying all the ammunition in the howitzer battery.

Disobeying the orders of their battery commander to remain in their dug-in positions when under counterbattery fire, the men of a machine gun battalion fled from their 20-mm guns when a heavy artillery concentration fell on them 19 Nov 44, and sought the cellars of the nearby town, where they found their battery commander had beat them by 10 minutes—so relates a sergeant PW.

A Corporal Gunner (26th Btry of the 975th CA) related that his battery (four French 105-mm weapons) had suffered two guns destroyed by counterbattery on 8 Nov 44 at 2000 hours, and that previously two of the other guns had been destroyed near Lemoncourt, at which time many of their horses were killed.

A PW (1st Btry, 1st Bn, 17th Arty Regt, 17th Pz Div) had an interesting story to relate concerning a TOT that struck his battery near the town of Frauenberg at 1700 on 8 Dec. Between 50 and 60 rounds of all calibers struck, catching the battery completely by surprise, destroying two guns totally in the 1st Btry and two in the 3d Btry, but only killing 1 and wounding 3. He further claimed that single rounds had caused more casualties than had concentrations of fire, because the men were not allowed to leave their weapons when single rounds landed. This battery, according to the PW, had received counterbattery in almost every position they had occupied for three months, but that invariably the concentrations had fallen to the left of the position.

The consensus throughout the group was that the morale in the German artillery was low primarily because of our artillery superiority. It is easy to see why this would happen when one of their battery salvos is answered in an artillery duel by 60 or more rounds of all calibers. It is equally distressing for us to hear that most of the prisoners claim our artillery has duds between 2% and 50% of the total rounds they have received.

Keeping the Germans pinned down during daylight hours, unable to move about on the roads and towns, has been accomplished by the AOP. Here is an answer, however, for limiting their night movement.

#### HARASSING AND INTERDICTION FIRE

##### *Artillery Plan*

With movement denied them during the day, the Germans

turned to night for the movement of supplies, equipment, and personnel. Artillery planning and ingenuity had to devise and handle harassing and interdiction fires, within ammunition allowances, that would be flexible and cover the routes of travel. Basically the plan called for a 24-hour schedule of harassing fires on all important towns and towns known to house or suspected of housing the enemy. Fired at the rate of between four and six rounds per hour at irregular intervals established by Corps timetable, harassing fires on towns outside divisional no-fire lines were usually fired by Corps with medium and heavy artillery under the jurisdiction of Corps.

On the other hand, interdiction fire is used only during the hours of darkness or when weather does not permit adjustment from the AOP. During a 24-hour period, organic division artillery fires on an average 28 interdiction and 32 harassing fires. (These figures were compiled as an average of the reports of four days picked at random.)

##### *PW Reaction*

Rounds fired at random throughout enemy territory would have a nerve-wracking effect on the enemy somewhat similar to the buzzbomb nervous tension, but here is a report of what controlled harassing and interdiction has done to the enemy during the day and night.

A Corporal (2nd Bn, 1125 Inf Regt, 559th Div) reported that his unit occupying a town on 11 and 12 Nov 44 received harassing fire for two days at the rate of about 1 round per hour. Of 70 men in the town 15 were killed, and all but 10 of those remaining were wounded. This same harassing fire also disabled a flak unit and drove the AT defense from the town. The irregular fire denied the Germans the use of the streets. Finally, after a personal inspection by the commanding general, the town was ordered evacuated.

Interdiction fire in the town of Faxe, Alsace-Lorraine, was so discouraging to the men that the lieutenant in charge called all the men together and urged them to surrender since their cause was hopeless.

A Staff Sergeant from a Reconnaissance Unit of the 11th Pz Div states that the single harassing rounds, although of little casualty effect, have completely denied the use of the streets to the Germans and that everyone now seeks the shelter of the basements. Furthermore, he continued, recent orders forbid the parking of vehicles in the towns.

A messenger (1st Co, 37th Regt, 17th SS Div) proceeding along a road with five other men was stopped by interdiction fire at a road junction. Three rounds burst near the crossing and one direct hit was scored on the intersection, resulting in two of the men being wounded. On 10 Dec, he continued, 19 men were caught at the same intersection by interdiction fire and eight were wounded, all of whom had to be evacuated.

A Sergeant (37th Regt, 17th SS Div) complained that his unit, situated near Puttelange, had been unable to sleep or move from their slit trenches because of interdiction fire falling on a nearby large crossroad. Furthermore, no supplies to the unit were delivered that night because of that fire.

This harassing and interdiction fire has been equally discouraging to the German civilians who, according to a prisoner, have been terrified to such an extent that they have even asked the soldiers to lay down their guns and surrender.

##### "THE EYES OF THE ARTILLERY"

##### *Artillery Use of the Liaison Plane*

The artillery "Piper Cub" section has found a real home in

artillery strategy and tactics—in fact, in almost every phase of army operations. Weather conditions permitting, two planes, each with an artillery observer, are kept aloft continuously from dawn until dusk. Routine flights for surveillance and adjusting of fires are usually limited to one hour for each plane, because on such routine flights the efficiency of the observer and pilot decline after 90 minutes aloft. With a mission similar to that of the artillery ground OP, the AOP, operating directly on the TD radio channel, has also proven useful in directing friendly tank destroyers against enemy tank formations.

#### *PW Reaction*

Indicative of the German fear of our air observation is the fact that, according to a captured order, the Germans are forbidden to fire small arms at our liaison planes because of fear of artillery retaliation. A Master Sergeant (1559th Arty Regt, 559th Inf Div), voicing the opinion of more than one prisoner, expressed a great fear of this type of observation and declared that it had a tremendous effect on the morale of the men and greatly restricted daytime movement. Another Sergeant (Recon 11 Pz), declaring that the Germans feared the AOP more than any other weapon, verified other PW reports that this observation and resulting artillery fire had completely restricted movement during the day, forcing all reconnaissance to be done on foot and denying the Germans the use of their motor equipment.

The following is an excerpt from a letter of a German soldier to his mother, and shows the inward feeling of the German soldier toward our liaison planes: "The artillery observers destroy our positions. Here our artillery is shooting a little more, but the answer always comes and in much greater quantities. We would all be very happy to see a few of our fighter planes which would bring an end to the *stueren*, which we call the artillery observers. Without any interference these dogs fly around all day *in our sky*. Against that one can only hide like a little mouse and do the rest at night."

#### CONCLUSION

There is still a vast field of artillery information that will aid our artillery, to be obtained from prisoners of war. The observations in this report were constructed from PW reports for a period of eight weeks. Obviously, it has been impossible to cover all phases of artillery technique as viewed by the PW, because of availability of prisoners actually affected by the various artillery techniques. This



*Few Nazi prisoners resemble supermen. They are battle weary, and dazed by our artillery fire. The "sad sack" at the right seems about to collapse into himself, like a limp accordion.*

factual information has proven, however, that we must keep our artillery abreast of the situation, following German countermeasures to escape our fire. Each man in the vast network of artillery fire direction and execution may perform a perfect job, but artillery effectiveness at the conclusion of the cycle can only be obtained when you have talked to the enemy on the receiving end and adjusted your policy accordingly.

## Firing Non-Standard Ammunition

From time to time some units will receive ammunition for which no firing tables are at hand. This situation is most apt to affect 155-how battalions, a number of which have already been given Schneider ammunition to fire in their M-1s. The first such outfits had to build up their own range tables. Now, however, GFTs for firing Schneider ammunition in 155-mm Howitzers, M1, are available from the Book Department, Field Artillery School, as follows:

- |               |                                                                                                    |
|---------------|----------------------------------------------------------------------------------------------------|
| Shell, Mk1A1, | Propellant M1A1, Charges 1 to 5<br>Propellant M2, Charges 6 and 7<br>Propellant M3, Charges 1 to 5 |
| Shell, M102,  | Propellant M1A1, Charges 1 to 5<br>Propellant M2, Charges 6 and 7<br>Propellant M3, Charges 1 to 5 |

Regular GFTs can be pretty well adapted for firing any special ammunition for which precise tables are not available. Fire a center of impact or high burst registration with the elevation corresponding to the red triangular gage point on the most suitable GFT available, considering caliber and muzzle velocity. Move the hairline to the measured range and draw an adjusted elevation gage line opposite the elevation fired and (if time fire is to be used) an adjusted time gage line opposite the adjusted fuze setting. The range-elevation relation thus determined will work satisfactorily through reasonable transfer limits. The value of *c* opposite the adjusted elevation hairline will also work satisfactorily. The fuze setting read under the adjusted time gage line determined by registration will work satisfactorily in almost all cases. Values of fork and drift will not usually be valid, however.



# 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

## WEST GERMAN FRONT (19 Feb to 18 Mar 45)

At the beginning of the period the Allies held the following front:  
**21st Army Group (Field Marshal Sir Bernard L. Montgomery) on the left—Canadian First, British Second, and U. S. Ninth Armies.**  
**12th Army Group (Gen. Omar N. Bradley) in the center—U. S. First and Third Armies.**  
**6th Army Group (Gen. Jacob L. Devers) on the right—U. S. Seventh and French First Armies.**

The 21st Army Group had on 9 Feb initiated a major offensive along the lower Rhine. The 12th Army Group was engaged in an offensive eastward from the Ardennes region; this had started on 25 Dec in an operation to throw back a German invasion of the Ardennes, and had been waged continuously ever since. The 6th Army Group was engaged only in minor operations.

### THE DUTCH BORDER BATTLES

The front of the 21st Army Group was  
**Schouwen Island (G)—Overflakkee Island (G)—Hollandische Diep—Waal River (with Allied bridgehead at Nijmegen)—Schenkenschanz (?)—Cleve (A)—Goch (G)—Afferden (A)—RR line to Venlo (G)—Maas River—Echt (A)—Sittard (A)—Geilenkirchen (A)—Linnich (A)—Roer River.**

West of Schenkenschanz the front was tranquil. At that point the line turned south; as far as Afferden it was the site of a major attack by the Canadian First Army. Against very strong opposition it had in the past ten days made a maximum advance of 15 miles.

On the 19th a 5-hour artillery preparation started at 0900 hours, after which infantry and tanks attacked toward the Calcar—Goch road. The left gained only slightly, arriving before Moyland; the right reached Goch and started a street and house battle. It took all next day to clear Goch and to make another small advance into Moyland. Since this offensive had started, about 10,000 prisoners had been taken in 12 days. The enemy continued to react vigorously. He frequently counterattacked, using armor in the flat country around Calcar. In heavy fighting the Allies ended the battle in Goch on the 21st and in Moyland on the 22nd. That day the Germans counterattacked toward Goch, but the Allied line held slightly east of that town.

On 23 Feb the Allied left cleared Moyland's outskirts and was in position to advance toward Calcar. The right, directed toward Udem, was only able to make the slight gain. The Canadian attack was supported by the U. S. Ninth Army, which was along the Roer River southward from Linnich. The British Second Army held the line between the Canadians and Americans but did not participate in the battle. On the right of the Ninth the First U. S. Army aided this attack with its left.

At 0245 hours the Ninth Army fired an artillery preparation lasting 45 minutes. The infantry then attacked across the Roer, using assault craft (some of them rubber) and alligators. It was bright moonlight—so bright that the artillery was called upon for a smoke screen, unusual in a night operation. Medium and fighter bombers joined in the attack after daylight. Enemy resistance was limited mainly to artillery and mortar fire. Bridgeheads were established at several places and bridges constructed, the first being ready for traffic before noon. The axis of advance was northeast.

On 24 Feb Gen. Eisenhower, while inspecting the front, announced that the mission of the new attack was "the destruction of the German

forces west of the Rhine." The Canadian First Army, attacking southeast, met very strong resistance and made only minor gains. Our Ninth Army advanced through Linnich to Baal and cleared Juelich, while the First occupied half of Dueren.

Next day the Ninth in the Linnich sector reached Loevenich (east of Juelich) and Steinstrasse; at Dueren the First Army made a 2-mile advance. The Canadians made no gains. On the 26th the Canadians fired a strong artillery preparation before attacking, and this time reached the outskirts of Calcar. Their right was still near Goch. The Ninth Army, using armored troops which leapfrogged the infantry, before dawn reached the line Erkelenz (exc)—Ameln—Ober Embt. The First Army arrived at the Naffer River, 12 miles east of Dueren.

The Ninth Army now had in its front the Erft River. This is a net of small creeks including a canal extending through numerous small marshes. The enemy held a ridge on the far side. In view of this situation attempts were made to pass around the Erft. On the left of the Ninth Army Erkelenz was cleared and the 84th Div then advanced its motorized elements 9 miles due north to north of Wegberg. The center closed in on the Erft. On the right, new First Army troops extended the attack by crossing the Roer to Nideggen. In the north the Canadian First Army, still confronted with heavy opposition, reached Udem.

On 28 Feb Calcar was found to have been abandoned by the enemy during the preceding night. The Canadians occupied it and extended their line facing south along the Goch—Xanten RR. In a hard fight the Ninth Army established three bridgeheads across the Erft; the U. S. First Army expanded the front to the line Norvenich—Vettweiss—Nideggen.

The first day of March saw a very long artillery preparation fired by the Canadian First Army—14 hours. In spite of this only a 2-mile gain was made south of Udem, taking Kervenheim. The Ninth Army sent its armor forward and made considerable gains, reaching the line Muenchen-Gladbach (inc)—Neuss (exc) with its left, while the right crossed the Erft River to the ridge just beyond. The U. S. First Army crossed the Naffer River.

In view of the general situation, the German High Command during the night 1/2 Mar commenced to evacuate the salient whose head was the line Afferden—Venlo—Roermond, withdrawing northeastwardly toward Wesel. The first movements were not perceived by the Allies. In the morning Venlo and Roermond were found empty; the Ninth Army advanced to the line Straelen—Duelken—Viersen—Crefeld (exc)—Neuss.

The Germans confronting the Canadians held in order to cover the withdrawal; thus the Canadian Army succeeded only in reaching the line Weeze—Kervenheim. The right of the Ninth Army met very stiff resistance on the ridge bordering the Erft and made but slight gains. The U. S. First Army advanced to Erp and the Rothbach (Red Creek).

On 3 Mar, the enemy's retreat in the north continuing, the right of the Canadian Army was extended from Weeze to beyond Kavelaer, where it established liaison with the left of the Ninth Army at Geldern. That army extended the line through Sevelen to include Crefeld and Neuss. Its right closed in on Cologne from the northwest; it reached Poulheim, only 4 miles away. The U. S. First Army in very hard fighting arrived at a point about halfway from the Erft to Cologne, due west of that city, while its right arrived on the Rothbach

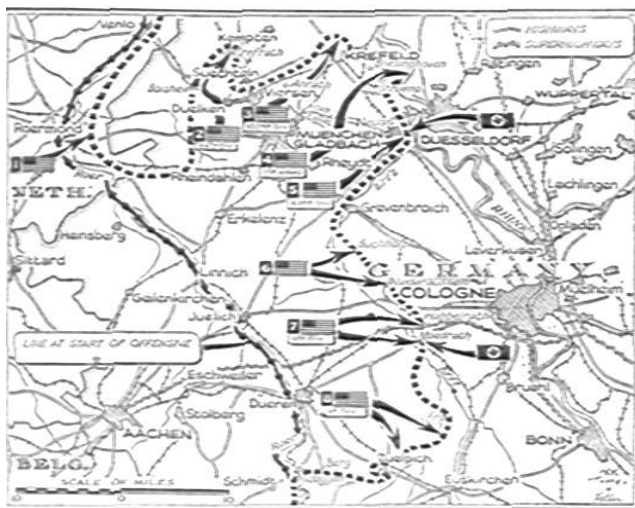
from Lechenich to Zulpich, with bridgeheads across the creek.

Next day the Canadian left met very heavy resistance from hostile forces northwest of Xanten. The right continued to advance, following the enemy's continued evacuation. Including the left of the Ninth Army, the line reached was Marienbaum—Sonsbeck—Capellen—Rheurdt—Moers—Homburg (exc). The U. S. 84th Inf Div advanced on Homburg during the night 3/4 March and ran into an enemy column near Moers en route to across the Rhine. By attacking promptly about 1,000 prisoners, 11 tanks, and 7 guns were captured. South of Neuss the enemy still held the west bank of the Rhine to a shallow depth. Initial penetrations were made this day just north of Cologne, and that city itself was reached. The U. S. First Army extended its attack with its right which, crossing the Roer, captured Schleiden. From there the line ran along the Rothbach to Euskirchen (exc)—Wetterswilt—west edge of Cologne. The enemy was resisting strongly but was moving across the Rhine as quickly as possible.

On 5 Mar the Canadian Army made a determined effort to crush the enemy's right near Xanten. Had this been successful enemy troops still west of the Rhine might have been intercepted, but the attack made little headway before very strong German resistance. The right of the Canadians swung in behind the withdrawing enemy and reached the line Sonsbeck (exc)—Alpen—Rheinberg (exc). The left of the Ninth Army (8th Armd, 5th Armd, and 35th Inf Divs) reached the vicinity of Orsoy. The 2nd Armd and 84th Inf Divs cleared Homburg. From there south the Ninth Army held the west bank of the Rhine, less a few small enemy bridgeheads, as far as Cologne. That city was entered on the north by the 3d Armd Div; the U. S. First Army with the 104th and 8th Inf Divs entered it from the west. Further south troops of the same army captured Euskirchen. The 1st and 9th Inf Divs forced the Erft River and advanced to a line 8 miles west of Bonn.

On 6 Mar Cologne, less a sector in the south, was occupied without much opposition. The Canadian Army closed in, taking Sonsbeck and Rheinberg. The enemy withdrew all bridgeheads north of Cologne except at Wesel and Zons. The First Army closed in on Bonn and on its right advanced to Urft.

Next day the enemy did not withdraw further from his Wesel bridgehead. Instead, he attacked; severe fighting followed. The Canadians held, and advanced to near Veen. All enemy bridgeheads between Wesel and Cologne were taken, leaving the west bank in Allied possession. The enemy opposite the First Army continued to withdraw



*In early March, while some of its forces to the west occupied Roermond (1), the Ninth Army raced after a week of the offensive through Dülken and Boisheim into Grefrath (2) and gained ten miles to win Viersen, Anrath, and the city of Krefeld (3). It reached the Rhine near Boesinghoven (4) and at captured Neuss (5), and was fighting fiercely at the approaches of the bridges crossing to Duesseldorf. The First Army drove into Buchholz and Niederaussem (6) and Habbelrath (7), but was battling counterattacks at Moedrath. The First also swept through Erp and all but ringed Zulpich (8).*

across the Rhine, but they held at Bonn to cover their troops to the south who had greater distances to go to reach the Rhine. These were moving rapidly, for the 9th Armd Div entered Rheinbach by noon and not finding much resistance pushed forward. Its advance elements reached Remagen on the Rhine about 1600 hours. It appears to have arrived about 10 minutes after the tail of the German column had cleared the Rhine bridge, which had been prepared for destruction. Infantry dismounted from carriers and seeing no enemy went over the Remagen bridge to the east bank against light opposition. Other troops then followed. The engineers removed most of the demolition charges in time, then repaired the bridge to permit tanks to cross that same night.

Capture of the Remagen bridge practically intact was unexpected by both sides. The movement over the bridge was initiated by the local commander, subsequently approved and reinforced by each higher commander as the surprising news reached him. The enemy had taken no measures to fight a battle on the east side of the Rhine and had only minor forces present.

Realizing the importance of the crossing, the local German commander during the night 7/8 Mar counterattacked and made a dent in the American lines. As day came fighting followed all around the new bridgehead, resulting in slight American advances as new troops arrived. In the north the Canadians captured the approaches to Xanten after a very hard fight, while the First Army cleared Cologne and entered Bonn to start a street and house battle.

During the night 8/9 Mar the Germans, using two bridges at Wesel, withdrew rapidly from the west side of the Rhine. During the ensuing day the Canadian Army occupied Xanten and Alpen but its attacks failed to advance beyond. The Ninth Army, having reached the Rhine along its entire front, was relatively tranquil. The U. S. First Army completed the street and house battle in Bonn, occupied Bad Godesberg in the south. The Remagen bridgehead was reinforced and expanded to include Erpel. Neither side had as yet strong forces east of the Rhine in this sector.

The enemy completed his withdrawal from his Wesel bridgehead and blew up the two bridges during the night 9/10 March. German artillery arrived to fire against the Remagen bridge. Although the enemy had good OPs overlooking the bridge, his guns failed to destroy it; they did cause casualties and damage, which from time to time interrupted traffic.

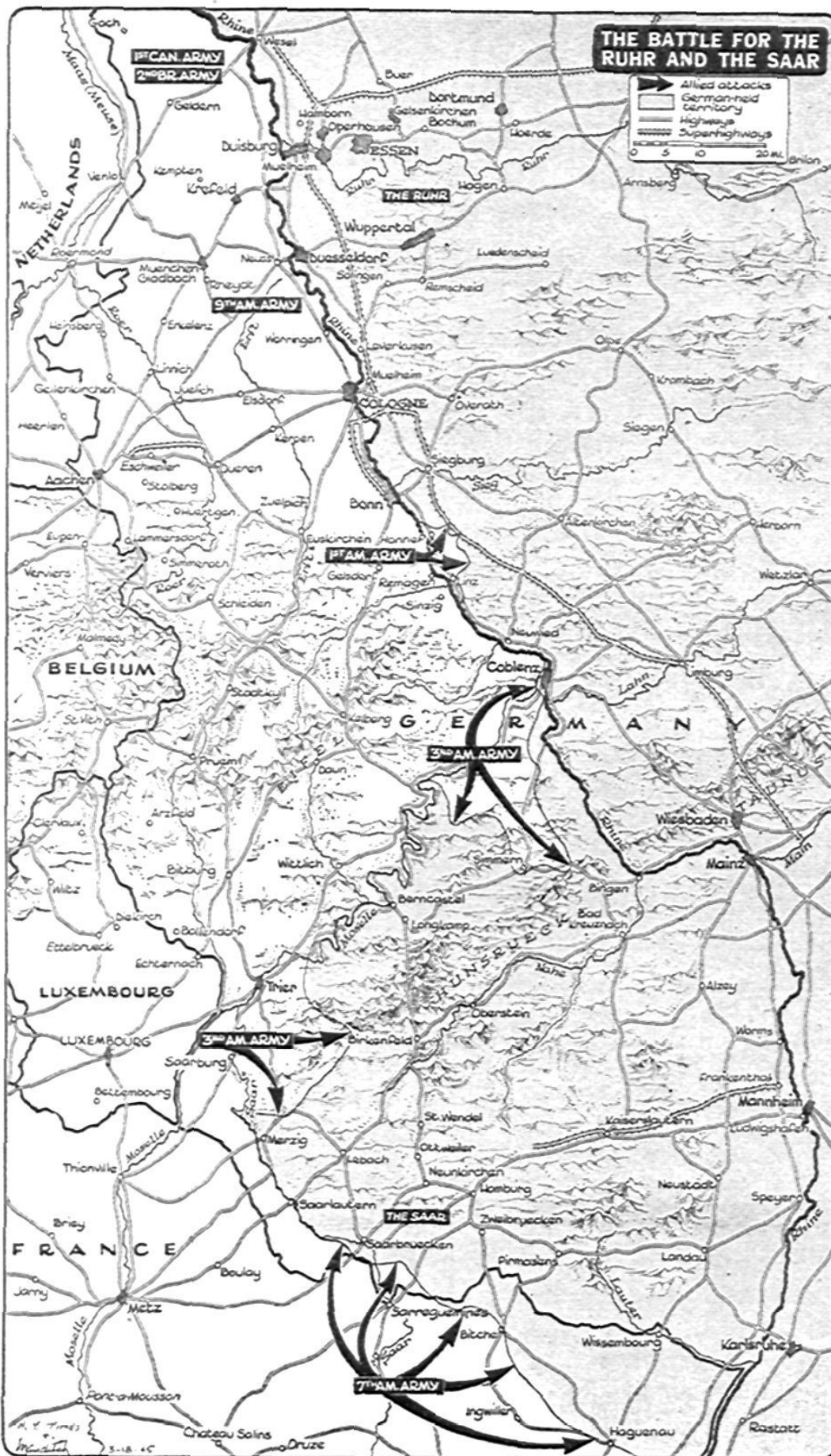
The day of the 10th ended the original battle intended to clear the Dutch border and the lower Rhine. Not initially contemplated, it had led to an entirely new operation—that around Remagen. The battle north of that place had not led to the destruction of the enemy as contemplated in the announced mission. Although the enemy had lost heavily, he succeeded in extricating his best troops and equipment to east of the Rhine. Except for Remagen all bridges over that river were out.

#### THE REMAGEN BATTLE

On 11 Mar both sides had considerable forces in the area. Initial operations were by the Americans, who undertook as a primary mission the capture of the enemy OPs overlooking the bridge site. With this was a general effort to widen the bridgehead in all directions. Best progress was made on the flanks, as it was possible for artillery west of the river to enfilade enemy lines opposing American attacks to north and south. We reached Honnef on the north and Linz on the south. At the end of the day the bridgehead was 9 miles long, with a maximum depth of 3 miles.

On the 12th attacks through Honnef failed, a street and house battle continuing there. On the south Linz was passed and Hoenningen was entered. Most of the enemy OPs were captured; the Remagen bridge was relieved of much harassing fire. Next day fighting was severe. The battles in Honnef and Hoenningen continued, but in the center the line was advanced to enlarge the bridgehead to a depth of 4½ miles. Opening of a pontoon bridge for light traffic relieved traffic over the Remagen bridge. This was still under shell fire and was occasionally attacked by enemy planes who engaged a continuous umbrella of Allied fighters maintained all day every day.

On 14 Mar the battle to enlarge the bridgehead was continued. Enemy troops were arriving continuously. Resistance was increasing.



Counterattacks were frequent. The German artillery damaged the Remagen bridge sufficiently to stop traffic, but the bridge was later reopened by the engineers. By evening the line was approximately Honnef (A)—hill 359 (the Leiberg) (A)—hill 441 (the Asberg) (?)—Kaltenborn (G) — Notscheid (G) — Hargarten (A)—Hoeningen (street and house battle).

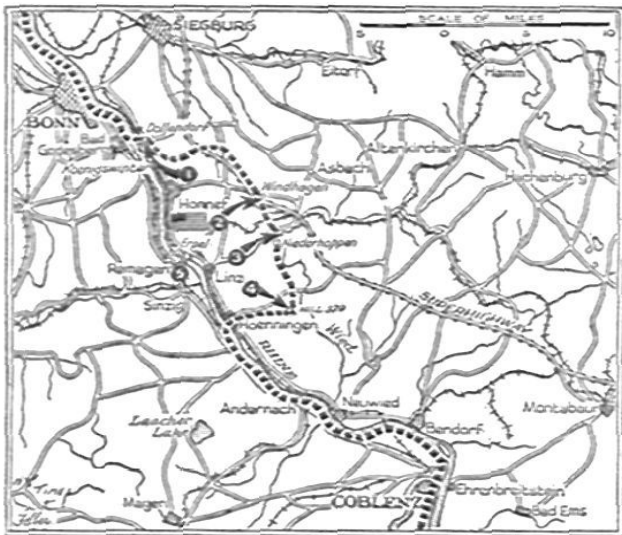
On the 15th the attack along the Rhine to the north captured Rhoendorf. In the south Hessel (south of Hargarten) was occupied. Attacks to north and south were facilitated by American artillery fire from the west side of the Rhine. With this aid Rhoendorf was cleared next day and the line advanced into Koenigswinter on the north. The battle in Hoeningen continued through the 17th, when that small town was finally cleared of the enemy. On this day the Remagen main bridge span failed while engineers were working on it. It had been weakened on 7 Mar by demolition charges which had not been removed, and by shell hits on succeeding days. A pontoon bridge had already been laid, and new floating bridges were started without delay.

By 18 Mar the line reached Dollendorf (A) — Bruengsbereg (G)—Windhagen (?)—Lorscheid (A) — Neiderhopp (A)—hill 329 (A) — Hoeningen (A).

The bridgehead was about 8 miles deep by 15 miles long.

**THE BATTLE OF THE EIFEL**  
 Eifel is a German district adjoining the Ardennes to the east. It lies on the north side of the Mosel (or Moselle) River, west of the Rhine and east





*Further expanding the Remagen bridgehead, First Army troops drove into Dollendorf (1), took an airfield south of Windhagen (2), crossed the Wied River near Niederhoppfen (3), and captured Hilt 329 east of Hoenningen (4). The bridge at Remagen (5), our original road across the Rhine, collapsed.*

of Luxembourg. It is hilly and wooded. The higher hills, known as the Hohe Eifel, are in the east and range from 2,000 to 2,400 feet high. This is an old volcanic region and old cones, nearly perfect in form, are scattered around. There are numerous small lakes known locally as *maare*, or crater lakes. They do not lie in old craters, however, but on sites of prehistoric explosions. South and southeast of Daun is a group of these lakes which include Pulvermaar, known for its beaches of a black sand which appears as a black powder in the water.

The Eifel is full of small towns. In the east the stream lines run northeast into the Rhine; elsewhere, south or southeast into the Mosel Roads and railroads correspond to the water system, as a rule following the valleys.

At the beginning of the period the U. S. Third Army was holding the line

**Roer River—Gemuend (Allies)—Hellenthal (A)—Losheim (A)—Pruem (A)—Leidenborn (G)—Neuerburg (G)—Vianden (G)—Sauer (Sure) River—Wasserbillig (G)—Mosel River—Nennig (A)—Merzig (G)—Saar River.**

On 19 Feb there was fighting between Pruem and the Sauer River, and near Nennig, with slight advances for the Americans. On the 20th a new operation was started to clear the triangle between the Mosel and Saar Rivers. At 0200 hours an infantry division crossed the Mosel north of Remich. There was no artillery preparation. The enemy appeared to have been taken by surprise. The attacking forces moved onward to a line through Wincheringen. The 94th Inf Div attacked north from the area west of Merzig and after considerable fighting entered Freudenburg. Armored troops closed the gap between the two infantry divisions occupying Meurig and Kirf. Gains of 1 to 2 miles were made south of Pruem, including the capture of Obersgegen, in a general advance intended to straighten out the front by advancing it to along the Pruem River.

On the 21st the advance toward the Pruem River continued meeting heavy resistance everywhere. Near Saarburg strong attacks were made to capture that city and clear the area between the Saar and the Mosel. Against strong opposition the line was advanced to 3 miles from Saarburg.

Next day the triangle between the rivers was cleared, the enemy withdrawing, and the west bank of the Saar was solidly held southward from its mouth. Armored troops made a start to turn the enemy's position about Trier by an enveloping movement from the south. They were able to establish two small bridgeheads about 2 and 4 miles south of Saarburg. In the north Vianden (the last enemy-held territory beyond Germany in this sector) was taken, and further slight

advances were secured toward the Pruem River south of the town of the same name.

On 23 Feb the slow eastward advance toward the Pruem River continued against continued resistance. Better gains were made in the south, where crossings of the Saar River were enlarged south of Saarburg and a new one was started just north of that city. All these gains were slightly enlarged next day.

On the 25th the Pruem River was reached 5 to 7 miles above Echternach and was crossed by the 76th Inf and 4th Armd Divs, who in places advanced 2 miles beyond. The Saar bridgeheads met fresh enemy troops who attacked. In spite of this the north bridgehead was expanded to 2 miles in both width and depth, and the south one to 4 miles in width and 2 in depth.

On the 26th considerable progress was made in the Saarburg area, both bridgeheads being substantially enlarged and joined. Troops arrived 5 miles east of the Saar. The attack across the Pruem River made progress, but was stopped by a counterattack which prevented the seizure of Bitburg by joint operations from the north and south.

Bitburg was entered the following day, however, when further advances of about a mile were made in the Saar bridgeheads. The enemy withdrew from Wasserbillig.

On the last day of the month the direction of attack from the Saar bridgeheads was changed to northward toward Trier, less than 6 miles away. At the same time the troops who had crossed the Pruem River in its lower reaches cleared Bitburg, arrived on the Kyll River which was just beyond, and faced toward Trier (7 miles to the south). There was heavy fighting with main effort being made to capture Trier.

On the first day of March, the American line being then substantially along the Pruem River, the attack was extended north of that town for a distance of 9 miles. South of Pruem the attack was continued toward the Kyll River. The main fighting, and very severe, was around Trier. On the south side the 10th Armd Div arrived on the road on the right bank of the Mosel northeast of the city and from there reached the suburbs. On the north side the 76th Inf Div closed in to about 2 miles from Trier.

The hard battle continued on the next day, during which the enemy was forced out of Trier. On the 3d the American positions were consolidated; they extended on the north to the Kyll River near its mouth and in the vicinity of Pruem to the Nims River.

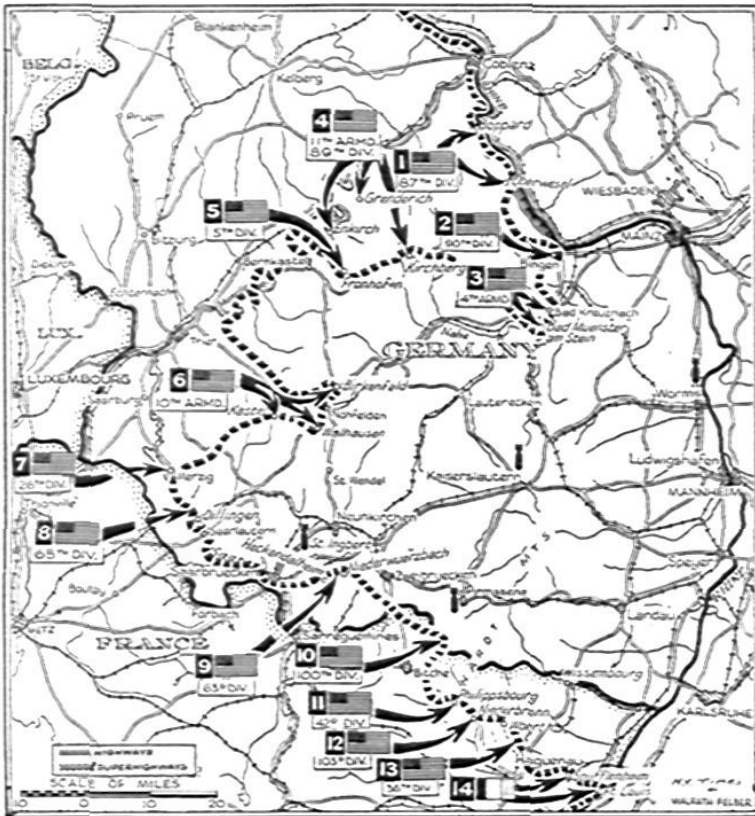
On 4 Mar the main effort was changed to driving straight forward through the Eifel. The Trier and Saarburg area was held against enemy counterattacks opposite Saarburg. North of Trier the Kyll River was crossed near Bitburg; opposite Pruem, Budesheim was reached. The Kyll was reached generally next day.

On 5 Mar the 4th Armd Div, in line east of Bitburg, broke through the hostile lines on a narrow front and started for the enemy's rear areas. It met surprisingly little resistance and advanced to the vicinity of the crater lakes south of Daun. Next day it crossed the Uesser River, still finding only small enemy forces, and advanced on Mayen. This was found strongly held. As the division was far ahead of supporting troops and with the enemy on all sides, it withdrew a short distance. At nightfall of the 6th it was in the vicinity of Kaisersesch. In the meantime the infantry divisions in the rear, still meeting steady resistance, arrived along the north part of the Kyll River and crossed it in the south.

In order to exploit the gains of the 4th Armd Div and to support it, next day the 11th Armd Div leapfrogged the 90th Inf Div along the Kyll and, advancing rapidly, arrived in the left rear of the 4th Armd Div near Dreis. The 4th bypassed Mayen on the south and reached the Rhine River northwest of Coblenz. The infantry divisions continued their slow advance beyond the Kyll, arriving at Herforst in the south.

On 8 Mar the 11th Armd Div reached the area of Boos, 9 miles west of Mayen, while the 4th Armd Div remained on the Rhine, not finding any enemy. The infantry divisions arrived on the Kyll at Leuersdorf on the north; at Neroth (west of Daun) in the center; and at the Salm River on the south.

Next day the 11th Armd arrived at Brohl on the left of the 4th Armd, which captured Mayen and Andernach. A strong position



At the period's end, south of Coblenz troops of the Third Army gained the bank of the Rhine between Boppard and Oberwesel (1) and drove into Bingen (2). Armored units crossed the Nahe River at Bad Kreuznach and at Bad Muenster-Amstein (3). Another armored spearhead advanced on Kirchberg, while infantrymen following it up took Enkirch and Grenderich (4). Fronhofen (5) also fell. Southeast of Trier our troops took Birkenfeld and were near Walhausen and Kastel (6). Merzig (7) was captured and to the south infantrymen crossed the Saar River a mile north of Dillingen (8). Troops of the Seventh Army reached Heckendalheim and Niederwuerzbach (9) and crossed the Reich border seven miles northeast of Bitche (10). Phillipsbourg (11) and Niederbronn (12) were taken and three villages northwest of Haguenau were cleared (13). French units seized Soufflenheim and reached the edge of Fort Louis on the Rhine (14). Bomb devices indicate key points that were attacked from the air.

was thereby established along the Rhine, blocking all enemy roads out of the Eifel to east of the Rhine. It was hoped to enclose and capture this hostile force. The infantry divisions, always against opposition, made small gains to the east.

On the 10th the armored divisions expanded their zone to around Mayen. The infantry divisions moved slowly forward and in the south captured Wittlich. In view of the outstanding success of the armored divisions, the enemy decided to evacuate the Eifel. As roads across the Rhine were blocked the withdrawal was mostly south across the Mosel. To protect this movement it was essential that no American advance be permitted south of the Mosel from the Saarburg bridgehead. At this time the furthest American troops south of the Mosel were at Fell, 7 miles east of Trier.

On 11 Mar the armored divisions worked backward. Without meeting much opposition they occupied the north bank of the Mosel from Coblenz (exc) to Cochem (inc). The infantry divisions closed up on the Lieser River and to the north crossed it to reach Gillenfeld in the crater lake district. In the south a German counterattack recaptured some ground near Uerzig, thereby leaving the Mosel crossings east of that place open for further withdrawals after dark to the south side of the Mosel.

Next day the armored divisions, still working backward, cleared enemy detachments out of the area about Lake Laacher, the largest of the volcanic lakes. It was impracticable to advance west from Cochem

along the Mosel. The infantry divisions made a new attack and this time held their ground across the Lieser River at Uerzig. An effort was made to advance from the Trier area south of the Mosel; a 1-mile gain was made near the river. Further south an enemy attack recaptured ground and arrived within 5 miles of Trier, and almost due east near Walbach.

On 13 Mar the enemy's hold along the Mosel was reduced to a 4-mile stretch about Bullay. A hostile attack east of Trier was stopped. Further south Americans advanced east and southeast from the Saarburg area to a line through Nieder Zerf and Greimerath. A further advance was made on the 14th, while the north bank of the Mosel was now practically clear of German troops.

This ended the Eifel battle, which had cleared that country of the enemy. It had not succeeded in capturing organized enemy units. Nevertheless the enemy lost heavily in personnel, and his terrain losses were serious.

#### THE BATTLE IN NORTH ALSACE

On 19 Feb the U. S. Seventh Army held the line Saar River—Forbach (G)—Alsting-Zinzig (G)—Gross Blittersdorf (G)—Bliesbruck (G)—Rimling (G)—Betwiller (?)—Lambach (A)—Wingen (A)—Model River—Rhine River. Minor fighting was in progress near Forbach, and the Americans reached Octing and Etzling on the east of Forbach. This was continued on the next day and on the 21st, when Forbach was reached and a street and house battle began. At the same time the attack was continued east of Forbach toward Saarbruecken.

The battle in Forbach, a town of about 12,500 people, continued until 5 Mar. On the same date, northeast of the town Stiring-Wendel and the adjacent wood were cleared. The fighting spread to west of Forbach without much change in the line prior to the 14th, when a new operation was commenced.

#### THE PALATINATE BATTLE

The Palatinate occupies the better part of the triangular area between the Mosel River on the northwest, the Rhine River on the east, and Alsace on the south. It is divided by the Hardt Mountains into east and west sections. The east section is flat, open, fertile country; the west section is rough.

The American attack was by the Seventh Army attacking north from Alsace while the Third Army struck south across the Mosel close to its mouth with a view to cutting off the enemy from escaping across the Rhine. It seems probable that the enemy, foreseeing some such maneuver, had already commenced to evacuate the area as early as 12 Mar.

On the 13th an attack was made on Haguenau. The Moder River was crossed and a bridgehead established. A street and house battle was started to clear the entire town. The enemy, suspecting an attack west of the Hardt Mountains, increased his artillery fire on what he thought were probable American assembly areas.

On 14 Mar an attack was launched west of Forbach on a 5-mile front which advanced 3 miles to the Saar River just west of Saarbruecken. At Haguenau German attacks were repelled and the street and house battle continued, while between Forbach and Haguenau a continuous heavy attack was delivered. This did not make any considerable advance. On the north the Third Army, under a dense smoke screen, forced a crossing of the Mosel northeast of Cochem and established a bridgehead. This was extended next day against only moderate resistance to a width of 9 miles and a depth of 6. The Seventh Army attacked along the entire front, meeting strong opposition. An attack on Saarbruecken failed to enter that town. To the east progress of about 3 miles was made to Habkirch and Uttweiler. An attack launched eastward reached Schorbach, which was north of the Maginot Line fortifications. Along the upper Moder that river was crossed and Offwiller reached. The battle in Haguenau continued.

On the 15th three major attacks against the Palatinate were in full progress. The Third Army forced a crossing of the Mosel River near its mouth, the 4th and 11th Armd Divs leading the advance. Meeting only moderate resistance, it advanced about 6 miles south parallel to the Rhine. The same army attacked southeast from the Trier area, while the Seventh Army attacked northeast between Saarbruecken and the Rhine. The latter met severe resistance and made but moderate gains. From left to right, infantry divisions in line were the 70th, 63d, 100th, 42nd, 103d, 36th American and the 5th Armd and 3d Algerian French Divisions.

On 16 Mar the attack south along the line met enemy armor, but American armor brushed this aside in a number of small battles and by evening reached the line Simmern (inc)—Soon Forest (exc)—Boppard (exc). Infantry divisions extended the attack of the armor by crossing the Mosel in the Bullay sector. The center from the Trier area arrived close to Merzig, while the Seventh Army made additional small gains on the south. Coblenz was entered.

On the following day the Third Army's two armored divisions reached the Nahe River, with the 5th, 90th, 89th, and 87th Inf Divs mopping areas in rear. The center attack, led by the 26th, 94th, and 65th Inf Divs and spearheaded by the 10th Armd Div, reached the line Merzig (exc)—

Losheim (inc)—Wadern (inc). The Seventh Army on the south found the enemy retreating and gained substantially, reaching a line about 7 miles north of and generally parallel to that held on the 15th.

By 18 Mar, except for isolated spots the attack south along the Rhine had cleared that river as far as the Nahe River. This same stream was reached by the center attack near Birkenfeld. The line reached extended west from there to Dillingen on the Saar River. The Germans held a pocket north of the Nahe between the two Third Army offensives. On the south side the Seventh Army met considerable resistance, especially on its left and center, where the West Wall had to be crossed. On the right the fighting was in the Maginot Line, which faced the wrong way for the enemy but still was of considerable use to him. The line reached by the Allies was

**Saar River—Saarbruecken (G)—Zweibruecken (G)—Walshbronn (G)—Ludwigswinkel (A)—Sulz (A)—Hatten (A)—Beinheim (A).**

The enemy was retreating out of the Palatinate to east of the Rhine as rapidly as possible. His movements were harassed day and night by constant attacks by the Allied Air Force. The early fall of the entire enemy holdings west of the Rhine was in sight.

## EAST GERMAN FRONT (19 Feb to 18 Mar 45)

At the beginning of the period the great Russian winter offensive, which had started from east of Warsaw on 12 Jan, had made its maximum advance (on a direct line to Berlin) by its arrival on the Oder River between Kuestrin and the mouth of the Neisse River. This line had been reached at the end of January without major battles.

The Russian flanks trailed to the rear. The north one extended 300 miles to East Prussia, the south one 300 miles to Slovakia. Both were bent back at angles of about 45°. Both were engaged in heavy fighting. The main Russian effort has been on the flanks, there having been little change in the center and no advance toward Berlin. The major mission of the north flank has been to capture one or more ports, and very strenuous efforts have been made to accomplish this. Both flanks have endeavored to advance to the line held by the center. On the north this was the Oder River; on the south, the Neisse River.

During the winter Russia has had no port available south of Estonia. She held Riga, but the Germans blocked the sea channel by their batteries in their Latvia beachhead. Ventspils and Liepaja were within the same beachhead. Memel was in Russian hands but had been destroyed by the enemy. The ports of Koenigsberg, Danzig, Gydnia, Kolberg, and Stettin were in German possession.

If these ports could be taken the German Navy which dominated the Baltic Sea might be driven out of it for want of bases. This would open that sea to Russian ships and facilitate supply of her large armies in east Germany, which were very far away from their depots.

To advance further into Germany a base of sufficient width and appropriate lines of supply were essential. The front opposite Berlin was only 45 miles from that city, but it was only 40 miles wide—too small for a major offensive. An extension of this front to Stettin on the north and to Goerlitz on the south would give a front of about 160 miles in an air line. This would suffice for a new operation aimed for as far as the Elbe River, 50 to 100 miles away. It would permit an option of attacking Berlin or bypassing it.

The right flank of the Russian armies was covered by the Baltic Sea and could not well be enveloped by the enemy. But the left flank in upper Silesia was open to envelopment by hostile forces emerging through the passes of the Carpathian Mountains. To check this danger a secondary operation south of the Carpathians was undertaken.

On 19 Feb Russian Army Groups were disposed as follows:

- 1st Baltic:** opposite the Latvia beachhead on the line Lielupe River—Dobele—Saldus—south boundary of Latvia to the Baltic Sea. *Mission:* to reduce the beachhead and thereby open the ports of Riga, Ventspils, and Liepaja.
- 3d White Russian:** in East Prussia. *Mission:* capture and open the port of Koenigsberg.
- 2nd White Russian:** opposite Danzig. *Mission:* capture and open Danzig and Gydnia.

**1st White Russian:** on the Oder River opposite Berlin. *Mission:* hold on the left; with the right, extend along the Oder to the Baltic Sea.

**1st Ukraine:** in Silesia, nearly parallel to but over the Oder River. *Mission:* advance to the Neisse River.

**4th Ukraine:** astride the Carpathian Mountains. *Mission:* advance west, covering the left of the 1st Ukraine.

**2nd Ukraine:** in Hungary, east of the Danube and south of Slovakia. *Mission:* attack north, thereby facilitating the advance of the 4th Ukraine by enveloping enemy's right.

**3d Ukraine:** in Hungary, west of the Danube and north of the Drava River. *Mission:* cover the left of the 2nd Ukraine against an enemy advance east through Budapest.

### OPERATIONS OF THE 1ST BALTIC ARMY GROUP

On 19 Feb the 22nd Russian Army was engaged in an attack to pierce the center of the Latvia beachhead line in the vicinity of Saldus and thereby split the enemy in two. Next day this attack was extended to the entire front; very severe fighting developed, and continued until the 28th. No substantial gain was made. This was the fifth attempt since last November to capture the beachhead, and like the preceding ones was practically a failure. According to German reports the Russians since the 19th had lost 19,000 killed, while 301 tanks had been destroyed.

After changing divisions in line, the Russians on 3 Mar renewed their offensive between Liepaja and Saldus. This battle lasted until the 14th, when it was discontinued after the same result as before—no substantial change in the situation.

### OPERATIONS OF THE 3D WHITE RUSSIAN ARMY GROUP

This Army Group had 7 armies, and was engaged in attacking a German Army based on Koenigsberg. The Germans held the line Fischhausen—Koenigsberg—Kreuzburg—Zinten—Mehlsack—Braunsberg (all inc). The sea was open to the Germans. Their naval ships gave powerful support to operations within range of their guns.

On 19 Feb the Germans were on the offensive north of Koenigsberg, with the mission of improving and safeguarding their line of communications to Pillau and thence to Danzig by the narrow peninsula north of the Frisches Haff. The Russians were on the offensive south of Koenigsberg with a view of seizing that city from that direction. Both offensives made progress. These twin battles continued uninterruptedly until the 28th. By that time the Germans had advanced their line north of Koenigsberg to Palmnicken and Drugehnen, thereby establishing a satisfactory line of communications to Pillau. The navy substantially aided this success. On the south side the Russians—with one additional army in line, making 8 in all—advanced their line to west of Kreuzburg.

On 1 Mar the Russians attacked the line Zinten—Kreuzburg from the south. After making slight gains on the 2nd a regrouping was

made and the attack renewed on the 4th with further small gains on the 5th. These were partially lost next day to a counterattack, and the offensive was temporarily discontinued. The Germans claim that since mid-January when the Russian offensive started—about 7 weeks—the Russians in the Koenigsberg campaign had lost 275,000 men in casualties and over 1,700 tanks and 2,100 guns. There are no Russian figures. The tank loss alleged is not extraordinary for 8 armies in a 40-day contest—in fact, it appears to be below the average for a modern battle. The gun loss presumably includes self-propelled guns and is not much over normal. Germany now changed the commanding general at Koenigsberg, replacing General Mueller with Colonel General Rendulic, transferred from Finland and north Norway.

A new Russian attack was launched 13 Mar along the line Lichtenfeld—Zinten—Perwilten, a 20-mile front. More than 20 infantry divisions supported by armored battalions were used. A hard battle brought slow but steady Russian gains. The Germans frequently counterattacked and yielded nothing without a fierce fight. On 15 Mar the Russian attack was extended by an operation eastward along the lagoon coast starting from just west of Braunsberg. On this date the Russian right captured Perwilten and reached the coast about 5 miles from Koenigsberg. A defensive front was established toward that city, and an offensive front to attack westward along the coast. The main German force southwest of Koenigsberg was now surrounded and subject to a concentric attack. On the 16th the Russians passed beyond Zinten to within 6 miles of the coast. On the 17th Brandenburg was taken. By a night attack 17/18 Mar the Russians forced the Frisching River, just below Brandenburg, and during the ensuing day reached Ludwigsort. On the opposite flank Vogelsang was reached. As this account closes the Germans had been reduced to a beachhead 20 miles long and 5 to 7 miles deep.

#### OPERATIONS OF THE 2ND WHITE RUSSIAN ARMY GROUP

On 19 Feb the line was

**Nogat River—Vistula River—Nowe (G)—hill 440 (R)—Tuchola (R)—Chojnice (R).**

The Germans held Grudziadz as a road block in rear of the Russian front. It was under siege. The Russians were attacking north between

Tuchola and the Vistula River, with the mission of capturing the ports of Gydnia and Danzig.

This is rolling country, with numerous forests, lakes, and streams and some swamps. On the 20th the Russians reached Szlachta and next day Skurcz. On the 24th, progress being slow, the front of the attack was extended to west of Chojnice, practically along the railroad to Linde. The axis of this attack was northwest. A powerful artillery preparation was fired but it was not until the following day that a gap was punched through the German front, at Preussische Friedland. On the 26th Russian armor followed by infantry in trucks pushed through the gap and entered German rear areas as deep as the vicinity of Bublitz—Rummelsburg. The attack east of Chojnice was repulsed.

The Russian armored force had strong fighter cover, which scouted and guided their movements. Avoiding places ascertained to be strongly occupied, tank spearheads pushed ahead. The Germans brought up infantry from both flanks. By the time these arrived the Russian armor had passed on but following infantry were intercepted. The Germans built up a wall through Bublitz and Rummelsburg, which left the Russians a 15-mile-wide corridor to their forward armor. German attacks stopped the armor slightly beyond the Bublitz—Rummelsburg line, but the wall on the west side of the Russian corridor gave way to incessant attacks and the Russians reached Neustettin on the 28th.

The Russians shifted their main effort to the Neustettin area. Again they punched a hole in the opposing front and sent their armor through. Some arrived northwest of Bublitz on the 2nd but did not stop there: they kept on and reached the vicinity of Koeslin and Schlawe on the 3d. On the same day Rummelsburg was taken and the Russian infantry advanced beyond to Pollnow. East of Chojnice the attack was renewed and reached Lipienice on the 5th and the vicinity of Starogard on the 6th. A front was now established extending from the Baltic Sea on the left south of the Stolpe River and Starogard to near Gniew, encircling the German ports. A new success was the fall of Grudziadz the same day, thereby clearing useful lines of supply. Starogard and Gniew were taken on the 7th.

On 8 Mar the Russians shifted their main effort to their center. Once more the artillery opened a passage due north from Czersk, through which armor penetrated all the way to Kartuzy. The Russian left closed on the Stolpe River and crossed it at Stolp on the 9th.

Next day the Russian attack was further extended east of the Vistula. Tiegenhof was captured. The Germans withdrew their right and the Russians occupied Lauenburg. On the 11th the Germans further withdrew to a line Wejherowo—Zukowo—Tczew—Tiegenhof. Of these places Wejherowo and Tczew were lost next day and Zukowo on the 16th. Strong Russian attacks failed to pierce the German line, which rested partly on previously prepared fortifications.

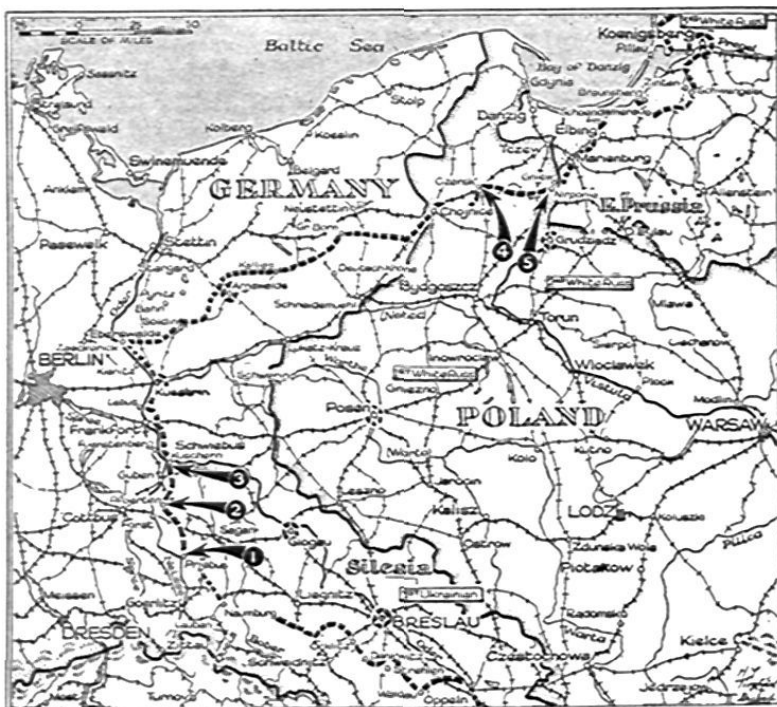
At the end of the period the line was Hallerowo (Russian, with Germans holding the peninsula of Hel)—Puck (R)—Wejherowo (R)—Hill 758 (G)—Zukowo (R)—Tczew (R)—Tiegenhof (R).

#### OPERATIONS OF THE 1ST WHITE RUSSIAN ARMY GROUP

On 19 Feb the line was

**Linde (R)—Jastrow (R)—Kallies (R)—point 5 miles north of Arnswalde—Pyritz (G)—Baerwalde (R)—Oder River (with German bridgeheads at Kuestrin and Frankfurt; and Russian bridgehead south of Kuestrin) as far as the Bober River.**

The mission of this Army Group was to seize the territory north of the Warthe River as far north as the Baltic Sea and west to the Oder River. The Germans held Poznan and Arnswalde as road blocks in Russian rear areas. Both were under siege; Poznan fell on 23 Feb, Arnswalde soon after. In this case the garrison appears to have escaped.



*Soviet forces early in the period reached the Neisse River at two points: Prieubis (1) and Kuschern (3). Between these places they captured Pfoerten (2) on the way to the strongpoint of Forst and to Cottbus. Below Danzig the Russians occupied the junction of Czersk (4) and the town of Nirponie (5).*

On 26 Feb the Russians attacked on a 25-mile front between Pyritz and Arnswalde. German GHQ considered it a holding attack in view of what appeared to be more serious operations to the east against Danzig. The Russian attack was increased gradually. On the 28th tanks reached the Ihna River and some crossed it. Advancing steadily forward, by 2 Mar the leading Russian armor was between Stargard and beyond Jacobshagen. Through identifications the Germans had by now ascertained that this Russian attack was spearheaded by two armored armies. These advanced rapidly. Strong infantry appeared in their rear. On 4 Mar the infantry divisions after considerable fighting reached the line Pyritz (R)—Stargard (R)—Freinwalde (R)—Dramburg (G). The armor had gone through a gap and made a rapid advance against light opposition through Regenwalde to Kolberg (exc). Swinging to their left and striking with vigor, the Russians on the 5th reached the line Stargard (R)—Massow (R)—Naugard (R)—Plathe (G)—Greifenberg (G)—Kolberg (G). The Germans east of Dramburg concentrated in the area about Klorberg; those to the west established bridgeheads around Stettin and Cammin-Dievenow at the mouth of the Oder.

In connection with the operations of the 2nd White Russian to the east, the Germans had been cleared out of Pomerania (less isolated posts) in a 10-day campaign.

On 6 Mar the Russians attacked along the Oder between Frankfurt and Kuestrin. These failed. Further north, however, the outer Russian flank reached the German bridgehead at Cammin and the entire coast thence to Kolberg, which was isolated. The Germans who had assembled near Klorberg lost their rear guard but the main body moved west toward Cammin.

The German force from the Klotberg area succeeded in fighting its way back it reached the beachhead at Dievenow on 11 Mar. Thereafter, until 18 Mar, the Russians attacked the German bridgeheads at Stettin and Dievenow but without taking them. They captured Kolberg on the 18th. In the meantime the attacks along the Oder further south captured the German bridgehead at Kuestrin on the 12th, but Russian attempts to enlarge their bridgehead on the west bank and to establish new ones failed.

At the end of the period the 1st White Russian Army Group had practically accomplished its mission.

#### OPERATIONS OF THE 1ST UKRAINIAN ARMY GROUP

Front line of this army group on 19 Feb was

**Krossen (G)—Sommerfeld (G)—Sorau (G)—Lauban (R)—Goldberg (R)—Kanth (R)—Strehlen (G)—Brieg (R)—Oder River—Ratibor (?)—Strumien (?)—Bielsko (R).**

The Germans held Glogau and Breslau as road blocks in rear of the Russian lines. Both were under active siege. Main effort against Breslau was from the south.

On 19 Feb the Russians were attacking on their right toward the Luebst River, and on their left toward the Sudeten Mountains. They captured Krossen and reached the Neisse River near Guben on 22 Feb, some troops crossing the river. To the south gains were made southeast of Lauban. Heavy fighting occurred between Ratibor and Strumien, without material change in the situation. By the 24th the Russian advance reached the Katzbach Mountains. By the 25th the Neisse River had been reached from its mouth as far south as Priebus, with a few bridgeheads on the west bank and some German ones on the east bank.

On 1 Mar the Germans had been pressed back to the Katzbach Mountains—Eulen Mountains line, but were holding in the foothills. The Russians were advancing around the north side of Lauban toward the Neisse but they lost bridgeheads to the north and were generally unable to cross that river. The Germans commenced a series of small counterattacks with limited objectives to improve their front and if possible drive the enemy back. First gains were in the vicinity of Lauban (5 Mar) and around Guben, a German bridgehead (on the 6th). On the 7th Lauban was recaptured. On the 9th a German bridgehead about Forst was expanded. Striegau was retaken on the 12th.

On 15 Mar a Russian attack was launched south southwest through Grottkau following a powerful artillery preparation. This attack reached the vicinity of Neisse on the 17th.

On the 18th the Russian advance reached the vicinity of Neustadt. Then powerful German counterattacks struck the Russian flanks near Neisse and Leobschuetz and stopped the advance.



*Resuming its offensive to wipe out the German pocket in East Prussia (1), the Red Army threatened late in the period to split the enclave by taking Lank (A on inset) and, farther south, advanced to Hanswalde and Vogelsang station (B). At captured Kuestrin (2) Moscow unofficially reported a crossing of the Oder River toward Berlin. A continued Russian push toward the strategic Moravian Ga? (3) was reported by the Germans. To the south the Soviet drive west of the Hron River swept up Zvolen and Banska-Bela (4). Meanwhile a heavy tank battle east of Lake Balaton (5) raged on. On the Yugoslav border the Germans had had two bridgeheads over the Drava southeast and southwest of Siklos (6).*

#### OPERATIONS IN SLOVAKIA

On 19 Feb the 4th Ukrainian Army Group held the line **Skawa River—Novy Targ (R)—Poprad (R)—Slovakian Mountains south of the upper Hron.**

while the 2nd Ukrainian Army Group continued it to **Detwa (G)—Zvolen (G)—Banska Stiavnica (G)—Pukunec (?)—Levice (or Leva) (R)—Hron (or Garam) River to the Danube (with Russian bridgehead just north of the Danube).**

On 19 Feb both Russian Army Groups were attacking toward Zvolen, respectively from the east and south, while a German offensive was under way against the Hron bridgehead. The area around Zvolen is rough mountains with elevations around 4,000 feet. They are covered with forests, and at the time were snow covered. Operations were difficult.

The Germans completed their offensive on 24 Feb, when the last of the Russian Hron bridgehead was eliminated.

On 2 Mar the 2nd Ukrainian extended their attack to south of Banska Stiavnica. At the same time the attack against Zvolen was intensified. By 6 Mar the Russians had reached mountain positions between Banska Stiavnica and Zvolen. A new operation was started westward astride the Tetry Mountains, north of the Vah valley. On the 10th the Russians reached the east edge of Zvolen. They cleared it two days later, but were unable to cross the Hron River until the 18th, on which day a small bridgehead was won just across from Zvolen. At that date Banska Stiavnica had also been taken. The line then was

**Skawa River—Nowy Targ—Zakopane (?)—Vazec (?)—Brezno (R) Zvolen (R)—Banska Stiavnica (R)—Levice (R)—Hron River.**

#### OPERATIONS IN HUNGARY

The 3d Ukrainian Army Group, with a defensive mission, held the line

**Esztergom—Feloegalla—Szekesfehervar—Lake Balaton—Smogyszob —Barcs—Virovitica—Slatina—Brod.**

German GHQ undertook a major operation involving an attack north across the lower Drava, in coordination with an attack south from the Szekesfehervar area, to clear Hungary west of the Danube. A holding force was provided to prevent the Szekesfehervar attack's being taken in rear.

Preliminary operations were clearing the south side of the Drava River as far east as Valpovo. This does not seem to have met much opposition. The north bank of the Drava was guarded by the Bulgar First Army, with attached Russian troops.

The main attacks were launched on 5 Mar. Very little information has arrived concerning these attacks, neither side giving a clear account. On 6 Mar the Germans got two bridgeheads over the Drava, opposite Donji Miholjac and Valpovo. These were immediately attacked by the Bulgars. The Germans failed to reach Siklos. On 8 Mar the Germans attacked east from the northeast and southwest tips of Lake Balaton, with main effort north of the lake; both attacks had some success. By 10 Mar the Germans across the Drava were stopped but they held their bridgeheads against constant Bulgar assaults. The

north attack was astride the Sarviz Canal and was advancing south. The center attack south of Lake Balaton also made progress eastward.

The German attacks from south and north of Lake Balaton continuing to make gains, the Russians commenced a counteroffensive on 15 Mar westward around the north end of Lake Velence (or Velenceita). New day this was extended to the south side of Lake Velence. The Russians requested and received the aid of the U. S. 15th Air Force in Italy, which heavily bombed German lines of communication. On the 17th the Russian counteroffensive was extended on the north to the vicinity of Feloegalla. South of Lake Velence the Russians arrived close to Szekesfehervar.

On 18 Mar the Russian attack was continued with its main effort an attempt to encircle Szekesfehervar on the north side. It advanced but failed to reach its objective. It also failed to cause a withdrawal of the German offensive east and south of Lake Balaton, which continued. Under strong attacks by the Bulgar First Army the German bridgeheads along the Drava near Siklos were withdrawn commencing the night of 18/19 Mar.

#### THE BALKAN AREA

The German withdrawal from Yugoslavia appears to have been suspended. Fighting has occurred around Sarajevo and along the Drina. The line has not substantially changed and is approximately **Brod (G)—Drina River—Rogatica (G)—Sarajevo (G)—Konjic (?)—Mostar (?)—Dinaric Alps to head of the Adriatic Sea.**

## THE PHILIPPINES (19 Feb to 18 Mar 45)

At the beginning of the period operations were centered about the Manila area. Manila had been entered by American troops on 4 Feb. but there still was enemy resistance on the south side of the Pasig River. On Corregidor and in Bataan mopping of enemy remnants was in progress. Along the east side of the Central Luzon Plain, all the way from Lingayen Gulf to opposite Manila, the Japanese held the mountains. A detached enemy force held mountain positions just west of Ft. Stotsenburg. Fighting in Leyte continued, although officially closed as of 26 Dec.

#### OPERATIONS ABOUT MANILA

The XIV Corps, with the 37th Inf Div on the left and the 1st Cav Div (dismounted) on the right, was attacking the center of Manila, known as Intramuros. The 11th Airborne Div protected the rear and on 19 Feb occupied Ft. McKinley. The fighting in Manila was savage, as the enemy defended every possible place in a continuous street and house battle centering in the Ermita section.

On 21 Feb it was officially announced that the mopping of Corregidor and Bataan had been completed. Excepting Manila, all other sectors on Luzon were reported as quiet. In Manila the enemy were forced back to Intramuros. This is the old walled city, about 700 yards by 500 yards. The walls, of the Vauban type, have salients, lunettes, etc., covering the foreground. The lunette foreground on the south side is the *Luneta*, a public park and the civic center. The walls are surrounded by a ditch which had access to the sea and, being below sea level, was wet. Some years ago the sea entrances were closed and the ditch transformed into a sunken garden. It was never intended that this should be for military purposes, but the sunken garden became a dry ditch and antitank obstacle. The north side of intramuros is covered by the Pasig River. There is no foreground on this side. On the east there was a cleared foreground, but with time this had become planted with trees among which were numerous buildings. On the west side there was originally only the sea. By fills, this had become the port area. The Japanese garrison consisted mainly of the naval forces and marines previously stationed at Cavite.

By 23 Feb the 1st Cav Div had cleared Ermita south of the Luneta. It entered the Manila Hotel, on the west side of the Luneta, and started a house fight. The 37th Div east of Intramuros entered the City Hall; it was thrown out several times but always returned.

On 24 Feb the 37th Inf Div extended its right to the north side of Intramuros with a view to attacking across the Pasig River, about 300 yards broad. The Manila business district, largely in ruins, was on the

north side of the river; Intramuros, with a 30-foot wall, was on the south side. An artillery preparation successfully breached the wall. A smoke screen was then laid, and at 0830 hours infantry in assault boats crossed the river and entered through the breach. Intramuros was captured during the day. Details of the battle are not yet available.

Enemy detachments continued to hold for some days in various locations, but this campaign was now over.

#### OPERATIONS ABOUT THE MARIKINA VALLEY

The Marikina is a small river running southwest and south into the Pasig River, its mouth being 6 miles from Manila Bay and 3 miles from the edge of Manila. On the east side of the river are low hills under 2,000 feet in height, with the ridge line about 5 miles beyond the river and substantially parallel to it. An enemy force held this line and occasionally shelled Manila.

On 24 Feb (same day that Manila's Intramuros was taken) the 1st Cav Div began to move to the Marikina valley, entering line at the south end opposite Antipolo (held by the enemy), while the 6th Inf Div (which had been in the valley covering the Manila siege) closed on its left to opposite Montalban, also enemy-held.

The Japanese had carefully prepared a mountain position. Numerous caves with multiple entrances had been constructed, sited with skill so as to give cross-fire to the approaches. The American line extended on the right to Angono, on the Laguna de Bay. The XIV Corps was commanding the sector.

Initial success was prompt: the 6th Div captured Montalban on the 25th and on the 27th a dominating height about a mile beyond along the road to Wawa, which was the next objective. The 1st Cav Div attacked Antipolo, making its main effort on its right. The entire enemy position was strong. Progress became slow. On 1 Mar the cavalry division extended its right along the lake to Cardona with a view of attacking Antipolo from that side. Although the Japanese had a defensive mission, they were active and frequently counterattacked.

Operations against the Japanese became a series of small attacks with the limited objective of eliminating some cave or other center of resistance. Demolition charges were freely used, smoke being laid to cover the attackers. On 8 Mar the Air Force dropped over 1,000 tons of bombs on the Japanese positions. Thereafter air strikes were normal daily events.

On 10 Mar the 1st Cav Div entered Antipolo—a 3-mile advance in 14 days. It pushed on into the hills beyond. On the 14th it was relieved in line by the 43d Inf Div. The latter made its main effort southeast from Antipolo toward Teresa (about 3 miles distant)

jointly with an attack from the lake on the south. This maneuver succeeded in taking Teresa on the 17th. The Japanese now withdrew their left, retiring to the San Mateo Mountains. On the 18th the line was **Wawa (Jap)—Bosoboso (Jap)—Pinugay (Jap)—Tanay (?)**.

#### OPERATIONS EAST OF LINGAYEN GULF

The main enemy force, including local Jap GHQ and the Rebel Filipino Government, hold the Cagayan valley from the Pacific Ocean on the east to the Cordillera Central (bordering the China Sea) on the west. The Japanese were in close contact with American forces along the line

**Rosario (US)—Alava (US)—San Nicolas (US)—San Quintin (US)—San Jose (?)—Rizal (US)—Bongabong (US)—Baler (US)**.

The I Corps held this sector. On its left, the 43d Inf Div was at the beginning of the period relieved by the 33d Inf Div. The 32nd and 25th Inf Divs were respectively in the center and on the right.

On 24 Feb the 25th Div advanced from Rizal to Pantabangan, and next day to Concepcion. It then started an operation to seize the Balete Pass, principal entrance into the Cagayan valley. On the 27th Carranglan was reached. The 32nd Div started to advance across country toward the same pass and reached Santa Rosa (10 miles north of San Nicolas) on 4 Mar. The 25th Div arrived at Digdig, just beyond Carranglan. It was engaged with enemy on high ground to the west.

On 8 Mar the 33d Div extended its left to Aringay on the coast, whence a road leads to the right rear of the enemy opposite Rosario. The 25th Inf Div was meeting strong resistance in a continuation of the direct attack on Balete Pass. The 32nd Div reached the vicinity of Imugan.

By 18 Mar not much further progress had been made against a very strong enemy resistance. On that date the 33d Div was advancing up a tortuous road from Aringay toward Pugo. The 32nd Div was east of San Quintin and west of Imugan attacking toward Balete Pass. The 25th Div was attacking north toward the same pass from the vicinity of Carranglan. The line was

**Aringay (US)—Rosario (US)—Imugan (Jap)—Carranglan (US)—Baler (US)**.

## THE WAR AGAINST JAPAN (less the Philippines) (19 Feb to 18 Mar 45)

#### SOUTHEAST ASIA

The XV Indian Corps on the right in Arakan, the British Fourteenth Army in the center around but excluding Mandalay, and the Northern Combat Area astride the Burma Road were jointly engaged in operations to drive the Japanese out of Burma.

*XV Indian Corps* with the 81st West African Div on the north and the 25th Indian Div on the south held the west side of the Lemro River between Myahaung and Minbya. On the east side was the enemy. To outflank this strong position an amphibious expedition on 18 Feb landed the 82nd West African Div south of Dalet. There was moderate opposition, and Dalet was occupied on 1 Mar. Troops then marched northwest to Tamandu, which is 26 miles from Akyab, on 5 March. Here the enemy was found on a high ridge. It was necessary to wait until sufficient artillery had arrived, but on 12 Mar after a heavy preparation the ridge was captured. No further advance has since been reported.

The *British Fourteenth Army* had the IV Corps in the vicinity of Pakokku with a bridgehead on the east side of the Irrawaddy. The XXXIII Corps had a bridgehead near Myinmu (west of Sagaing on the south side of the Irrawaddy) with the 20th Indian Div. A second bridgehead with the 19th Indian Div was at Singu, north of Mandalay.

On 26 Feb the 2nd British Div crossed the Irrawaddy to the east of the 20th Indian Div. There was considerable opposition. Besides, there was trouble with leaky assault boats and bad motors. It took three nights and two days of continuous fighting to establish the new bridgehead. On 3 Mar the 20th Indian and 2nd British linked their bridgeheads into one. Thereafter the 2nd British Div attacked along the south side of the Irrawaddy toward Mandalay, while the 20th Indian Div covered this movement from the south. By 18 Mar the British were at Awa bridge, 10 miles southwest of Mandalay. In the meantime the 19th Indian Div marched south from its Singu

#### OPERATIONS IN THE ZAMBALES HILLS

At the end of January a force of Japanese estimated as about a division was located in the Zambales Mountains, about 3 miles west of Ft. Stotsenburg. They are still there. The 40th, 43d, and 38th Inf Divs have in turn been assigned to subdue this hostile element. The Japanese occupy jungle mountains. The summits of the range in this area exceed a mile in height. The enemy's commissary operates farms where rice and vegetables are grown. Enemy positions are similar to those in the Marikina valley, being based upon caves. All Japanese are reported as underground and practically impervious to bombing. They are well supplied with ammunition. The entire Japanese force is surrounded but it has not been reduced.

#### MISCELLANEOUS OPERATIONS

A regimental Combat Team (158th) and the 11th Airborne Div have cleared the area between Laguna de Bay and Balayan and Batangas Bays of small enemy forces. The Japanese hold all of Luzon south of this area.

The 24th Inf Div occupied Verde Island on 26 Feb and Lubang Island on 2 Mar, against minor resistance.

The 41st Inf Div occupied Puerto Princesa on Palawan on 1 and 2 Mar, after a naval and air preparation. An enemy force withdrew into the hills. The same division landed north of Zamboanga on 9 Mar and occupied that town next day against light resistance. An enemy force retired to the hills to the north. An attack against the enemy's position has been started, with strong resistance being met.

On Leyte fighting continues. The only reports made public on this are enemy casualties, which have been running about 1,000 killed a week. From the official close of the campaign on 26 Dec to include 12 Mar, 22,924 enemy have been killed on Leyte.

On 18 Mar a part of the 40th Inf Div seized a bridgehead about 14 miles west of Iloilo, Panay. It had previously been ascertained that the enemy's forces on Panay were weak and due to operation of guerrillas had been concentrated in Iloilo, with no troops elsewhere other than patrols. There was little or no opposition to the landing.

bridgehead and reached the north edge of Mandalay on 8 Mar. Here it met strong opposition. A prolonged street and house battle was started. The enemy made Ft. Dufferin, a walled enclosure within the city, his principal center of resistance. At the end of the period the enemy held this large fort and some other sectors of the city.

The IV Corps, using armor, started from its bridgehead on 2 Mar and, meeting only occasional resistance, reached Meiktila on the 4th. Infantry commenced to arrive the same day by transport planes. This operation was to cut the enemy's lines of communication leading north to Mandalay. At the end of the period this British force was raiding throughout the area. It was meeting considerable resistance.

The *Northern Combat Area* (with the 36th British Div, the 50th Chinese Div, and the Chinese First Army, in the order given) held the line Myitson—Mongtat—Hsenwi.

The 36th British Div advanced south and against considerable resistance reached Mongmit on 10 Mar. By 18 Mar it was at Mogok. The 50th Chinese Div captured Namtu on 23 Feb and arrived at Hsipaw on 17 Mar, finding a strong hostile force just beyond. By slow daily advances the 18th reached Lashio on 7 Mar. By the 18th it was 16 miles beyond on the road to Hsipaw, in contact with another strong enemy force.

*Miscellaneous.* The 20th Bomber Command (U. S.) has been active. Among other places it has attacked Singapore, Kuala Lumpur, and Rangoon.

In general, the Japanese are opposing the British concentric attack. It is an active resistance with frequent counterattacks.

#### SOUTHWEST PACIFIC COMMAND (LESS PHILIPPINES)

Air operations have been somewhat reduced. They still involve practically daily attacks along the coasts of Borneo on northwest and

east sides, on Celebes and Halmahera, on New Britain, New Ireland, and Bougainville, and on the enemy's largest force in this area, near Wewak on the north coast of New Guinea.

Against this hostile force Australian troops started east along the coast from Aitape last October. A parallel column moved down the Sepik valley. By 12 Mar the advance had reached a line from Sawom (inc) on the coast to Maprik (exc) in the Sepik valley. This represents a 50-mile advance in 5 months. To Wewak is 45 miles further.

At Bougainville, an Australian force landed on Saposa Island off the northwest coast on 8 Mar and four days later landed without opposition on Bougainville.

A small Australian amphibious expedition has extended the occupied area of New Britain to northeast of Open Bay and Wide Bay.

#### PACIFIC FLEET COMMAND

Occasional bombings have been made in the Kurile Islands, against Wake and Marcus Islands, and against the Palau Islands, Yap, Kusaie, Sonsorol, Ponape, and Marshall Islands. The main operations have centered on the bombing of Japan and the capture of Iwo Island.

#### Japan

Bombings have been conducted by the 5th Fleet and by the 21st Bomber Command. The former attacked between 25 Feb and 1 Mar, both days inclusive. Its objectives were Tokyo, Hachiyu, and airfields on the first three days; none on the 28th; and the Ryukyu Islands on the 1st. Damage caused on land is reported as having been considerable. That at sea included the sinking of a Japanese destroyer and over 50 small vessels. Our losses are given as 22 planes lost, and no damage to ships.

On 18 Mar the 5th Fleet commenced an attack on Kyushu Island.

The 21st Bomber Command operated super-bombers from Guam, Tinian, and Saipan. On 25 Feb more than 200 of these planes attacked Tokyo at the same time that the 5th Fleet was operating over the area. This was the largest number of super-bombers ever dispatched prior to this time. This was exceeded soon afterward, however. On 4 Mar another attack on Tokyo was made through clouds. On the 10th a 300-plane attack was made between 0000 hours and 0240 hours. A 3-hour midnight attack was made against Nagoya on the 12th, another by about 90 planes against Osaka on the 14th. A 2-hour midnight attack was made by about 60 planes against Kobe on the 17th. In all cases large conflagrations resulted.

#### Iwo

Iwo is an egg-shaped island about 5¼ miles long by 2½ wide. Its apex points to the southwest. An operation by the Pacific Fleet Command to capture it had been planned for several months. The object of seizing this small island was to provide fighter cover for super-bombers based on Guam, Saipan, and Tinian for attacks on Japan; to establish an airbase suitable for medium bombers; to remove a Japanese air base from which Jap planes raided Saipan, Tinian, and Guam. Iwo had two airfields; a third was known to be under construction.

The capture of Chichi Island (some 200 miles to the north) had been considered. Iwo was preferred, as Chichi has only one airfield and its beaches are more difficult to land over.

Operations commenced against Iwo about 10 Dec 44, from which date it was daily and heavily bombed. A strong surface fleet shelled the island from all directions on 16, 17, and 18 Feb. firing almost 3,000 tons of shells a day. After this preliminary and lengthy preparation the V Amphibious Marine Corps on 19 Feb landed the 4th Marine Div on the southeast beach and the 5th Marine Div on the southwest beach. Landing was at 0900 hours and was strongly covered by naval and air fire. Losses were reported as moderate. By 1800 hours a line had been established across the island south of the south airfield, facing northeast. Strong enemy opposition began to be felt. An enemy strong point was southwest of the Marines in a low, inactive volcano—Suribachi. After the initial landing the enemy opened a strong artillery fire on the beaches. These are of volcanic sand, deep and difficult for vehicles, whether wheeled or tracked. Some vehicles moved slowly, others were unable to move. The vehicles were

excellent targets. Many were destroyed. Within a short time the beaches were littered with debris. Many landing craft were wrecked. As Iwo has no resources, everything needed by the troops (including water) had to be brought ashore. Getting supplies over beaches of deep sand under constant enemy fire caused heavy casualties. The first trucks got on land out of the sand on the 20th. For some time all or most supplies were hand-delivered.

Japanese resistance was fanatic. During the 20th the two divisions, on a combined front of 1¼ miles, advanced about the same distance across the south airfield. Next day the attack was directed against the main airfield about ¼ mile to the front. The 4th Marine Div was unable to make this distance, but the 5th on the left passed beyond the south end of the airfield to its west for a gain of 1,000 yards. It now being evident that the capture of Iwo might be harder than expected, the 3d Marine Div, afloat in corps reserve, was ordered to land that night.

The enemy maintained artillery and infantry mortar fire on beaches. They became strewn with wreckage of all kinds. The range was short. Targets were so numerous that the enemy seldom failed to hit something. Artillery, rockets, and mortars were used against the troops, who on the 22nd made only slight advances.

On the 23d the 3d Marine Div was in line between the 4th on the right and the 5th on the left. More small gains were made in very heavy fighting. A detached operation to the south reduced Suribachi, thereby eliminating enemy fire in rear of the American front. A strong naval force gave constant artillery support, and naval planes from carriers were overhead continuously.

After an unusually strong artillery and air preparation the three Marine Divisions attacked on 25 Feb. In the center the 3d seized about 2/3 of the main airfield, with the flank divisions trailing off to the rear. This advance resulted in a marked reduction of enemy artillery fire within the beachhead. The main airfield was cleared on 1 Mar.

On the following day the 3d Marine Div advanced 700 yards to high ground beyond the airfield, the flank divisions still in rear. Everywhere there was heavy opposition. The enemy counterattacked often at night, less frequently by day. As the Japs were driven north the supply problem improved, as there was less artillery fire on beaches and more space to distribute dumps. In daily attacks under hard conditions, by the 5th the enemy had been driven back to a line through Mounts Osaka and Higashi.

After a most intense artillery preparation an attack was launched on 6 Mar. It made only small gains. Better ones occurred next day. During the night 8/9 Mar the enemy made a large attack on the east side but failed to advance his lines. During the ensuing day the 3d Marine Div reached the sea at the northeast end of the island. The end was in sight.

By 11 Mar the 5th Marine Div had covered an enemy detachment squeezed into the north tip of the island, while the 3d and 4th had only isolated remnants before them along the northeast shore. Although the enemy was reduced to comparatively small numbers he was fighting as vigorously as ever. On the 15th the 5th Marine Div completed the reduction of the enemy at the north tip. The 3d and 4th Divs finished their mopping by the 18th. On the night preceding this date the Japanese Commanding General made the usual suicide charge. He does not seem to have had many men left to make it with, and it accomplished nothing. Save for some mopping, this ended this campaign.

The total enemy force on Iwo was estimated as about 20,000 to 22,000 men, practically all of whom were killed. Our own losses have not been completely reported. They totalled (all classes) not much less.

#### INDO-CHINA

On 9 Mar the Japanese relieved the French authorities in Indo-China, under the charge that they had been secretly communicating with the Allies with a view to delivering their country over to Allied forces. The French troops were disarmed.

#### CHINA

There has been no change in the situation. The U. S. 14th Air Force is concentrating on attacking lines of communication by rail, road, and water.



# RESUME OF ACTION OF THE 18TH FA BN

**This description is very typical of what each battalion participating in the St. Lo operations went through. Because of its representative character, it is much more than just the account of one battalion's experiences in the breakthrough and subsequent operations.**

D-day—June 6, 1944—found the 18th Field Artillery Battalion on an artillery range in Southern England, and was as big a surprise to us as to the folks at home. While the campaign for the Cherbourg Peninsula was being fought we remained in England making final preparations for sailing. We embarked on the 4th of July and arrived in France in time to join the line of battle as it turned south in the second phase of the battle of Normandy. The plan at this time was to force the Germans to commit all their reserves by unrelenting pressure all along the line and then break through. Our first positions were a few hundred yards north of La Haye du Puits, which had just been taken. Some batteries were rolling into their positions not more than twelve hours after debarking at Utah Beach. Registration of the battalion was conducted by the battalion commander with C Btry firing the first round from the battalion at 1632 on the 9th of July.

B Btry "captured" the battalion's first prisoners in this position that night. Seven nonchalant Germans were brought to the command post by ten (10) brave (?) cannoneers. The fighting was tough in those hedgerow days. The smell of death permeated everything. There were dead soldiers along the roads and dead cattle everywhere. The forward observers of the battalion often adjusted our fire on the next hedgerow to their front—sometimes less than 100 yards away.

The little town of Vesly in this sector is one we will all remember. It was there we first caught it from enemy artillery. In moving to these positions we used roads that were under continuous enemy harassing fire. That's no fun when you are up on a 2½-ton truck. Somehow the Germans located A and B Batteries that night and we had our first losses.

When this drive reached the Lessay River we were shifted to the St. Lo sector for the breakthrough there. The parties, fired on by enemy machine guns while on this reconnaissance, beat a hasty retreat on hands and knees. Positions were finally occupied near the village of Pont Herbert.

Things were quiet while everyone waited for the weather to break for the big push. The Germans committed most of their air force during this period and every evening saw the sky lighted up by tracers and antiaircraft fire. One FW-190 was shot down by our fire on the 23d of July, and dove to the ground with a loud explosion not 300 yards from A Btry gun positions. The battalion OP was considerably forward and was used by all field artillery battalions in that sector for registration. The telephone line was a long one and was constantly being knocked out and repaired by our wire crews under enemy fire.

Gen. McNair was killed by the first air strike not a thousand yards from the battalion area and bombs fell to our right and left. For the big day we had a ringside seat, however. Airplanes flew over all morning. We were almost on the bomb release line and could see the sticks of 500-pounders fall from the bomb bays.

We were busy too, firing against the German flak batteries and enemy strong points.

As the divisions poured through the gap we were attached to them in turn: as they peeled off to the left we joined the next one coming through. On one occasion we had made a long night march to keep up with the infantry and happened to be the only artillery in position to stop the German counterattack that began the next morning from Tessy sur Vire. In 18 minutes the battalion fired 425 rounds and was given a great share of the credit for breaking up in that sector the enemy effort which, if successful, would have been a serious threat to the Allied breakthrough.

When the attack had progressed as far as St. Sever de Calvados the 18th Field Artillery Battalion was pulled out and became a part of a provisional task force to protect the right flank of the U.S. First Army as it turned and streaked for Paris. One position was near the beautiful French town of Mayenne. Here was our first chance to relax a bit. Mayenne was not too badly torn up, the river was just right for swimming, and the weather was fine. We were there nearly two weeks and everyone was in better shape when we moved on.

Until the first of September we (like everyone else) moved along, keeping up with the rapid advance of our forces. There wasn't much fighting so we looked at France as we rolled through. We saw the famous cathedral at Chartres and the town of Alencon, and stopped for a few days near Etampes, south of Paris. It was here that our air section really received a hero's welcome. When our two cubs landed they were the first "Air Force" the people had had an opportunity to observe closely. They had eggs for breakfast, slept in beds, and generally lived off the fat of the land. They deserved a break because they had been in some tough spots in Normandy. A cub is not much protection against 88-mm antiaircraft fire.

Supplies now became a problem for the American forces so we, like other artillery outfits, furnished trucks to the quartermaster to haul infantry, gas, and ammunition. The battalion kept its guns moving along with the front even while a great many of its trucks were away on this detail. This meant a lot of doubling up and other problems but it was all part of our share of the war.

Paris was free now and the chase was on. Armored divisions were spearheading the way, breaking up the German retreat into a rout. We crossed the Seine and the Marne, saw Soissons and Chateau Thierry. We missed Paris by about 10 miles and kept on pushing north.

On the 1st of September we were attached to a spearhead armored division. Eight days of real excitement followed. The armor fights along the road and is prone to leave behind sizable German forces who are ready to jump on anything that comes along. We had to make a long night march through such country to join this armored force, but luckily the things that happened to us were humorous. Once a couple of German soldiers, thinking it was a friendly column, tried to catch a ride back to the "Fatherland." Another time a German motorcyclist joined the column behind the CP truck. He stayed with us quite a while. We thought he was an FFI man until someone yelled "Viva la France" at him and he ducked away on a side road.

We almost got shot up by one of the armored division's

roads blocks as we pulled into position. It happened that two German staff cars filled with officers had been leading our column by about 500 yards. The tanks on the road blocks shot them up and were all set to throw it into us when they recognized our blackout lights. Next day a battalion of SS infantry jumped on B Btry as we marched along in column with armor. They must have thought they had picked a soft spot but it didn't turn out that way. We counted over 75 enemy dead and took 250 prisoners. We had broken charge after charge with our carbine, MG, and bazooka fire.

On the following day A Btry *picked* a fight with a German column concealed in the woods about 400 yards from the battalion position area. This was a real scrap too, and everybody joined in. The Germans panicked after all their vehicles were on fire, and we ran them down until all were killed or taken prisoner. We felt pretty good. We had kept the Germans from taking our vehicles and then the next day turned around and ruined one of their columns.

A few days later C Btry had its chance. A sizable German force was concealed in the woods in the midst of the Armored area. When night fell the Germans turned their mortars on our installations and started raiding our outposts near the woods. C Btry spotted the flash of the mortars, wheeled their guns around, and began pouring TNT on the enemy. They fired 179 rounds. When it was over the mortar ammunition had been blown up and the Germans were coming out of the woods and giving up. That armored division still remembers us for the service we rendered that night.

While we were having all these troubles the battalion S-3 and Train Commander, who were rejoining the battalion with the trucks from the supply detail, were having troubles of their own. There weren't many of them, and at one place the head of the column stopped to ask directions while the rear was in the midst of

a group of Germans. Fortunately all the Germans did was give them dirty looks.

We all felt amply repaid for our hard times. The laughter and blessings of the people with the first sweet taste of liberty still on their lips will never be forgotten. The people of Mons, Charleroi, Namur, and Huy, all dressed in their best, lined the roads as we passed, cheering until they were hoarse. We hit Charleroi after midnight but everyone was still up—from babes in arms to grandmothers laughing and crying with joy.

We were pulled out to reform a provisional trucking battalion since the supply problems were becoming more and more acute as we got closer and closer to Germany. While not dangerous, it was a tough job: up night and day in all kinds of weather, moving supplies up to the combat troops. There was also developing an increasing shortage in telephone wire, so Headquarters Battery wire section joined part of a provisional signal company for the salvage of wire that had been left behind. The battalion received an official commendation from the Commanding General of the U.S. First Army for our share in solving the battle of supply. Another commendation was received praising the work done by the wire recovery crews.

We got back in the fight in November when we fired in support of the new offensive south of Aachen. We fired from the trees of Huertgen Forest and the ruins of German villages. As German counterbattery fire was quite active, we began to have losses again.

When the Germans broke through to St. Vith and Bastogne in December the 18th Field Artillery was on the northern flank of the breakthrough area and helped to hold the corner at Monschau. It was later committed further west on the north flank of the German salient where a cold Christmas and New Year were celebrated by sending personal messages to the Germans in the form of 105 HE.

To date of writing the battalion has been attached to 12 different divisions as part of 5 army corps.

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## B BATTERY'S BELGIAN BAPTISM

At 1800 hours on 2 Sept 44 the leading elements of one Field Artillery Battalion crossed the Belgian border. This battalion was the last combat element of the right column of its Combat Command. Preceded by a platoon of 6 tank destroyers, it was followed by the Combat Command trains at a time distance of about an hour. Order of march in the battalion was Bn CO, CP Section, Batteries C, A, Hq, and B, with the Battalion Executive bringing up the rear of the column. Service elements were with the trains.

The action that day had been light and the movement steady, with occasional stops of five minutes or so while light resistance was eliminated. About 1830, however, the column halted and the tank destroyers began firing to the east from positions on the road. Investigation showed they were firing at a German column about 1,000 yards away; the Germans were scattering and their vehicles burning. As the tank destroyer commander had orders to continue as soon as possible, the artillery made no attempt to bypass him.

Some ten minutes later a radio call from Baker Battery Commander reported that he was being attacked by German bicyclists. When asked if he could hold them, he said he hoped so.

The Battalion Executive was instructed to return along the route and get some tanks from the Trains to help. Then, accompanied by the LnO of the Armd FA Bn and his half track, the Bn Comdr reached B Battery about 1900.

Before arrival he had expected to find B Btry's column subjected to scattered sniper fire, but instead he saw a full-scale battle in progress. The road north of and about 75 yards away from the junction was covered with German dead and wounded and their bicycles; enemy machine guns had been emplaced and were firing; and the enemy were attacking through the ditches and woods and from behind the houses. The Americans had posted themselves behind vehicles, hedges, or anything from which they could fight. Those whose jobs made it impossible to find adequate cover were calmly going about their business in the open. The most impressive thing was the manner in which they were all doing their jobs. All weapons were in play, ammunition for machine guns and bazookas was being checked and replenished, and the defenses were being constantly improved. There was little left to be done except post the half track, check the defenses, and coordinate contact with Hq Btry (which was next ahead of B).

About 1930 the enemy fire abated. The battery stood by to await developments—which were not long in coming. In a

few minutes down the road from the cover of the trees came from 75 to 100 Germans, followed by five trucks and half tracks approximately 10 yards apart. There were machine guns on the vehicles and it was obvious that the men on foot were armed, but for some reason not a shot was fired. The enemy were carrying their arms at the port and their intentions seemed doubtful. When about 100 yards away they began to yell "Sieg Heil" and run toward the column. Their vehicles picked up speed behind them.

About 30 yards in the lead was a single German carrying a light machine gun with a tripod mount. When about 50 yards away he suddenly dropped to the ground and fumbled with the mount. This dispelled all doubt as to the enemy's plan, though until that movement it was thought they might be yelling "We surrender." Four or five men stood up and finished off the machine gunner with their carbines; the rest of the battery opened upon the column. The .50s and one of the bazookas cut into the vehicles and shortly had all stopped dead and burning. The ammunition of one enemy half track went up, adding to the noise and no doubt causing a few more German casualties.

Although the enemy had set up machine guns at the top of the hill to cover their advance and had considerable small arms fire power in their column, B Btry's men remained in their exposed positions along the road to fire round after round into the Germans.

The advantages of terrain were with the enemy, who had high ground looking down onto our road, yet the battery seemed to bear charmed lives. Aid men took care of them quickly while the others continued firing without hesitation. Bullets were clanging into our vehicles, but without serious damage. Later it was found that a bullet had penetrated the Battery Field Desk and became embedded, of all places, in the Property Book.

It was learned later from prisoners that the enemy had hoped, by a mass attack, to break through the column at the road junction, thinking it to be a force of a few vehicles only. When this failed they changed their tactics, dispersed, and tried to creep up on the column through the hedges and ditches, and some occupied the nearby houses and opened fire. Some of these attempts to close must have come near success, as after the fight several German dead were found only thirty yards from the column.

This phase of action sounds like a dime thriller, and it was. The distances involved were well within carbine and bazooka range, so that every weapon in the battery except the guns was in action. An example of the action of the battery as a whole was the teamwork displayed by the machine gunners and the bazooka men at the corner. When the machine gun fire at the two houses along the road, from which some of the enemy were firing, proved ineffective, the bazooka went to work and shortly had one house on fire and several holes in the other. After that the column was not troubled from that direction.

Time passed quickly. It was dusk almost too soon. By 2100 it was difficult to see, and the battery was forced to think about conserving its small arms ammunition. Fortunately just about that time a message was received that some tanks were being brought up. Four of them went to the left flank, whence they completed the demoralization of the enemy. About 2115 white flags or shirts appeared. The battle was over. The prisoners were herded into a field and left with the signal section of B Btry; the able bodied totalled 248; no count was made of the wounded. They were turned over to the military police of the rear echelon about thirty minutes later.

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## NEW DISTRIBUTION FOR WDLOs

In line with the Army's policy of improving the efficiency of operations wherever and whenever possible, a new system of distributing War Department Lubrication Orders (WDLOs) is being put into effect. The system is intended to make distribution of these important maintenance forms automatic, to insure that no piece of equipment is operated without them.

Since, however, no distribution system on such a large scale as that of the Army can be expected to be 100% effective, and since the distribution within individual units must of necessity be left up to officers of the unit, it is important that officers know at all times which WDLOs are available and how to obtain any copies they may need.

It often happens that in the distribution of WDLOs by The Adjutant General, because of frequent organizational changes the unit commander will find that the number of copies allotted to his unit does not fill the requirements of the unit; thus he will have to requisition copies in addition to those originally received. Then too, copies will be lost or destroyed or worn out.

Under the new system, the WDLO for a piece of equipment is placed in the same classification as the equipment's technical manual. It is given the same distribution as the manual and, to make identification simpler, it carries the same number, except that the letters "LO" replace the letters "TM." For example, the technical manual TM 9-772 and the lubrication order LO 9-772 pertain to the same piece of equipment. Incidentally, although old-style lubrication orders will be superseded as rapidly as possible by the new-style ones (metal bound cards are "out" and only the decalcomanias and ordinary cards will be issued from now on), the former should continue to be

used and requested until the new-style replacements are received or are listed in FM 21-6. *List of Publications for Training*.

This publication makes it easy to keep posted on the new WDLOs, for it comes out once a month, lists all WDLOs available, and marks those issued during the past month with an asterisk for quick identification. In addition to listing the WDLOs FM 21-6 describes them, specifies how they are to be used, and tells how the necessary extra copies may be obtained.

It is mandatory that each piece of equipment be accompanied by its WDLO at all times (see Cir. No. 114, W. D., 1944) and it is the officer's responsibility to see that this be carried out. In this connection two important points should be strongly emphasized. All too frequently it will be found that a complete file of WDLOs is kept by the sergeant major of a unit while the equipment maintenance men do not have copies to work with. Inasmuch as WDLOs are *work* sheets, placing them in a file serves no useful purpose. This practice must be stopped. It is the sergeant major's responsibility to see that WDLOs he receives are *distributed* to the men who need them.

The other point that should be kept in mind is the fact that WDLOs must be constantly checked to make sure that the current one for every piece of equipment is being used. Here again, reference to FM 21-6 is important in checking WDLOs available for issue so that obsolete copies may be destroyed and replaced. In this regard, the enlisted man should feel no hesitancy in reminding the responsible officer of his requirements if WDLOs are not forthcoming when they are due.

Now is a good time to check up on your WDLOs. Their use insures the correct lubrication of equipment that is necessary for most efficient operation and longest possible life of your equipment.

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Neglect of first and second echelon maintenance causes most artillery defects, it has been noted on the battlefronts. When thorough instruction in preventive maintenance is given, artillery stays in line firing.



## F . A . S . E V E N T S

Col. Benjamin B. Lattimore, formerly executive officer of the FARTC here, has been transferred to the School and appointed commanding officer of FAS detachment. Col. Hugh P. Adams, who has been commanding officer of the detachment, has been transferred to the Department of Combined Arms of the School.

Lt. Col. Roy F. Barker is now commanding officer of officer candidate headquarters of the School.

Lt. Col. Frank W. Roberts is acting as adjutant general of the Field Artillery School during the absence of Col. Warner W. Carr, who entered the Army and Navy General Hospital at Hot Springs, Arkansas, as a patient.

Col. James E. Samouce, executive of School Troops, has been transferred to the 431st FA Group, Camp Gruber. Col. Samouce was a former S-3 of the School.

Lt. Col. Gordon J. Wolf, director of the Department of Air Training, left recently for the European Theater as a special observer to study Field Artillery air operations.

Col. Harold T. Brotherton of the School staff has returned to the U. S. after six months in Italy as a member of the AGF board, observing Field Artillery operations. Before leaving for Italy last July he served as S-3 of the School. At one time he was provost marshal here and also served with the old 18th Field Artillery Brigade.

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The Observation Section of the Department of Combined Arms has been designated as a separate department of the School and is now known as the Department of Observation. Lt. Col. Paul R. Walters, who has been head of the section, has been named as the department director.

\* \* \*

A reorganization of school troops has been completed. Training detachments have been formed replacing the tactical units attached to the School to serve as troops for firing and instructional purposes. Brig. Gen. George H. Paine, previously commanding the 31st FA Brig, has been named commanding general of the school troops.

Units in the School Troops include five Field Artillery Training detachments, a Field Artillery Observation Training detachment, an Infantry Training detachment and a Field Artillery Motor Pool detachment. The Field Artillery Training detachments have been organized so the units will be able to employ any of the field artillery weapons desired for particular demonstrations or school problems. Transportation of students and transportation necessary for the administration of the school will be handled by the Motor Pool detachment.

### DEPARTMENT OF AIR TRAINING

Field Artillery liaison airplanes which have withstood several

hundred hours in the air have just begun their service at the FAS. These planes head for the overhaul line of the Department of Air Training for a complete rebuilding and roll out ready to take more student pilots into the air.

Under the direction of Maj. Marion J. Fortner, engineering officer, the program serves not only to maintain the planes but provides invaluable training for field artillery air mechanics. It saves the government many thousands of dollars: from March 17 to July 16 last year, 126 liaison planes passed through the overhaul line, resulting in a saving to the government of approximately \$231,000 in addition to giving personnel invaluable training without interference with regular instruction.

Planes going through the line are stripped of their covering and the frames inspected and repaired. Engines are top overhauled by the department or shipped to an air depot for major overhauling. After being recovered the planes are spray painted and reassembled.

The overhaul line program is coordinated with the air mechanic course, which includes practical work in maintenance. For the most part, however, personnel for the work are drawn from the mechanics' pool which is maintained at a minimum authorized strength of 45 graduate mechanics.

### DEPARTMENT OF GUNNERY

The Officers' Refresher Course, successor to the Officers' Advanced Course (OAC), graduated its first class on 24 Mar 45. During their eight weeks' stay at Fort Sill, the 55 graduates of ORC No. 1 tucked 157 hours of gunnery under their respective hats. These gunnery hours are divided as follows: observed fires, 56; unobserved fires, 58; fire direction, 43.

Much of the work in these gunnery subjects is practical, and is designed to give the students the "how" and "why" as well as the principles and problems involved. The present course includes eight 4-hour service practice periods.

Prospective students for the Officers' Refresher Course will be interested to know that the Gunnery Department assumes that since the course is a refresher course, the students will arrive at Fort Sill with a fair working knowledge of the conduct of fire, gunnery mathematics, the military slide rule, GFTs, and the principles of survey.

A service practice devoted entirely to high angle precision and bracket problems is meeting with considerable student enthusiasm, as is also a large-T service practice period. Both of these periods are at present designed to show some of the problems involved in long range observation.

Another interesting period is a practical fire direction shoot in which both the 155-mm howitzer M1 and the 155-mm gun M1 are employed. One of the missions consists of a center of impact registration deep in enemy territory conducted by high

# GRAPHICAL FIRING TABLES

can be ordered from the  
Book Department, Field Artillery School, Fort Sill, Okla.,  
as follows:

<i>Catalog No.</i>	<i>Weapon</i>	<i>No. of Scales</i>	<i>Equivalent to Ordnance GFT</i>	<i>Ammunition</i>	<i>Price Complete</i>
G-17	3 Inch Gun, M5 and M7	1	M29	Shell M42A1. Charge Normal & Reduced	<b>\$.25</b>
G-9	75mm How. M1 and M1A1	3	M24	Shell M48, Charges 1, 2, 3 & 4 Shell M41A1. Charges 1, 2, 3 & 4 Shell M48 & M41A1, High Angle	<b>.75</b>
G-11	75mm Gun, M3	1	M30	Shell M 48, Charges Reduced, Normal & Super	<b>.25</b>
G-30	76mm Gun, M1, M1A1 and M1A2	1	M25	Shell M42A1, Charges Reduced & Normal	<b>.25</b>
G-21	90mm Gun, M1	1	M26	Shell M71	<b>.25</b>
G-8	105mm How. M2 and M2A1	3	M23	Shell, M1, Charges 1, 3, & High Angle Charges 4, 5, 6 & 7 *High Angle Increments 2-3 to Charge 2	<b>.75</b>
G-15	4.5 Inch Gun, M1	1	M27	Shell M65, Charges Normal, Super & High Angle	<b>.25</b>
G-10	155mm How. M1	2	M28	Shell M107, Charges 1, 3 & High Angle Charges 4, 5, 6 & 7	<b>.50</b>
G-19	155mm How. M1	3		Shell MKIA1, Propellant M1A1. Charges 1 & 3 Propellant M1A1 and M2, Charges 4, 5, 6 & 7 Shell MKIA1. Propellant M3, Charges 1, 3, 4 & 5	<b>.75</b>
G-20	155mm How. M1	3		Shell M102, Propellant M1A1 Charges 1 & 3 Propellant M1A1 and M2, Charges 4, 5, 6 & 7 Shell M102, Propellant M3, Charges 1, 3, 4 & 5	<b>.75</b>
G-14	155mm Gun, M1 and M1A1	1	M31	Shell M101, Charges Normal, Super & High Angle	<b>.25</b>
G-12	8 Inch How. M1	4	M33	Shell M106, Charges 1, 3 & High Angle Charges 4, 5, 6 & 7 Shell MKIA1, Charges 1, 3 & High Angle Charges 4, 5, 6 & 7	<b>1.00</b>
G-16	8 Inch Gun, M1	2	M35	Shell M103, Charges Reduced, Normal & Super Charges Normal & Super	<b>.50</b>
G-31	240mm How. M1919A1	3		Shell MKIII A1. Charges 2, 3, 4 & 5 Charges 6, 7, 8 & 10 High Angle	<b>.75</b>
G-13	240mm How. M1	2	M32	Shell M114, Charges 1, 2, 3 & 4 High Angle	<b>.50</b>
G-18	4.2 Chemical Mortar, M1A1 and M2	2	M37	Propellant M6 (Variable Elevation) Propellant M6 (Constant Elevation)	<b>.50</b>

Each rule is furnished with a semi-detachable indicator.

\*A new rule which provides data for high angle fire down to 1200 yards range.

This rule can be purchased separately as Catalog Number (G-32) for 25c.

Above prices include all mailing cost to any part of the world.

All prices are subject to change without notice.

performance aircraft from a tactical reconnaissance squadron. The corrections so obtained are used in executing from several battalions surprise counterbattery fire on an enemy battery that has been definitely located.

Recent developments in the Officer Candidate and Officer Special Basic courses include more emphasis on high angle firing, large-T service practice with the r greater than 6,000 yards, service practice from Field Artillery liaison airplanes, and occasional designation of a target location with a single HE burst in an area having no fixed adjusting point.

## DEPARTMENT OF COMMUNICATION

Major activities of this department during March included research on communication equipment and principles and the test of recently received Test Set TS-26/TSM.

A study of proposed integrated communication systems has been completed. This integrated system, which is designed to be superimposed on existing systems, provides "backbone" communication from army to platoon or to any intermediate level. Switching facilities permit free use of radio or wire in transmitting a message along the "backbone."

Research on a mechanical wire splicer continued. Although a splice made by this device is temporary only, increased speed in splicing field wire circuits can be expected when communication personnel are performing wire maintenance in areas under enemy fire.

Test set TS-26/TSM, a voltometer for line testing, was received. This set is used to detect grounds, crosses, shorts, and opens, and to measure insulation and conductor resistance as well as line and battery voltage.

## DEPARTMENT OF MATERIEL

Firing of the 240-mm howitzer and the 8-inch howitzer was included in the March 17th field exercise, to give students the opportunity to observe the firing effects and compare the effects with smaller caliber field artillery weapons. The heavier weapons will be fired at exercises every 10 weeks, provided ammunition is available.

The Department of Materiel has introduced a special course in antiaircraft fire to train troops in the technique of firing AA machine guns.

## S-3 SECTION

A Training Literature and Visual Aids unit within the S-3 Section of the School was organized 8 Feb. Col. Edward M. Edmonson was appointed Director of the unit, which includes a research group, editorial group (formerly the publications section), and a visual aids group. Lt. Col. Gerald N. Bench is in charge of the visual aids group and Maj. H. E. Hallock has charge of the editorial group.

The research group is responsible for preparing manuscripts for training literature projects authorized by AGF. It also surveys the needs of field artillery for training literature and recommends the preparation of essential material. Another duty is to keep existing training literature up to date by submitting changes or recommendations for revision. This group also studies current combat reports for new techniques, new methods, and current trends in doctrine for possible inclusion in field artillery training literature.

The visual aids group continues its work of organizing and supervising the production of training films and film strips. It also prepares charts for issue to units of Army Ground Forces

and illustrations for inclusion in training literature prepared by the research group.

The editorial group edits and prepares for publication training literature written by the research group.

DEPARTMENT OF MOTORS

Officers recently assigned to the Department of Motors include Lt. Col. Honald N. Mardt and Maj. C. E. Grenard, who returned recently from the CBI Theater of Operations where they were training Chinese troops in motor vehicle operation and maintenance.

New training aids now in use by the department for the instruction of students include wooden models of the dual range clutch of the M5 tractor and the overrunning clutch of the M4 tractor.

1st Lt. Eric Darmstaedter  
 1st Lt. Harold O. Davis  
 1st Lt. Stanley H. Davis  
 1st Lt. Arnold G. Eakins  
 1st Lt. Howard H. Gerrish  
 1st Lt. Glen Gillis  
 1st Lt. George E. Handley, Jr.  
 1st Lt. Edward E. Merritt  
 1st Lt. Henry A. Olson  
 1st Lt. William M. Peterson  
 1st Lt. Albert E. Wahlke  
 2nd Lt. Lemuel A. Bell, Jr.  
 2nd Lt. James W. Carter  
 2nd Lt. Floyd C. Erickson  
 2nd Lt. Edward Goldfischer  
 2nd Lt. Robert A. Schlin's

Dept. of Air Training  
 Dept. of Air Training  
 Dept. of Motors  
 Dept. of Air Training  
 Dept. of Communication  
 Dept. of Air Training  
 Dept. of Communication  
 Dept. of Motors  
 Dept. of Air Training  
 Dept. of Air Training  
 Dept. of Air Training  
 Dept. of Air Training

PERSONNEL CHANGES

*Arrivals*

<i>Name</i>	<i>New Duty</i>
Col. Edwin A. Henn	
Col. Benjamin B. Lattimore	FAS Detachment
Lt. Col. Neil D. Cox	
Lt. Col. Willis T. Ellis	Dept. of Combined Arms
Lt. Col. Robert D. Heeschen	Office of Asst. Comdt.
Lt. Col. John G. Keller	
Lt. Col. D. A. Mathewson, Jr.	Dept. of Combined Arms
Lt. Col. Robert S. Perkins	
Lt. Col. Frank W. Roberts	Adjutant General
Lt. Col. William C. Russell	Dept. of Combined Arms
Lt. Col. William F. Wulf	
Maj. James Cantey	
Maj. Howard T. Freeman	
Maj. Crawford E. Grenard	Dept. of Motors
Maj. Don L. Huseman	
Maj. Paul G. Keating	
Maj. Raymond G. Kells	Dept. of Gunnery
Maj. Chester H. Meek	
Maj. George E. Morgan	S-3 Section
Maj. James S. Thornton	Dept. of Combined Arms
Maj. Don H. VanDam	Dept. of Combined Arms
Capt. Frederic Beekman	
Capt. Wendell H. Brubaker	Dept. of <i>Gunnery</i>
Capt. Albert V. D. Carr	Dept. of Combined Arms
Capt. William C. Carr, Jr.	Dept. of Communication
Capt. Thomas J. Coleman	
Capt. Alvin E. Graham, Jr.	
Capt. Joseph P. Holloway	Dept. of Materiel
Capt. Victor O. Kohler	Dept. of Materiel
Capt. Marshall J. Pujio	
Capt. Harold J. Reedy	
Capt. Eric M. Rickard	
Capt. B. R. Thomason, Jr.	Dept. of Communication
Capt. Andre B. Truden	FAS Detachment
Capt. Robert F. Woods	Dept. of Communication
1st Lt. Alexander P. Bolding	
1st Lt. Hubert E. Bowen, Jr.	
1st Lt. Marvin F. Clarke	Dept. of Combined Arms

*Departures*

<i>Name</i>	<i>New Duty</i>
Col. Thomas G. M. Oliphant	A.P.O 4318, New York, N. Y.
Col. James R. Wheaton	European Theater of Operations
Lt. Col. Jesse G. Faes	Separation Center, Ft. Leavenworth
Lt. Col. Walter E. Kraus	432nd FA Gp, Camp Bowie
Lt. Col. Thea L. Lipscomb	414th FA Gp, Camp Hood
Lt. Col. Dalies J. Oyster	618th FA Obsn Bn, Camp Gruber
Lt. Col. Frank W. Wheless, Jr.	AAF Reg Hosp, Sheppard Field
Maj. Allen Campbell	AGF Repl Depot, Ft. Ord
Maj. Edwin C. Knake	AGF Repl Depot, Ft. Ord
Maj. Robert P. Knapp, Jr.	AGF Repl Depot, Ft. Ord
Maj. Barton G. Lane, Jr.	394th FA Bn, Ft. Sill
Maj. Walter C. Long	AAF Reg Hosp, Sheppard Field
Maj. Clarence F. Roberts, Jr.	798th FA Bn, Ft. Bragg
Maj. Alva R. Smith	AGF Repl Depot, Ft. Ord
Maj. Desmond P. Wilson	AGF Repl Depot, Ft. Ord
Capt. Jebbie C. Billue	AGF Repl Depot, Ft. Ord
Capt. Eric A. Bruce	AGF Repl Depot, Ft. Ord
Capt. Robert A. Dix	AGF Repl Depot, Ft. Ord
Capt. John H. Halley, Jr.	432nd FA Gp, Camp Bowie
Capt. Jack Harding	624th FA Obsn Bn, Ft. Sill
Capt. Robert S. Hodson	AGF Repl Depot, Ft. Ord
Capt. Elmore M. Hoff	432nd FA Gp, Camp Bowie
Capt. Lowell D. Jepson	FAORP, FARTC, Ft. Sill
Capt. Jack Kron	AGF Repl Depot, Ft. Ord
Capt. Norman H. Oliver	FAORP, FARTC, Ft. Sill
Capt. Arthur Tait	AGF Repl Depot, Ft. Ord
Capt. Herbert H. Vreeland	AGF Repl Depot, Ft. Ord
1st Lt. John M. Brown	Borden General Hospital
1st Lt. Robert F. Buchheim	432nd FA Gp, Camp Bowie
1st Lt. Harker A. Crow	FA Pilot Training, Sheppard Field
1st Lt. Joseph A. Dubnicka	432nd FA Gp, Camp Bowie
1st Lt. Howard H. Gerrish	AGF Repl Depot, Ft. George G. Meade
1st Lt. George H. McKelvey	AGF Repl Depot, Ft. Ord
1st Lt. Neal H. Tracy	214th FA Gp, Ft. Sill
1st Lt. Albert E. Wahlke	AGF Repl Depot, Ft. George G. Meade
2nd Lt. Paul H. Black	FA Pilot Training, Sheppard Field
2nd Lt. Henry M. Francis	ORP, Ft. Benning
2nd Lt. Frank A. Underwood	AGF Repl Depot, Ft. Ord

WEARING OF CARBINES IN POSITION AREA

The working by gun crew personnel with carbines in slung position causes interference with the proper and efficient performance of duties and injury to personnel, the carbines, and instruments on the piece.

Several methods have been improvised and used by various units for care of carbines in position area. These vary from crude racks made from branches picked up in area to prepared sawbucks with horizontal notched pieces for stacking of carbines, muzzle up.

It is suggested that carrying of any special racks for stacking of carbines only adds to multitudinous pieces of equipment carried. To avoid loss of carbines, however, there should be established in each unit routine and habitual practice as to places and methods of placing carbines—on either improvised supports or canvas—convenient for each small group (such as ammunition pit, powder pit, and piece personnel).



# TD Reconnaissance at Anzio

By Capt. Lewis A. Clarke, FA

*At Anzio our TDs had no commanding observation or field of fire such as this 3" piece enjoyed at the north end of the Maginot Line.*

## OBSERVATION

The 701st TD Bn was attached to 1st Armd Div. At least one gun company of the battalion was always employed in an indirect fire role, reinforcing the fires of division artillery. Since the battalion fire direction center was tied in by wire not only to the gun companies but also to at least a half dozen artillery battalions, there was an excellent opportunity for adjusting and massing fire on any target of opportunity that could be observed.

Initially the most difficult problem was to obtain a satisfactory field of view over the enemy's terrain. The ground was flat. Buildings habitually drew enemy mortar and artillery fire and were likely at any time to become untenable for the observer. ("To become untenable" as here used means "to be reduced to a pile of rubble.")

The solution finally adopted was to establish three OPs. One of these was set up in an abandoned American tank on the left side of the sector and about 500 yards from enemy infantry. Another was established in a house in the center of the sector, 1,500 yards from the most advanced enemy elements. The third was established in one of a group of houses on the right of the sector, about 300 yards from the German positions. These OPs were respectively named and became known as "X-ray," "Yoke," and "Zebra."

The first and last of the three OPs could be approached or vacated only under cover of darkness; "Yoke" was accessible by daylight. In all three OPs, observation was conducted through BC telescopes, either over the cupola of the tank or through a hole in the roof of a house. Two of these 'scopes had been obtained through supply channels; the third, and by far the best, had been captured from the Germans in the attack on Mt. Porchia.

## Communications

Between each OP and the Reconnaissance Company command half-track communication was established by 609 radio. Extended microphone and earphone cords up to 150 feet were used at the OPs with each radio, not as an expedient but as the only means of obtaining satisfactory communication. Because of heavy enemy shell and mortar fire, wire even just a few hundred feet in length could not be maintained from these forward OP positions. Operation of remote control units was therefore impracticable. And, since the radio would not transmit with sufficient volume from inside either the tank or a house, it was necessary to dig in the radio outside, with the antenna fully extended behind a tree or building. By using extended microphone and earphone cords in

## EDITOR'S NOTE

**The TD Reconnaissance Company mentioned here was on the Anzio Beachhead from 1 Mar to 25 May 44. As Capt. Clarke was its commander for nearly all that time (13 Mar to 7 May), he knows first-hand the matters outlined here.**

connection with radios so placed, reliable communication was obtained over distances up to five miles.

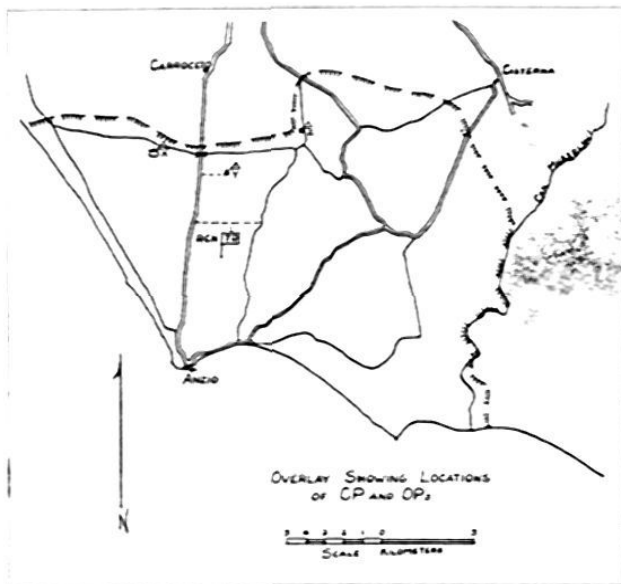
Upon location of a target the observer reported the mission to Reconnaissance Company headquarters, which relayed by wire to battalion FDC, which applied the latest metro corrections and sent the initial data with concentration number to a gun company. When the gun company was ready to fire, it contacted the observer directly on Reconnaissance Company's channel. Upon completion of the mission the gun company FDC computed and sent to the observer the adjusted data. Where conditions of visibility or the nature of the target required 155-mm or 8-inch fire, Reconnaissance Company headquarters (through battalion switchboard) contacted the appropriate FDC and acted as relay. On more than one occasion Field Artillery telephoned, requesting that a Reconnaissance Company observer adjust artillery on a target that could not be seen by their own observers.

## Personnel

Since under conditions existing at Anzio forward observation was hazardous and subjected personnel to considerable strain, it was thought desirable to develop a system which might be continued over a long period of time without inflicting undue or unbearable hardship on a few individuals. Each reconnaissance platoon organized two OP teams which rotated among the three OPs according to the following roster:

April	6	7	8	9	10	11	12	13	14	15	16	17	18
"X"	1	1	2	2	4	4	3	3	5	5	6	6	1
"Y"	2	4	4	3	3	5	5	6	6	1	1	2	2
"Z"	3	5	5	6	6	1	1	2	2	4	4	3	3

It will be noticed from this schedule that each OP team received a 3-day rest after two days' duty at "X-ray," a two-day rest after two days at "Zebra," and a one-day rest after two



days at "Yoke." At first glance the system may seem unduly complicated, but it worked in a most satisfactory manner.

At a time when artillery units were urgently requesting additional officers for use as forward observers the company, using only two officers, was able to maintain three OPs constantly for ten weeks. The sergeants did an excellent job in locating targets and in adjusting fire, and there was always sufficient officer and non-commissioned officer personnel with the company to handle other duties when necessary.

Distribution of work among six teams produced other benefits. Every man in the three platoons became familiar with the terrain to our front. Although a few men were wounded, there were no cases of battle fatigue, either from too much hazardous duty or from thinking about such duty too long in a rear area. OPs which were "too hot to handle" by the same personnel for long periods were manned constantly.

#### *Locating targets*

Finding the map location of targets was unusually difficult since observation was had only from low ground. It was not uncommon for Reconnaissance Company observers (or even for experienced artillery observers) to miss the map location of distant targets by as much as 2,000 yards. In such a situation the artilleryman would undoubtedly adjust with smoke and thus be able to correct his initial error within a few rounds. But where the tank destroyer observer made even a lesser mistake in the original map location of the target, the rounds would never be found. The lack of a satisfactory smoke shell proved always a serious handicap to the observer of tank destroyer fires. To gain accuracy in the initial location of targets, the following procedure was used:

The 0-3200 line of the BC Telescope was set on the factory tower at Carocetto. (This was shown on all maps of the area.) When a target was located the reading on the telescope was noted, and the angle between the factory tower and the target was marked on the map by using a protractor or small range fan. The observer's task was thereby simplified into locating the target along the ray which he had drawn on his map.

#### *Sensings*

Since the observer often did not know the location of the

artillery battery firing his mission, and since observation was had only from low ground, even the most experienced observers were compelled to be constantly mindful to establish the gun-target line on the ground and to obtain a range bracket before calling for fire for effect. All personnel were familiar with these rules, but some observers were careless in their application. Where a mission was completed without a satisfactory range bracket, or where an observer had "jumped" his range or deflection bracket, an officer from the company would discuss the mission with the observer after dark. The discussion usually developed into a campaign to convince the observer that the firing element was not guilty of the error involved. Additional help was given the observers by practice "firing" on a terrain plot which had been constructed in the company bivouac area.

#### *Fire Direction Center*

All observers from low ground have a tendency to underestimate the range error. Under such conditions, personnel at the FDC may attempt to think for the observer. This practice proved confusing to the observer. By changing a sensing of "200 short" to "400 short," unknown to the observer, the fire direction center in the long run will waste time and ammunition.

#### *Locating Enemy Guns at Night*

At both "Yoke" and "Zebra" the 0-3200 line of the BC 'scope was set on the factory tower at Carocetto before dark. Watches of all observers were synchronized. When an enemy gun or battery fired, the reticle of each scope was centered on the flash. The observer noted the reading of the instrument and the time. Since the location of each observer and of the factory tower was known to the fire direction center, the observer was required to make only a brief report indicating the reading of his instrument and the time; for example, "Flash 6215, time 2319." Observers from division artillery were also engaged in this work, with the result that sometimes several rays were obtained intersecting at an enemy battery position. Although the method is not foolproof, locations obtained in this manner, when checked with those of the sound and flash battalion operating on the beachhead, proved highly accurate.

#### AREA RECONNAISSANCE

On numerous occasions Reconnaissance Company was called upon to reconnoiter for indirect fire position areas for the gun companies. In doing this work, two factors were always important: the condition of the ground, and the minimum elevation.

After returning from such a mission, the officer or NCO in charge prepared an overlay showing areas where the ground was too soft for supporting the M-10, where enemy artillery fire fell most heavily, where the best minimum elevation with flash defilade could be obtained, and so forth.

Each reconnaissance platoon had one clinometer and a couple of minimum-elevation cards. These were used habitually in the selection of indirect fire position areas.

#### LIAISON

During the entire period, Reconnaissance Company maintained between one and three liaison groups with adjacent units. The work was a part of Corps' antitank warning system. Here again, personnel were rotated. A crew of four men were given such a job for a week at a time. Radio contact was maintained with Reconnaissance Company's headquarters. Positive reports of enemy activities were sent in when received; negative reports were submitted on every even hour. The



Company's first sergeant, communications sergeant, and others received turns at this work.

#### AIR OBSERVATION

During the time at Anzio, the leader of Pioneer Platoon flew over 40 missions with Division Artillery's Liaison Pilots. These flights were made for the purpose of adjusting guns on base and check points.

#### CONCLUSION

It is believed that the work of Reconnaissance Company during the period in question demonstrates that:

(1) Effective use can be made of such a company even where the front is stabilized.

(2) Efficiency and morale will be served best in the long run by permitting the largest possible number of men to engage even in specialized work.

(3) Reconnaissance Companies should beg, or borrow, a sufficient number of BC 'scopes, clinometers, and protractors, and several hundred feet of microphone and earphone cord.

(4) A white phosphorous smoke shell is urgently needed by Tank Destroyers for use in this secondary (reinforcing) role.

(5) Great emphasis in training should be placed upon locating targets, sensing fire, and operation of radios.

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## T.D. BATTLE LESSONS

1. Digging of gun positions and two-man foxholes is an SOP in our Towed T.D. Company. When subject to small arms and artillery fire it is impossible, however, for the men to leave their holes and man the guns without exposing themselves. To remedy this condition we've been digging shallow communication trenches between the holes and the gun positions.—*Pfc. Francis Neuwirth*

2. With the Ammo shortage as acute as it is something must be done to conserve. Here are some helpful hints:

*a.* Make sure that all ammunition is sufficiently covered in the gun pit. Rain and inclement weather will in most cases swell the casing and make it difficult for the shells to fit into the breech of the gun. An old shelter half or a tarp will prevent water or dampness from reaching the shells.

*b.* Another important point is the proper marking of all types of 3" ammo. For instance, concrete piercing is a converted shell and does not have a case designated as such. I suggest marking the case in paint or chalk. This prevents the gun crews from making the mistake of putting the wrong shell in the gun.

*c.* Every man should be informed on all types and kinds of ammo. He should know the effect of the different types and should be able to identify each shell in darkness. Classes on description, characteristics, methods of fire, and effects of ammo will help each man considerably.—*Cpl. H. Glantz*

3. Radio Communications.

*a.* *First echelon of the set.*—Too often we find that the driver and his officer or NCO in charge don't take proper care of the set. The radio isn't checked before operation, such as to see if the lead-in wire is securely fastened to both the mast base and the set itself, antenna sections screwed tightly together and taped, panel meter checked for filament and plate reading. The set is left exposed to all kinds of weather (we don't have covers, but a shelter-half or raincoat could serve the purpose). Moisture gets in and shorts out the set. Mikes should be put in glove compartment when not in use: once they become wet the carbon granules stick or the switch corrodes, affecting operation.

*b.* *Remote control.*—We have failed to make full use of this. During an artillery barrage when the radio cannot operate without danger to its operator, the RM-29 can be employed by adding an extension to it. Plug the extension in the set and carry the RM-29 to the nearest foxhole or shelter. Then by using a TS-13 or T-17 and HS-30 the radio is operated from the hole or shelter. Keep it as dry as possible.

*c.* *Cross-beaming by the enemy.*—During our training in the States this was stressed too much without a full explanation of just how it was done and how much equipment it took to do it. As a result some of our operators still worry about it and are afraid to leave their sets on.—*S/Sgt. Lanferman*

4. In laying wire to guns we find it saves time and troubleshooting to lay one line to each gun. In case of a short or break in line to one gun, you still have communication with the other sections. This also saves time in trouble-shooting. You still use the same amount of phones or RM-29s by putting the four ends in the one phone or RM-29.

—*T/5 J. B. Wood*

5. I find that for a section post the best bet is a 3-man trench in V-shape with half overhead cover. In it should be a machine gun, bazooka, and rifle. It has to be dug so you can control the oncoming traffic, whether enemy or friendly. Communications means to be in contact with your whole organization, and should be maintained and checked at all times.

—*Sgt. J. A. Coveart*

6. Experiences with the 3-inch gun.

*a.* Keep only 3 men and commander on gun when firing. Others should be under cover or in fighting holes, until called for.

*b.* Put a strong top on ammo pit, and straw or planks on bottom.

*c.* When using telephone for communication lay 3 wires over different routes to keep communication intact.

*d.* When in position, contact units on flanks and inform them of your position and find out what they have for support. Make sure they have the same password you have.

*e.* When time allows, dig communication ditches between gun, ammo pit and crew dugouts.—*Sgt. R. Lopez*

7. During the fighting for Aachen we were on a holding position on the outskirts of a small town only a few kilometers from Aachen. The only action we encountered at this position was enemy patrols at night. There was an exceptionally thin line of infantry on the line, which enabled the Jerrys to maneuver quite freely. They would come in firing their auto weapons wildly, joined by machine guns firing wild from pillboxes. They were the first patrols that we encountered and they made us quite nervous at first—which of course was their intention, we figured out after a few nights of it. My conclusion on patrols is: if your men are alert and prepared to meet such tactics, you need not fear this type of patrol.

—*Sgt. Welch*

# ARMORED WIRE

By Maj. Arnold M. Anderson, FA

Perhaps the most outstanding "Battle Experience" recorded by our battalion during the month's operation was the comprehensive wire net necessitated by this unit's assignment.

As "DS CCA," the battalion became direct supporting artillery to the four line units of the Combat Command (two tank battalions, a combat engineer battalion, and a cavalry reconnaissance squadron). Trunk lines to these supported units and the combat command headquarters plus seven observation posts were required in addition to the usual three firing battery trunks and local lines. In addition, two assault gun sections from the supported tank battalions were attached to the battalion as batteries "D" and "E" for two extra trunk lines. Incoming lines laid by division artillery and two reinforcing artillery battalions and two OP lines laid by a tank battalion were also tied into the battalion wire system.

This network, as shown in the accompanying line route map, required a forward switching central as well as the main battalion central. The main central consisted of two 12-drop (BD-72) and one 6-drop (BD-71) switchboards. The forward central was a 12-drop (BD-72) board. Not shown on the map are the direct lines laid by each battery direct to FDC. The total wire outlay by the battalion was in the neighborhood of 60 miles.

It is interesting to compare this installation with the T/O & E figures for wire sections of an armored artillery battalion.

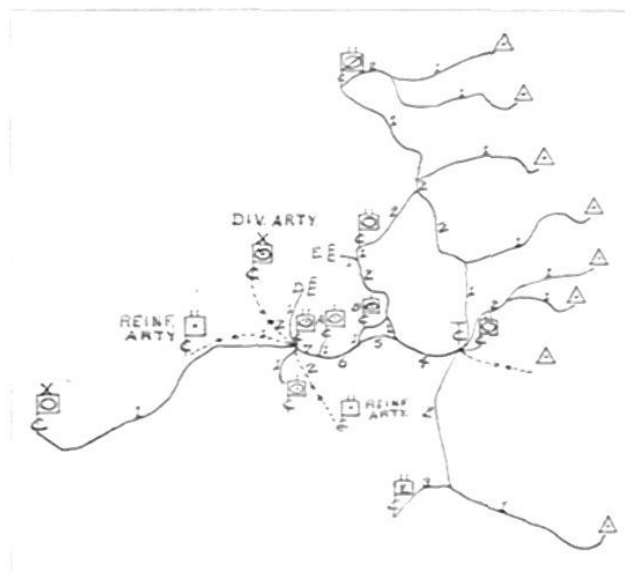
## PERSONNEL

### Headquarters Battery

1 Wire Corporal  
1 Lineman  
3 Telephone Operators

### Each Firing Battery

1 Wire Corporal  
1 Lineman



Line Route Map of 212th Armd FA Bn as of 20 Feb 45. Scale approximately 1:110,000

## EQUIPMENT (MAJOR ITEMS)

Headquarters Battery	Each Firing Battery
1 BD-72 Switchboard	2 Miles W-110 Wire
2 ½-Ton Wire Trucks	12 EE-8 Telephones
1 RL-26 Reel	1 RL-31 Reel
10 miles W-110 Wire	1 RL-27 Axle
10 EE-8 Telephones	
2 RL-31 Reels	

It is obviously necessary to draft personnel from other sections to install and maintain wire nets of this type. Extra equipment and wire required for such nets have been "acquired" by the Commo.

# TIME FIRE OVER TANKS

By Lt. Col. David G. McIntosh, III, FA

On 17 Aug 44 this battalion participated in a tank-artillery demonstration in which time fire was placed above advancing tanks. Between battles a small stretch of terrain about 800 yards in depth and 300 yards wide was cleared of civilians and soldiers, both British and American. Registration (both impact and time) was completed prior to the start of the demonstration. The height of burst was adjusted to approximately 30 yards air.

Upon signal the tanks moved forward. After they advanced about 200 yards time fire was started and kept above the tanks until they reached their objective. Five medium tanks advanced, completely buttoned up, and upon reaching their objective remained on it while a like number of light tanks advanced similarly.

About midway during the advance of the medium tanks three graze bursts occurred. Height of burst was then raised an additional 10 yards and fire for effect continued. Just prior to the light tanks' reaching their objective there was a recurrence of graze bursts. Out of the last 12 rounds fired approximately four were grazes. This condition is liable to occur in spite of the most careful initial adjustment. A total of 72 rounds were fired, of

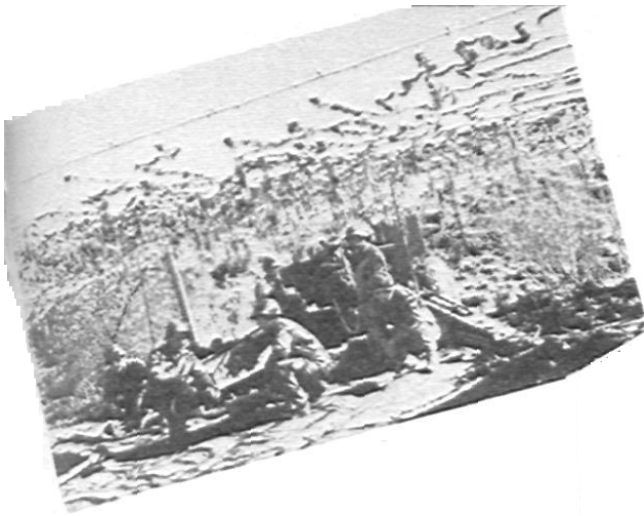
which 10 (or approximately 14%) burst on impact. In order to minimize the possibility of graze bursts, a height of burst of not less than 40 to 60 yards in the air should be employed initially.

Upon interrogation of the tank commanders at the termination of the exercise it was discovered that fragments actually hit three of the five medium tanks used without damage to any of them. None of the light tanks was hit.

There are four prerequisites for the use of such tactics, the absence of any one of which renders the operation impractical: (1) a ground observation post at sufficient distance from the impact area to enable an observer to properly adjust the height of burst prior to advance of tanks, (2) enclosures (or fields) of sufficient size to allow tanks to maneuver, (3) a limited objective for the tanks, and (4) sufficient time for proper coordination between tank and artillery commanders.

From a training standpoint it is felt that the tank crews will gain greater confidence in their supporting artillery if subjected to this type of battle indoctrination. Artillery observers will learn to visualize the proper height of burst (which is, of course, much higher than that normally used) and maintain control of the fire for effect through constant surveillance.

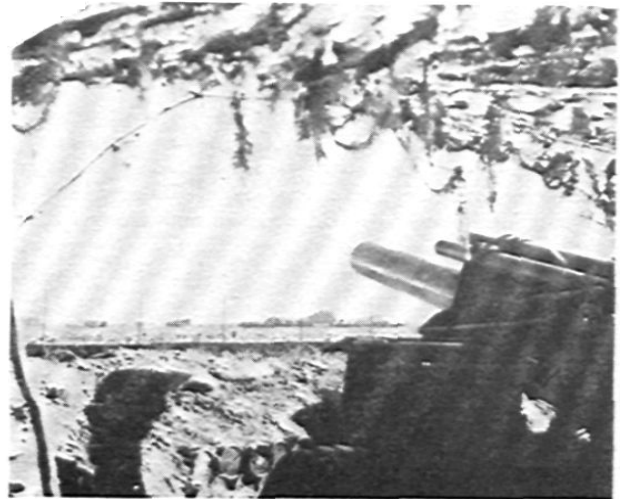
## 155—HOW COMBAT POSITIONS



*A taut, well-erected flat-top*



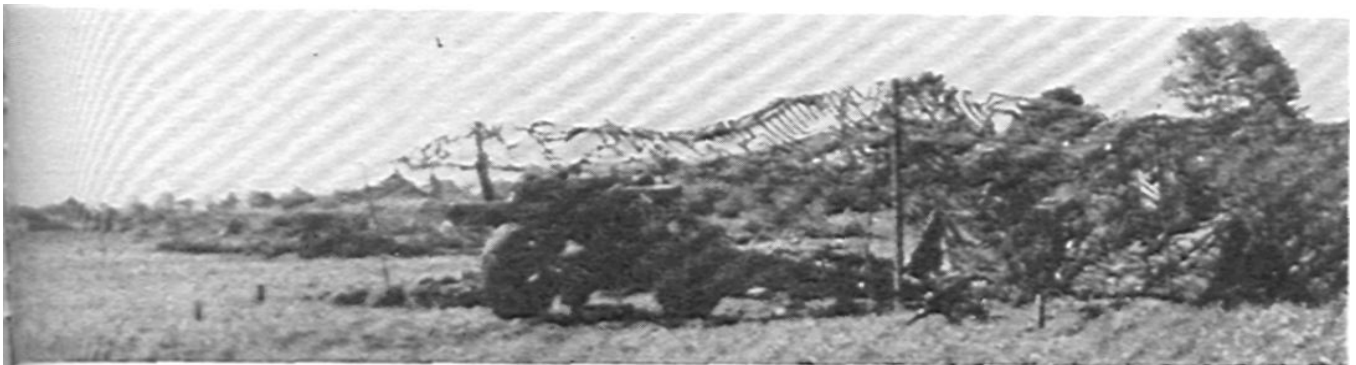
*Near Luneville*



*This position is among trenches where our 1st Div fought in 1917. U. S. troops had more hot fighting here last September. Note ammunition containers in revetment.*



*Camouflaged positions in a French municipal race track*



*Flat-tops furnish ideal camouflage from the air in such open terrain.*

# WITH CARBINE AND TRANSIT

(The author's apologies to Col. Wilbur S. Nye whose *Carbine and Lance* is a Field Artillery classic.)

By Maj. E. A. Raymond, FA

## HISTORICAL NARRATIVE

Fifth Army Engineers brought survey control to the Anzio Beachhead by heliograph, using islands off the coast. Elements of VI Corps Topographic Company landed on D+3 to reinforce the Field Artillery Observation Battalion, elements of which had taken part in the initial landings. The work of these units illustrates certain phases of artillery employment which are all too often overlooked.

Btry B of the Observation Battalion was selected for the initial operations at Anzio. The D-day party consisted of 3 officers and 40 men; the battery was attached to a "Long Tom" outfit in order to direct its fire by sound. By much arguing the battalion commander had obtained authorization to include survey personnel in the advance party, so a survey officer together with two sound ranging officers rode in the assault wave on an LCT.

This personnel had the mission of pushing inland to reconnoiter for a sound base and to plan preliminary survey. Equipment and the rest of the advance party came in on the second wave. The three lieutenants in the assault wave had two jeeps. The craft dashed up to the shore. A sailor called back a sounding of 18". As Lt. Roland drove forward off the ramp a wave picked up the LCT and the jeep dropped into five feet of water. The lieutenant and his driver grabbed a mine detector from the jeep as the officer's bedroll—containing the only air mattress in the battery—floated off.

The second jeep met almost the same fate. This time the vehicle disappeared, leaving its passengers sitting with heads and shoulders out of water. The second jeep was running again in four or five hours, the first one the next day. The advance party was attached initially to the medium battalion of the 3d Inf Div and started to lay out a sound base about five miles from Anzio the same day. It ran perpendicular to the Rome Highway. The first sound location was made at 1125 on D+1.

Seven men started the survey from an initial point at 85.3-20.4 (Tre Concelli Crossroads). They proceeded to survey in a sound base, using coordinates scaled from a 1:25,000 map and an azimuth from solar observation. Upon completion of the sound base a traverse was extended westerly to the Rome—Anzio Highway, the survey officer intending to tie in to the primary trigonometric point SI 178. This point could not be found, however, and plans were made to tie in to the Anzio Lighthouse instead. This was a low order survey point, but the only one available in the area.

The remainder of B Btry sat in the harbor on an LST and observed the tactics of German dive-bombers from 1500 hrs. on D+3 until 1000 hrs. on D+4. Fellow passengers were parachute troops bound for the southern portion of the Beachhead. The landings were uneventful, and the battery was assembled in bivouac at 1600 hrs., and was attached to the Long Toms. It served a 37-mile front.

On D+5 30 men and 3 vehicles of the Corps Engineer Topographical Platoon arrived to establish better survey control. The observation battalion survey officer contacted this group and requested control on the Rome—Anzio Road, to tie in to the

traverse originally run west of Tre Concelli. The topo platoon established this by using the Anzio Lighthouse (the low order point) and an azimuth from Polaris, then traversing up to tie in with the observation battalion control. Thus on D + 6 the observation battalion was on true Corps control. Azimuth on the original traverse was found to be correct, and coordinates were corrected.

The topo engineers spent some time looking for the Primary Trig Point SI 178 north of Anzio, but after a long search had to give it up as missing. Italian survey had been accomplished many decades back. Presumably the original markers had disappeared many years ago, and trees had grown up and obstructed the old rays. It was finally decided that an enemy artillery unit had installed a gun position on or near the control point, destroying it completely.

On D+2 a German trig list of points on the Anzio Beachhead was captured, but since the points were on the German grid they could not be used until the Army Engineers worked up a formula to convert them to the British South Italy (Army) grid. By the time these points were recomputed the Beachhead survey was completed, therefore this trig list was not as valuable as it might have been.

The country was too flat and wooded for triangulation. Accordingly, on D + 5 the B Btry survey party ran a traverse up the Anzio—Rome Road, tying in to a flash base in the vicinity of the overpass (later one of the hot spots of the Beachhead) and surveying in a sound base to the east of this point. Traverse points were numbered and descriptions written, and tags with station numbers affixed. The Corps topo platoon also established a point near the overpass by traverse, which checked the observation battalion's work.

On D+8 a traverse was run northeast from Tre Concelli Crossroads to Le Ferriere (reached on D+14) and the Mussolini Canal (reached on D + 18). The survey crews worked down the roads, and were pinned down by shell fire twice and strafed once during this operation. No casualties were suffered, however, the survey crews having learned on the southern front the advantages of cover and how to be fast on their feet. The Corps topo platoon also tied in to the end points of these traverses and checked them.

As each Corps Artillery battalion arrived at the beachhead, its survey officer was contacted by the observation battalion survey officer and given a Corps control point near his battalion position. The division survey officers were also contacted, and at no time did a gun battalion have to survey more than five hundred meters to reach its battalion area.

All battalions were thus on common survey control, which made it possible to concentrate all guns on the beachhead on a given target—a tactic used very often on the beachhead. It also made it possible for gun battalions to fire on the flash and sound targets with a minimum of adjustment.

Meanwhile B Btry of the observation battalion had been active over what was shortly to become one of the most savagely contested areas of the war. Little artillery fire was encountered, most of it from scattered 88s. These were the

chief targets for our (the Corps') 155-mm guns. An OP was located 500 yards northeast of the main crossroads on the Rome Road, and the Flash CP was set up in a long stone barn 1,000 yards to the east. Personnel drove in jeeps to the Factory and all around it.

The battery had observation on Cisterna on the night of 1 Feb, when two battalions of Rangers were lost. The Germans opened up their lines, let the Americans through, and swallowed them. The 1st Armd Div was carrying out a simultaneous attack up the Rome Road. The 1st Armd advanced easily, smelled a rat, stopped, and had to fight its way back.

The remainder of the battalion landed on 2 February (D+11), looped all traverses, and made a complete adjustment of all existing control on the Beachhead. It found two sound bases and a 4-OP flash base on Campo Carne, 3,000 yards back of and parallel to the front lines. Btry A took over the western sound base and B kept the eastern one. Each battery started a second base, A near B's initial installation and B toward Point Astura. Both batteries extended their bases to give all-around sound and flash observation—an installation of just double the normal size. That was the situation on D+25 when one battery of a British Survey Regiment came in to help. The British took over from the 88th Easting west to the coast, and paralleled A's south base with a sound base 500 yards to the north. Both bases were operated, giving dual coverage. Using different equipment and slightly different techniques, the results produced were remarkably similar.

Friendly air activity increased sharply in early February. On the 14th the Jerries brought in some 170-mm guns and shelled the house at B Btry's flash OP3 so violently that the OP had to be abandoned. Fire was drawn to that point by the large number of infantry and the tanks and TDs which clustered around the observation post. On 15 Feb the CP received six direct hits by large caliber shells.

The 16th was the opening day of the Germans' big attempt to crush the Beachhead. The observation battalion was first made aware of the impending storm when a tank pulled up to within 1,000 yards of the "A" flash CP and fired 30 rounds by direct fire. The building was hit six times, but no casualties were suffered. There were repeated shellings in this area throughout the day. The shelling increased on the 17th, and so much difficulty was experienced with the wire lines that the flash platoon decided to move its CP. Accordingly, at 0800 hrs. it moved 1,000 yds. east to OP1. Finding no communications there either, some problems were fired by forward observer methods for tank destroyers in the vicinity which were temporarily without observation. At 1000 hrs. the Germans shelled OP2 with heavy artillery, obtaining two direct hits on the house and forcing the observers to withdraw. The jerry fire was then shifted to OP1, which also received two direct hits of heavy caliber. By now enemy tanks and infantry were about 1,500 yards away, in different groups—one of perhaps 200 infantry with 20 tanks. The Germans in this section were being hit by every gun on the Beachhead which would bear, and nearly 1,000 Fortresses and Liberators were unloading personnel bombs from as early as dawn would permit until dusk grew too dense to see. The Germans kept on coming, avoiding burning tanks and vehicles and dodging occasional falling planes as they came.

An A-20 coming in on fire lost its load of 30-lb. bombs over the CP. The Luftwaffe put in an appearance with 12 JU-88s firing rocket bombs. The battalion saw six shot down. Since conditions did not permit further flash or sound ranging from his advanced installations, the battalion commander effected a daylight withdrawal of all personnel and equipment. No casualties were received on the withdrawal. One shell fragment hit one truck.



*Although sound-ranging principles are well established, details of equipment differ among the several armies. Here are shown some British elements. In photo at upper left appears a bombardier in his well camouflaged dugout, serving as an outpost. Being well forward of the line of microphones, he can give warning to start the recording apparatus to functioning. One of the microphones (usually there are six per are) is shown at upper right. Each is placed in a special, dug-in container, covered with matting, and then camouflaged. The "story" of what each microphone "hears" is recorded on a calibrated tape of sensitized paper, through use of photo-electric cells. From the resulting graphs (see lower left) are determined data for plotting. Lower right shows a plotting board, with strings being placed according to the microphones' readings so that their intersection will locate the enemy gun being located.*

Btry A moved back, took over B's northern base, and put in an east-west base to the south. These two sound bases crossed each other, permitted use of the same sound central for both of the bases, and required the addition of only one outpost and four men. B operated one sound base and a flash base. It later found that the sound base was too far back: most of the Germans' heavy guns which were shelling Anzio were firing from the east at long ranges. B moved east 5,000 yards and tilted its sound base up in a north-south direction.

When the Boche found themselves unable to smash the Beachhead from the north they regrouped and tried again from Cisterna, to the northeast. One of the forerunners of this second push was a surprise job at the 45th Inf Div. A's flash base lost all its wire lines in the preparation, and switched to 610 radios. The attack which followed the German preparation caught our infantry off balance and came through our front lines to within 2,000 yards of all four A Btry OPs. All four were busy firing forward observer problems at the same time. They averaged 15 missions apiece for the day and stopped one force of 10 Jerry tanks and 100 infantry within our own lines.

Army Survey Engineers for the Anzio Beachhead operation were a South African unit which had had a wealth of experience under Gen. Montgomery in the desert. Under Capt. R. Hill and Lt. H. A. Ruddock, the South Africans placed a heliograph reflector at a control point near Sessa Aurunca on the main Fifth Army front and pointed it toward the island of Ponza, due west of Naples and some fifty miles from Sesse. Parties had been sent from Anzio to Ponza and also to Acoli. The Acoli party kept a heliograph reflector directed at Ponza. A party on top of a water tank at Anzio did the same thing. The Anzio party could see Arceo from the tank. The Ponza group returned all heliograph rays, and in addition got sight rays to Circeo and Ventolene. On the basis of this exact location of the water tank made on 18 April 1944 eleven main Army Control Points were established. At least a dozen South Italy Grid Stations in enemy territory were recovered, and were used in extending survey forward when our forces broke out of the Beachhead on "Operation Buffalo."

The Corps Grid was tied onto Army Grid by position and azimuth ties to eight of the Army Control Points. It was found to be accurate to one part in 5,000. Fort Sill standards for accurate gun position locations require, in carrying both direction and distance, an accuracy of only one part in 1,000. It was therefore concluded that for artillery purposes the computations necessary to adjust the Corps Grid to the absolute Army Grid were not worthwhile. It was found that the Anzio Lighthouse point, from which all Corps control originated, had been located with an X-line error of 2 meters and a Y-line error of 9 meters; this was a piece of luck. As might be expected in traverse survey control, errors were not consistent over the whole Beachhead. The Corps Grid was in closer agreement with Army Grid in the eastern and northeastern sectors. Since azimuths were frequently checked using astronomical means, this error would not be cumulative and therefore not serious.

#### CONCLUSIONS

The following conclusions represent a consolidation of the views of Lt. Col. Richard T. Nichols, FA, commanding the Observation Battalion at Anzio, drawn from his experience

there.

On the Anzio Beachhead the battalion learned that it is highly desirable to have army control for any initial survey operations. That is, the Army Engineers should arrive shortly after D-day and establish the base control from which artillery surveys can be executed. This makes for a minimum of recomputation and a maximum of accuracy of survey. Coordination of the work of the Observation Battalion, the Corps Engineers, and the Army Engineers should be made part of the early planning of an operation and not be improvised piecemeal on the battlefield.

Need for close coordination and liaison runs forward as well as back and sideways. Before proceeding to establish survey control, it is standing operating procedure to contact the Corps Artillery Section and find out as much as possible about the situation, probable artillery battery positions, and probable lines of advance. This gives sufficient information to plan the traverses and triangulation points so that artillery battalions will have a minimum of survey to do to tie in to Corps control.

On the main Fifth Army Front the battalion learned that too much stress had been placed in the States on traverse surveys and not enough on triangulation. Triangulation is still regarded as of primary importance, although its use on the Beachhead was impractical. Triangulation is the only possible way to work in mountainous terrain, exposes fewer men in the area close behind the infantry, and, with adequate control from Army and Corps Engineers, provides a high degree of accuracy by the rapid method of a 3-point resection. A minimum of men go into the field, and their notes are then worked up by regularly assigned computers working under favorable conditions under the direct supervision of a competent officer.

There was no choice of methods at Anzio, however. Due to the flat, wooded terrain, it would have necessitated building 25-foot towers to carry ahead control by triangulation. Time being a limiting factor, random traverses were run to each artillery battalion and later looped and adjusted. When the front did stabilize and time did permit the execution of triangulation, smoking by friendly troops prevented the required observation.

A Survey Information Center was not set up in the T/O & E of the Battalion at the time, but proved to be essential in disseminating survey control information to the artillery units of the Corps. The S.I.C. collects all available data from the Army and Corps Engineers; makes an overall survey plan for the artillery battalions; and computes and checks the survey of the observation battalion. It has proved invaluable to artillery battalions in many ways. Flash OPs, when not otherwise engaged and when visibility permitted, took azimuths to selected points in the target area; these were plotted, computed, checked, and indexed for artillery use at the S.I.C. All information was given out through personal contact and not through communications. This provided security and insured a clearer understanding of the picture presented. Personnel consisted of a Battalion Survey Officer, Master Topo Sergeant, three Corporal Computers, a Corporal Draftsman, and a Clerk. These were drawn from the battalion, as were one 2½-ton truck, one ¾-ton weapons carrier, a CP tent, and necessary equipment and supplies.

The battalion had to change some of its methods and procedure since coming overseas. It found the following changes profitable on both fronts:

HEADQUARTERS  
15TH FA OBSERVATION BATTALION  
APO 19, US ARMY  
SUMMARY OF LOCATIONS, MISSIONS, AND REGISTRATIONS  
FOR COMBAT TIME 1 NOV 1943 THROUGH 30 APRIL 1944

Mon	SOUND				FLASH				FLASH REGISTRATIONS		
	Btry A		Btry B		Btry A		Btry B		Btry A	Btry B	
	Locations	Missions*	Locations	Missions*	Locations	Missions	Locations	Missions			
Nov	137	77	64	42	14	10	50	44	6	15	
Dec	306	51	94	33	38	31	58	47	5	11	
Jan	186	73	33	0	9	9	20	20	1	1	
Feb	233	34	387	33	90	75	84	57	2	10	
Mar	231	11	279	4	68	61	85	60	2	10	
Apr	130	33	178	25	48	47	63	62	4	21	
Total	1,223	279*	1,005	137*	267	233	360	290	20	68	
TOTAL SOUND LOCATIONS.....				2,228	TOTAL SOUND MISSIONS.....				416*		
TOTAL FLASH LOCATIONS.....				627	TOTAL FLASH MISSIONS.....				523		
TOTAL LOCATIONS.....				2,855	TOTAL MISSIONS.....				939		
TOTAL REGISTRATIONS.....				88							

\*Not all Sound Missions (locations fired) were reported.

- (a) No night surveys.
- (b) No Wye levelling.
- (c) Smaller survey parties.
- (d) Central control of computations.
- (e) Coordination of survey control for artillery units.

SOUND

All sound bases during the Anzio operations were 4-second straight bases with five or six microphones. In selecting sites for sound bases, it was found to be absolutely essential to stay away from potential targets of enemy artillery and to avoid placing the microphones too near friendly artillery. These must be major considerations, in addition to topography, because microphones will pick up both friendly and enemy artillery as well as shell bursts.

Where time and other circumstances permit, having an alternate base surveyed in its good insurance.

A sound outpost should have a minimum of four men, rather than two men as called for by T/O & E. All stay forward together and each works a 6-hour shift. On the Beachhead, with double bases in operation, there was practically no personnel to relieve them and they remained forward a couple of weeks at a time. A 5-man team permits rotation, and every day one man can return to the sound central for a rest. This is considered desirable not only because sound outposts are well forward, in order to hear enemy guns, and the men are under a considerable strain, but also because the work is difficult and exacting and requires a high degree of mental alertness.

FLASH RANGING

Flash bases manned on the Beachhead were patterned after the standard four-OP corps installations, with only a few deviations dictated by the terrain.

Alternate OPs were surveyed in to permit displacement with a minimum loss of observing time. With the large amount of enemy artillery opposing the beachhead frequent shelling often forced temporary abandonment of OPs. So also did enemy counterattacks.

Flash survey personnel were trained to fill operations positions and provided relief for operations personnel. They also assisted in surveying sound bases.

It is thought that flash teams should work with Corps Artillery S-3 when Corps controls and clear the fire of the battalions.

It was found that if the flash central kept all known hostile battery locations plotted directly on the flash plotting board, counterbattery fire could be delivered in a minimum of time on any battery becoming active. Often only one OP could observe an active gun at a particular time and an accurate azimuth from the single OP when plotted would pass directly through a known enemy position. This method was used frequently and often resulted in silencing enemy guns in the middle of their shooting, when valuable time would have been lost in trying to get additional OPs onto the target to tie down the range.

When several OPs reported the same target, the flash CP frequently called firing battalions directly, asked for concentration, and notified CBO afterwards. The battalions had certain ammunition allowances for fires of opportunity. This was especially necessary in shooting at enemy self-propelled guns which would pull out of a position immediately after firing and so must be hit promptly or not at all.

Although the observation battalion usually gives sensings by coordinates, sometimes a flash OP observer conducts an observed problem by regular forward observer methods. The battalion prefers giving sensings by coordinates since this method usually gets bursts on the target in one or two rounds. It does not estimate the relative position of burst and target—it *knows!* FOB privates, corporals, and occasionally sergeants, however, derived great pleasure from adjusting heavy concentrations of artillery using forward observer methods.

The battalion S-2 section was comprised of about 500 men — even the cooks turned in shellreps, and all sorts of information was collected on friendly as well as enemy artillery: vehicle movements in the target area, friendly or enemy planes brought down, fires started by our own artillery, effects of friendly TOTs, etc.

METRO MESSAGES

Full advantage was taken of recent advances in metro technique. They proved a great success.

In the stabilized situation which existed on the Beachhead after mid-February, with limited fronts, the observation battalion took metro messages for Division as well as for Corps artillery. Our messages were also furnished to the British to avoid duplication of effort.

It was found that the present training prescribed for metro sections is adequate for combat.

Fig. 1 shows a chart for extrapolation of range corrections

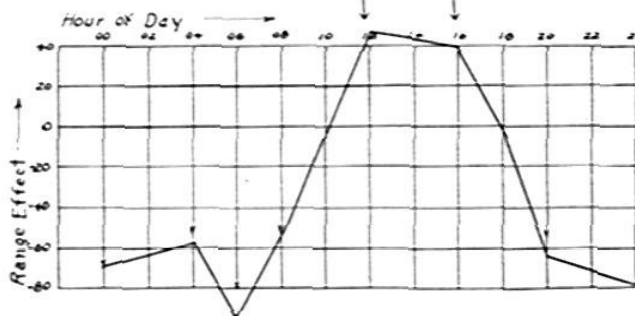


Figure 1—Metro conditions April 24-30, 1944. The above curve shows average range effect of metro conditions, on the projectile of a 105-mm howitzer shooting at 7,000 yds. along azimuth 6,400 during the last week of April. Arrows indicate scheduled metro messages; note that critical periods were well covered. Knowledge of such curves aids firing units in extrapolating for a range correction—for example, to find at 1000 hrs. the correction based on messages of 0600 and 0800.

which was worked out during this period.

#### COMMUNICATIONS

Fig. 2 indicates the complexity which the artillery wire net reached on the Beachhead. At the time the code name for the observation battalion was Voter. During the Anzio operation enemy bombing, strafing, and shelling put the wire lines out of service continuously when the lines were along roads. The small area of the Beachhead and the number of troops there, made cross-country wire laying a matter of putting lines through one bivouac area after another. As many switchboards as possible were interconnected, to provide shorter lines and alternate means of routing calls. For an extended period as many as 23 trunk lines were routed through the observation battalion's switchboard, which was supplemented by a board built up with all the spare EE-2-B units in the battalion.

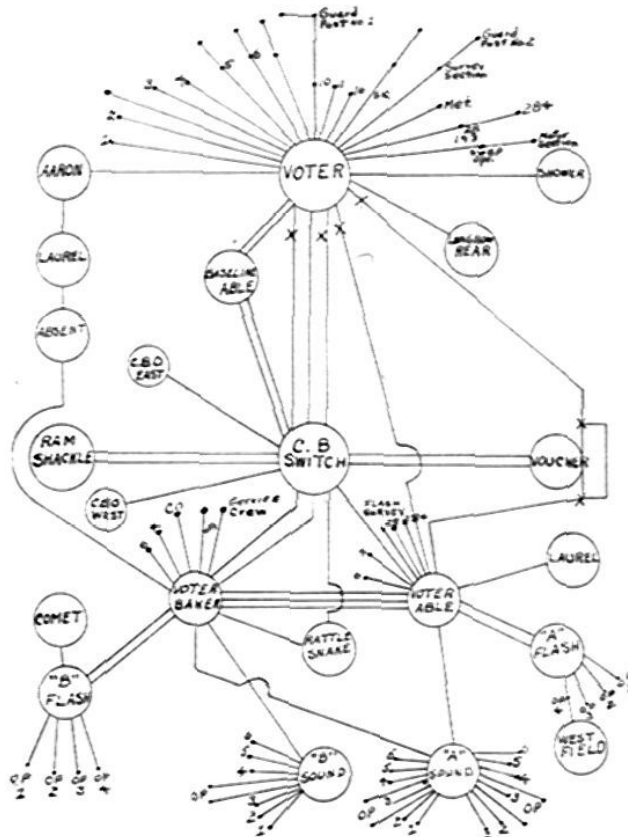


Figure 2

Due to the complex wire net phantom circuits carried a lot of cross-talk and were generally unsatisfactory.

W-110 wire proved just fair for the installation of sound bases in wet weather and when repaired in numerous places. To overcome wet lines, over 90 volts were placed on the microphone lines on rainy days and sometimes as high as 270 volts were necessary to make operations possible. In wet weather seep-water would fill the microphone holes and cause shorts; this was remedied by placing the microphones and boots in metal containers.

Each flash OP, flash central, sound outpost position, and sound central had an SCR-610 radio for use when wire failed.

## De-Tracking Targets

With V Corps—Brig. Gen. C. H. Helmick's "Long Toms" are going into the train wrecking business. Three times within 10 days the 155-mm guns of the 190th and 200th FA Bns have tangled with German trains with good results.

Feb. 20 was the first time it happened, when a V Corps air OP located a two-engined, 50-car train moving near Kall and brought the "Long Toms" in on it. The train was moving slowly and the artillery fired a battery volley, damaging one of the engines. The train made for a convenient tunnel, but proved to be too long; the engine and several cars stuck out the end. Firing again, the "Long Toms" heavily damaged the engine and bottled up the train until

fighter bombers could finish it off.

The second time it happened when some Tac/R planes spotted a train loaded with armored vehicles on Feb. 27. As the day was unsuitable for fighter bomber operations, the "Long Toms" tackled this one alone. Firing at extreme range, their first round of smoke for registration made a direct hit on the engine. The big guns followed with HE that damaged several cars and chased the train into a draw where the artillerymen couldn't reach it.

Latest venture of the big guns in the rolling stock market came March 1 when they again chased a train into the tunnel near Kall, registering direct hits on two cars and setting them both on fire.



# BATTLE OF THE TAGBONG RIVER

By Lt. William P. O'Connor, FA

Much of the significance of this engagement lies in the fact that the fight took place in more open terrain than most of our troops have enjoyed in fighting the Japanese. Except for a general outline of the division operation, the details are entirely concerned with the operations of one infantry battalion. This battalion was part of a regiment which Radio Tokyo claimed was wiped out in the series of engagements of which our story concerns a segment.

The main operation was the amphibious assault by the 77th Infantry Division at Deposito on the west coast of Leyte, P. I. Initial mission was to seize the Japanese-held port of Ormoc and then to drive north up the flat, soggy Ormoc Valley. The division hammered on the anvil held by the X Corps and thence moved west to capture Palompon, the last main port into Leyte.

It was hoped that this hazardous and bold move would bring a rapid conclusion to the already bitter Leyte campaign, and clear the way for other proposed operations. The enemy had shown clear determination to drive us from Leyte. Enemy air and sea power were used lavishly and with considerable effect almost to the end of the campaign. During the Ormoc operation several attempts were made by the enemy to land troops and supplies at Ormoc and Port Palompon. Some troops at Palompon actually succeeded in landing. Those encountered in the battle described had landed at Port Palompon about three days before they were engaged, according to guerrilla reports.

Naturally our supply problems loomed large, for at critical stages the preponderance of supplies came by sea routes that were constantly patrolled by enemy aircraft. It was determined, however, to pursue the attack boldly and make every round of ammunition count. That the plan succeeded is a tribute to the resourcefulness of the many individuals who took decisive action at critical moments.

In past operations the troops involved had not had the experience of fighting an enemy of approximately equal strength. Artillery officers had opportunities and targets the size and vulnerability of which they could hardly believe. In a short time we learned that by speed, skill, and a relatively small volume of

ammunition we could scatter and disperse entire enemy companies. On at least two occasions enemy counterattacks were broken and routed entirely by artillery fire. Most of the action was tense and fast moving, necessitating the planning and execution of artillery missions on the run.

\* \* \*

At noon on 19 Dec 44 the — Inf began an approach march from Valencia, Leyte, P. I. to the Libungao—Palompon Road. Mission of the 1st Bn was to secure the bridge at the Tagbong River, approximately 2,000 yards west of Highway No. 2. The — FA Bn was in direct support of the regiment. At about 1,500 the infantry battalion ran into slight resistance about 1½ miles south of the bridge over the Tagbong. In order to increase the pressure, the battalion commander ordered "C" Co to move to the left of "B" Co, which was then crossing a creek (Y) (see Map 1).

Up to this point the enemy fire had been coming entirely from the front, but while "C" Co was moving up sporadic mortar fire began to fall and as "B" Co moved on "C" stopped at (X), where they called for artillery support. The enemy was firing two or more machine guns from thick jungle to the left front, while the company was in an open field where some casualties had been suffered. Observation was obtained from a creek bed, to which part of the company had been withdrawn to allow room for artillery fire. The observer could see only heavy jungle across the field. The enemy position seemed to be in a semicircle to the left front at (W), but there was no evidence of exact locations aside from the reports of his guns.

A sensing by coordinates on a 1/25,000 photomap was made, and the fire was adjusted in by sound. Since the quick fuze did not secure the desired tree bursts the order for time fire was given. The observer decided to fire short fires for effect and await further indications of the enemy strength and activity. When fire to the direct front did not eliminate enemy action, a sensing was made to fire for effect immediately on the left part of the semicircle, with battery zones on an area about

## NOTE BY DIV ARTY COMDR

This article has been checked by other artillery and infantry participants. It shows, in detail, how artillery forward observers work in close cooperation with small infantry units in combat to provide accurate artillery fire, quickly and effectively, in support of the infantry.

This report should be studied by infantry and artillery alike, particularly by artillery forward observers and liaison officers. In doing so it should be remembered that our infantry was opposed by a determined force, equal numerically but with inferior infantry fire power and *without artillery support*.

Attention is called to the following:

a. Our infantry is able to advance rapidly with few casualties when enemy resistance is neutralized by artillery fire. On the other hand, it encounters serious difficulties when even small groups of organized resistance are not neutralized by superior fire.

b. In organizing artillery for combat, one forward observer party with each front line company and a liaison party with the battalion commander are necessary and adequate. Possibly one additional forward observation party (4 in all) should be provided in light artillery battalions.

c. It is essential that forward observers and liaison officers know our infantry dispositions and plans, and study the terrain and enemy dispositions, constantly. They must push ahead with leading elements of infantry where they can see the immediate situation

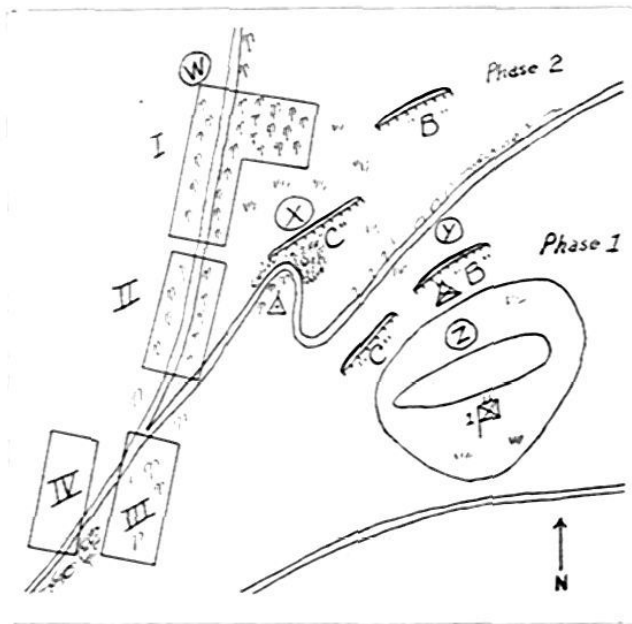
confronting their supported company in order to obtain effective fire promptly.

d. Cooperation between forward observers, coordinated by liaison officers, with all working together in the closest harmony with the infantry, is necessary. For all practical purposes artillery forward observers and liaison officers should feel that they are a part of their supported infantry battalions. This feeling should be reciprocated and fostered by the infantry.

e. The devastating effect of artillery fire on the enemy is reflected in the comparison of enemy losses to our own. This difference is not due to artillery fire alone, but artillery fire is the dominant factor.

f. Efficient cooperation between infantry and artillery was possible because (1) they had already become battle experienced in the Guam operation; (2) from the very beginning of the Leyte operation they were constantly working together against organized resistance and as a result they learned from combat experience how to do the job.

g. A lesson concerning future training of units is clearly indicated: infantry companies and battalions during their combat problems need to have artillery forward observers and liaison officers work with them just as much as they need their heavy weapons platoon.



Map 1—Action One Mile South of Tagbong

400 yards long. This fire was to neutralize the enemy for about half an hour.

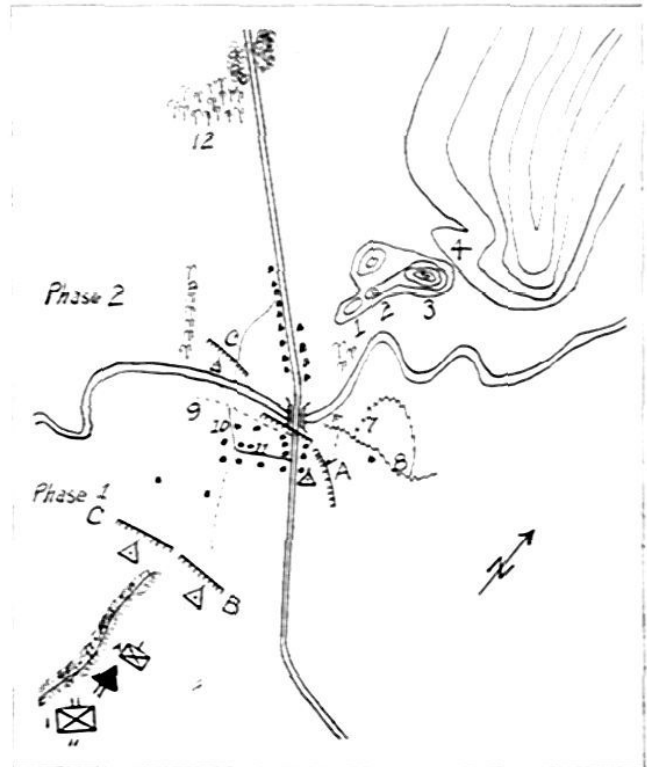
As it was growing dark the order to withdraw to a night defensive position was issued. About the time that the battalion had made its dispositions and the regimental CP had moved up behind, a considerable volume of enemy machine gun fire opened up from the left flank, further to the rear than the missions described above. This action was accompanied by the yells of at least 20 voices.

There had been time to set up artillery observation again, and a fire mission was transmitted with a sensing of 200 over on the earlier fire at II. In all, three 200-yard battalion concentrations were fired in the areas II, III, and IV, with an ammunition expenditure of about 75 rounds. This fire broke up a hastily organized counterattack; little other enemy action troubled us that night. We believed that our rapid advance had caught the enemy off-balance and that he had not been able to set up a strong, coordinated defense.

The regimental commander requested all possible artillery support for the following morning, with priority given to the 3d Bn. At the time only four light batteries were in position to support, the rest of the Division Artillery being held up by bad roads and damaged bridges. Communication difficulties slowed down adjustments so that only the preparations in front of the 3d Bn were adjusted by the time we were to begin firing. At the time the enemy's strongest position was situated in the area just west of the Libungao crossroad, which was one of the regiment's objectives. The 1st Bn Arty LnO was confronted with the problem of attacking without preparation or taking over the firing from forward observers, who had to prepare to move with the infantry. It was decided to shoot some of the night defensive fires as a preparation. Having encountered more opposition to the left than to the front on the previous day, we decided to fire about 80 rounds in an area about 600 yards long and let the troops start moving while the successive concentrations were falling. We called for one battery to mark an old concentration and immediately thereafter a 400-yard zone was swept twice. Upon completion of this fire for effect a new sensing of "300 short, fire 200-yard zone" was given. All the fire was completed in about

eight minutes and the battalion was able to jump off on schedule. Inasmuch as we by-passed the area of the first concentration we were not certain of the effect, or whether the Japs had survived the night and remained there. In the area of the second concentration, however, we did find a handful of enemy dead. We were able to advance about 500 yards before encountering any resistance warranting artillery support.

In the approaches to Tagbong village (Map 2) the leading company on the right was stopped in a row of banana plants



Map 2—Capture of Tagbong Village

(Phase No. 1) by heavy machine gun fire, while the left company, echeloned diagonally across a small ridge, was suffering casualties from mortar and artillery fire. On hindsight it is evident that it would have been better had the infantry requested artillery neutralization fire before exposing the troops at all, since resistance was expected in Tagbong. But the infantry was very aggressive during the entire 4-day battle and they did not want to wait for adjustment of artillery until there was no alternative.

Moving up with the battalion commander, the liaison party came behind the right company (Map 2), who reported that they could see more than 40 Japs hastily arranging their defenses. Since the observer on the right was under fire, a call was made to the other observer to find out if he could adjust fire from some sort of defilade. In view of his more satisfactory observation he was ordered to destroy the enemy. He began adjusting the artillery and managed to get on part of the target. As enemy fire continued to harass our troops, however, he was ordered to increase his coverage and ammunition expenditure. The battalion then fired about 150 rounds on the target in three battalion concentrations (9, 10, 11), working over the whole village. This fire so shattered the enemy that our troops were able to sweep through the village and seize the near side of the bridge without further casualties. The left company, charging in hard, made a bridgehead across the river south of the bridge. An enemy ammunition dump

which had been set on fire kept exploding for two hours. Unfortunately, many of the enemy had escaped our artillery fire, as it had become an established practice for the Japanese to take off on a dead run when they were caught in the open by artillery fire.

After seizing the bridgehead described, the infantry was again attacked by strong enemy fire. The right company held the bridge, while the third company attempted to force a crossing north of the bridge without artillery preparation. The assault was unsuccessful.

During this period, the observer across the river located many enemy targets and adjusted some fires near 4 and again near 1, when the Japs, who had occupied the village, retreated there. The artillery fire neutralized enemy action that was menacing this company, producing an estimated 30 casualties among enemy machine gun and mortar crews. The heavily wooded knoll at 1 was not visible from the near side of the river. Together with a slightly larger knoll at 2, part of which could be seen, this position proved to be the hardest nut to crack.

About this time the battalion OP was moved up to the bridge. The observer on the right had found a target on the hill (2) and had adjusted fire on this position, which had stopped the assault of "A" Co north of the bridge.

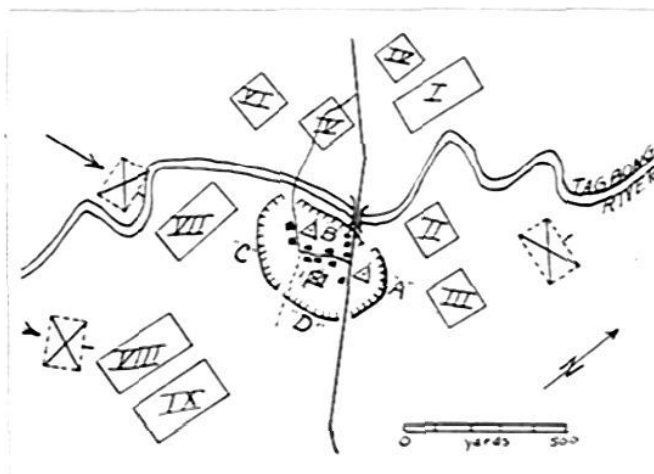
About 1300 the Air Observer we had requested came to our assistance and was extremely successful in further pounding this strong position. He found that our action had driven about 50 Japs in open retreat to the coconut grove (12). At the same time reinforcements were moving into the same area. He made no accurate adjustment, and in fire for effect worked over the whole area thoroughly with time fire. We urged him to keep firing until he could be certain that the enemy in the area had been liquidated. He fired about 70 rounds, and from later reconnaissance we are convinced that he produced more than 50 enemy casualties. This probably is underestimation, for at the time the Japs were capable of evacuating a considerable proportion of their dead and wounded. The Air Observer then fired the battalion at the hill area into which he reported the enemy was pouring fresh troops. He attacked the reverse slope where the ground observers were not entirely effective.

By mid-afternoon the extent of the resistance was apparent. We could see that we would be unable to overwhelm the enemy who had at least one battalion against us. At a later date guerrillas advised us that the enemy had thrown 1,100 fresh troops into the battle for the Tagbong River. The afternoon's experience had itself shown us that the enemy could and would continue to move additional troops against us. When the plane went home we were unable to study the scope of his operations. The Japs, on the other hand, held commanding observation from the hilltop (3). The artillery ammunition supply was such that we could not afford to interdict the enemy OP as we wished to do.

The battalion commander ordered the preparation of a defensive position. Accordingly, the company across the river was drawn behind the river into the position shown on Map 3.

Meanwhile, the company north of the road was encountering tremendous difficulty in setting up its position. The forward observer was busy trying to fend off with artillery an attack by an enemy company from the right flank. The attack was broken, but unfortunately the artillery coverage was not sufficiently extensive to shatter this force completely.

During this time the troops at the bridge received serious harassing fire from the hill at 2 (see Map 2). Being the only artillery officer free at the time, the liaison officer set up an OP



Map 3—Night Position, Tagbong Village

at the bridge. The infantry had made a study of the terrain and were able to point out the target accurately as a new facet of the hill position. A sensing was made to bring fire in this area, and time fire was requested. The first rounds were "air short" and close enough to allow fire for effect immediately. Since the whole extent of the target was uncertain, it seemed that the best solution would be zone fire. A 200-yard zone fired twice by one battery chopped up the whole area. This was so effective that the infantry were able to complete their preparation of the night defensive position without further harassment.

Upon his withdrawal from the far side of the river the left observer was ordered to adjust his defensive fires immediately, working from his afternoon concentrations. He adjusted concentrations V and VI (Map 3). A conference was held with the other forward observer, who wanted two concentrations at II and III. His judgment later proved to be excellent.

Upon checking with FDC we found that ammunition was not plentiful. When about 2300 the company on the right reported that an enemy company was starting to menace them again, we had to drive it off with a minimum of ammunition. 24 rounds were ordered for each of II and III, fired in 100-yard zones. The artillery quieted the Japs to the extent that no more than light irritation fire was received from the right during the remainder of the night.

About 0200 FDC called to say that we could fire all the interdiction and harassing fires we wanted. As we figured that someone was exaggerating, we elected to be sparing with our requests but decided to fire more frequently on the hill position at I. A convoy had come in with ammunition, although it was still on the beach. As it developed, all the observers had lots of business later and we pretty well shot the battalion out of ammunition by the time they were resupplied.

Around 0500 our position came under heavy enemy artillery and mortar fire. Both the left observer and the liaison officer called for previously adjusted fires at I, IV, V, and VI, and also attempted to adjust the fire in deeper areas. We knocked out a 70-mm battalion gun but did not succeed in stopping all the mortar fire before the enemy completed his preparatiton. About 0545 the left company reported they were being assaulted by enemy infantry. As they were obscured from our observation, it was necessary to move into the lines and consult the troops before shooting. They pointed out a group of coconut trees as the area of greatest concentration. In the

hazy twilight a time adjustment was commenced, to bring fire on the area at VII. Fortunately the sensings were accurate and fire came in on the target quickly, "Battalion 5 volleys, 1-c apart" being fired for effect. The bursts sparkling in the twilight made a particularly gratifying display at that grim moment. The company, which had killed 7 Japs in their position and 30 more out in front, reported that the attack was utterly shattered. This was further evidence that Japs will not go through a hail of artillery fire to reach an objective, and a demonstration of the relatively greater effect of time fire.

No sooner did we relax from that problem than the full scope of the enemy attack became apparent. A great many Japs started chattering in the woods to our left rear. Jap battle yells are a great help to artillery observers. The troops in the position around the CP all trained their ears and we finally decided where the enemy were. Once again we sent "fire mission" and made a time adjustment, firing a total of eight battalion volleys which covered about 300 × 300 yards. The Jap attack was broken; remnants kept straggling out of the woods headed west for two days thereafter. The time was then 0630.

During all this period the response from our battalion was magnificent, evidencing a clear understanding of the seriousness of our situation. Out of a whole enemy battalion that attempted to attack us, only 37 approached to within 100 yards and none of these departed.

About an hour later the infantry battalion received the order to attack at 1030, after a 20-minute preparation by three artillery battalions. At this point we were somewhat shaken by our experiences and even wondered if we could advance at all without assistance. We would have liked to spend the day banging away with artillery and making a terrain study. The airplane was sent up to help us, however, and we started adjusting the preparation fires. One light battalion was adjusted on the houses at 4 (Map 4), where the enemy had caused trouble to the troops that crossed the river the previous day and through which the right assault company had to advance quickly in order to attack the hill position at 3, if possible without suffering from enemy fire while crossing the flat terrain. By this time we were convinced there were Japs under every shack on the island.

The obvious objective for the attack was the hill mass to the right front at 3 (Map 4), mentioned above. The two small hills were expected to cause trouble to the right company, which would pass them after traversing the area to be neutralized by the light reinforcing artillery. The infantry commander wanted to put the fire of the medium battalion on the big hill in order to make sure that the enemy on the objective would be neutralized. With a medium battalion the coverage would include part of the smaller hills.

The heavy weapons company commander was of the opinion that with 250 rounds of captured Jap mortar ammunition, fire from our 81-mm mortars and heavy machine guns could keep the Japs on the low hills at 1 and 2 out of action until the commanding hill was secure. Events proved him right to a large extent, but it is probable that about 50 rounds of 155-mm time shell might have destroyed the Jap defense altogether. That might have been done before the infantry began to move; there was sufficient time, since we put down the preparation on the objective while the troops were traversing open ground under the cover of infantry weapons.

Plans of attack called for crossing the river about 200 yards below the bridge where our troops had crossed the previous day near a makeshift Jap bridge. The far bank offered some protection for the infantry after the assault, in case the crossing



Map 4—Crossing of Tagbong River; First Assault of Hill Position

was heavily contested. We decided to adjust the direct support battalion in a manner to neutralize any resistance near the river bank. One target was adjusted in the area of one of the morning attacks, the plan being to deliver light neutralizing fire in case any remnants were still effective in that area. Two other fires were placed directly in front of the troops at 5 and 6. By the time the adjustments were complete it was almost time for the attack to commence. A schedule was set for the preparation. About ten minutes before it started the attack was called off, evidently to allow time for ammunition to be delivered to the battalion. Presently we received the order to carry out the attack at noon. We contacted the artillery again and asked that our fire again be set up for attack.

After a time we were advised that we could only have six batteries firing 240 rounds. We were not sure that would be enough, but had to make the best of it. The most serious problem was the fact that there would be only one medium battery on the main objective. The preparation to the left flank was dropped and the direct support battalion set up to fire the two concentrations in front of the troops.

The infantry battalion had been reinforced with one company of reduced strength. The plan was to attack in two columns, with the rear protecting the flanks. It was planned to have the liaison party remain behind at a rear OP to adjust any fires that might be needed while the observers were on the move. It has never been possible to anticipate every angle of any enemy position in advance, and consequently there is a definite need for a stationary observer during the critical period of an assault.

When the attack started the right company managed quite well, but the left one came under a hail of automatic weapons fire. It became clear that more artillery fire was needed to neutralize a position we had not previously diagnosed as a threat. To provide this a fire mission was called for immediately. The battalion was hesitant to spend more ammunition, but the sheer urgency compelled them. The combination of this fire and the quick thinking of the commander of the company covering the left flank, who disposed his machine guns to

help neutralize the enemy, enabled the left front company to continue the advance after a relatively short delay and without serious casualties.

Meanwhile the company on the right had made remarkable and spectacular progress. The mission of the reinforcing light battalion cleared the way for them, while the support of infantry weapons covered them the rest of the way to the hill upon which medium artillery fire was falling. What we did not yet know was that the key to the enemy defense of this hill was a group of mortar positions in ravines about 400 yards behind the hill. When the company reached the top they came under severe mortar fire. The forward observer immediately called for more artillery; he succeeded in neutralizing the enemy to a large extent, but he was not able to prevent some casualties to our troops.

By this time the left leading company reported that they were secure in their position about 300 yards from the river and would be able to advance. The fact that the two leading companies had enjoyed so much success led to excessive optimism, so that when reports reached higher headquarters they must have gotten the impression that enemy resistance had ceased. Accordingly the order to advance to the Pagsangahan River was sent down. Between the time of the apparent victory and our receipt of the order, it had become apparent that we were in an extremely dangerous and difficult position.

In attempting to close the gap which had developed between the two leading companies (see Map 4), "A" Co (coming up from the right) ran into strong enemy resistance which had popped up again at hills 1 and 2, where the Japs had evidently recovered from the heavy mortar fire. At the same time the two right companies were ordered to advance, moving over the hill position to try to implement the order the battalion had received. The two companies on the left were ordered to move off down the road while the other two companies mopped up. The former no sooner started to move than they came under withering enemy fire. The extreme left company thought the fire was coming from the left, as they saw a few enemy troops about 400 yards away. The latter were apparently men straggling back from the smashed morning counterattack on our left rear. The observer with the left middle company could see that the fire was coming from the back side of hills 1 and 2. The enemy position was in a pocket between our troops, however, so it was not possible for him to fire with existing dispositions.

At the time the new orders were issued a misunderstanding developed that caused the company on the hill 3 to come down the near side of the hill without mopping up. This had serious consequences, as we were now in an untenable position and were fearful that the enemy might launch a counterattack. The decision was made to fight our way over the near hill with the aid of tanks and an artillery concentration so that we might safely set up a night position. As other sectors of the battle were active it took a little time to arrange for artillery before the fight started. Fortunately we already had a concentration adjusted in pretty close to the target, as the smoke screen obscured the bursts and the tank fire and other uproar made an adjustment at least tricky. The enemy on hill 1 was overrun and beaten down by the combined arms, after which the troops drew back into the bridgehead they planned to hold for the night—for to remain on the hill the troops would have had to spend the night within bayonet range of the enemy.

In the midst of all this commotion our regimental liaison officer called to say we would have first priority on adjustment

of defensive barrages. After a few minutes the observer on the left managed to get started, but we had to report that the other observer would be the last man ready since he had to wait for the lines of his troops to straighten out.

About 1700 a relief for the observer on the left managed to get through. He was shown in the maximum possible detail the defensive fires which the forward observer had been directed to place. At about the same time the liaison section was set up in the CP which was then being organized. No sooner was this done than, with the sun about to set, the troops on the right requested artillery to stop enemy small arms fire which was making the preparation of their position impossible. We called upon the left observer, who could observe satisfactorily and who had had more time to establish his night OP than the other observer who was himself under fire. As in this instance, it often proved feasible for an officer who was not under fire to observe for another man who could not observe without undue hazard, or in the event that an observer was on the move and a target popped up demanding immediate attention. In this particular case the observer did come under considerable rifle fire when he began adjusting, but he carried on and neutralized the enemy.

Later it proved that neutralization was not enough, but our troops were all entrenched by the time the Japs caused any more trouble. The right observer managed to establish himself soon afterward and the Japs kept down while he was adjusting defensive fires. He had memorized his lines well and was able to shoot effectively during twilight. The Japs somehow seem to be able to sense when the last round of artillery has fallen, as they started peppering away in the dark with rifles from the hillside when the artillery stopped. The observer who had just finished firing opened up again and finally silenced the Japs for the night, but to make sure we kept up a little harassing fire. During this particular night harassing fires paid off, as we discovered the following day that one volley killed eight Japs.

About 2000 the battalion commander received the order to take the hill by 0900 in the morning so that another regiment could pass through and begin the advance to Palompon on the west coast. At the moment this seemed like a big order, even though by that time all Jap resistance had been forced into the hill. What we did not fully appreciate was that we had already annihilated at least one Jap battalion, including troops who had been routed from the battlefield and hence were no longer effectively opposing us. As we review the events of the battle it seems fairly certain that a considerable number of Japs actually deserted under fire. The troops which opposed us were very well equipped and in excellent physical condition, but it was evident that they had never before fought against a modern army when their opponents held the initiative. Nevertheless, recapitulation showed that during three days of battle we had killed about 600 Japs up to the night under discussion. This includes the work of all arms.

The liaison officer called FDC to ask for 300 rounds for the attack. This did not seem like an extraordinary amount, but heavy action on all fronts had overtaxed our long supply lines. Our story sounded pretty grim, though, so they allowed us 200 rounds for the job. After considerable discussion among officers at the front and with the artillery S-3, we decided to fire a series of concentrations on a 300-yard front moving to a depth of 400 yards. We were fortunate in that the GT line was the same as the line of advance. The ammunition was set. FDC knew that the forward observer would be ready at 0630

and that the preparation would begin about 0745.

Promptly at 0630 communication was established with FDC, who knew what we wanted, and we had completed our adjustment about fifteen minutes later. Earlier we had decided to fire 3 volleys each at the short limit and at 50, 100, 200, 300, and 400 yards over. Remembering the previous day, it seemed wise to ask FDC how much ammunition we would have to hold the objective once we had taken it. When they replied "Very little!" we reluctantly decided to cut the preparation to 12 volleys at 5 ranges. It was agreed that the liaison officer would give all the commands to fire. This would free the observers to move, and we did not want a prearranged schedule.

The battalion commander then held his final meeting, at which we told the company commanders that they could move right behind the preparation as we would keep it far enough ahead so they would not be endangered. We were firing time fuze at extreme ranges so, although we had not had any short rounds, it seemed best to give the artillery a good margin of safety.

Firing commenced at 0750 when the first range was fired, followed by the second as soon as the troops started moving, and then about two minutes later by the third range. Delays of about four minutes preceded the fourth and fifth ranges, so the latter was falling on the reverse slope just as the troops moved up to the main objective.

Ten minutes later the battalion OP group were standing on the objective. Behind us lay over 150 dead Japs, while not a single American had so much as scratched his finger. The infantry reported finding the enemy still shaking in their holes during the assault, and they were able to dispatch them with ease. The coordination of all weapons in this attack was so effective that there was not a place where a Jap could move without being hit.

This battle was the writer's first experience with large scale open warfare against an equal force of Japs on what may be called "typical" terrain. From our experience in the engagement related, we are convinced that in open warfare an American infantry battalion or larger unit fully supported by American weapons can completely destroy an equal enemy force with less than 10% casualties.

It was found that we seldom had the time for staff planning which we had been trained to expect. In order for an infantry battalion to fight skillfully and keep up its momentum, it is essential that the artillery liaison officer be incorporated as an integral part of the staff. The Inf Bn S-3 and the LnO should be continually at the OP and should be consulted on the run. They and the weapons company commander and the commanders of other attached supporting units should act as a team, with intelligence and operational information being made available to them as fast as possible from all sources, including artillery observers who are very useful informants.

This team I have described should, as a fixed policy, take it upon themselves to issue warning orders to their units in accordance with the tentative plans of the S-3. In the case of artillery this is especially important, since the reinforcing artillery battalions needed may take an hour to arrange for if the division front is very active. As a general rule, it takes half an hour to make all arrangements. The reason for this is that decisions must be made on amounts of ammunition, and whether direct support battalions can be diverted for a short period of time. In practice it has been found that the medium battalion can be called on fastest, as it is usually in general support.

A delay which frequently dogged us was the range limitation of our radios at times when we ran away from our wire. Working through relay stations does enable us to maintain communication but it takes about three times as long as direct communication since it is necessary to check each message with great care. This does not mean, though, that we cannot usually receive rapid response from our own battalion on a hurry-up or urgent mission, as it can always give an observer at least one battery in emergency.

Since the infantry commander is usually preoccupied with his own tactics it is essential that the artillery observers continually appeal for opportunities to shoot. Artillery officers should urge upon infantry officers, from regimental commanders on down, that they hold and straighten lines while artillery fire is delivered on any area which is believed to have considerable defensive strength. Infantry officers are usually reluctant to lose their momentum, but at times when they lost it we have been able to provide them with a clear field for advance of as much as half a mile. The ten or fifteen minutes they wait for neutralization fire may later save as much as half a day, frequently making the difference between attaining or failing to reach an objective. When the enemy is directly assaulted by infantry he usually is able to get set with plenty of warning. On the other hand, a skillful artillery observer may be able to knock him off his perch before he knows what is coming.

On many occasions the cub plane can do some of this neutralization firing, but it generally takes time to acquaint him with the tactical details. Furthermore, the first sight of the cub will send Japs scurrying to their holes unless they have been driven into retreat by ground troops, in which case it mops up rather than paves the way. Therefore it devolves back upon the ground observer to place the close-in preparation fires during the advance.

From the experience we had it seems that an infantry battalion in the assault can readily use four artillery observers on the ground to do the job most effectively. In practice the forward observer is limited to a target area seldom more than 400 × 400 yards. Since targets of opportunity at times menace the entire battalion it is often necessary for the liaison officer to fire these missions, especially at times when FOs are pinned down by these very targets. A firing battery commander with complete freedom of action, in addition to the 2 observers, could be of great service in almost any action to take over the firing of these battalion missions, thus releasing the LnO for staff work. Prior to the new T/O now going into effect with us the BCs have had to spend a great deal of time as forward observers, as the regular observers became casualties from enemy action or from illness, or were so fatigued that their efficiency deteriorated. With additional officers the BC should be available as needed.

One other point worth mentioning is that the artillery officers in the front lines, by virtue of their close association with the infantry, are probably in the best position to tell the artillery CPs supporting them what is needed in a given situation. They should request exactly what they think they need, especially reinforcing fires. For instance, forward observers can usually keep a direct support battalion going full time. At times when artillery officers believe that there are worth-while targets beyond their observation they should ask for an air observer from a general support battalion to take over these missions, thus freeing their own airplanes for close cooperation on targets near the front lines.

# Field Expedients in Radio Communications in Italy

By Capt. Frederick C. Spann, FA, and T/4 Stephen Barabas, FA

Due to the very mountainous nature of the Italian terrain it is extremely important to place SCR-608 and -610 radio sets as near the highest point in the general vicinity of the battalion CP as is practicable, considering always the availability to the FDC and the protection offered the operating personnel. There is a continual need for an economy in the use of radio personnel brought about by the extensive use of radio relay liaison duty, and casualties. During our combat here in Italy we have constructed several very useful aids which greatly enhanced the efficiency of our battalion radio communications.

In order to meet these demands we found that by using three 35-foot twisted lengths of W-130 assault wire in cabled form, it was necessary to utilize only one radio operator to operate the SCR-608 in the Division Artillery Net. Construction of such a cable is simple. Remove the plugs from the short transmitter and receiver leads of the Remote Control RM-29 and extend these two

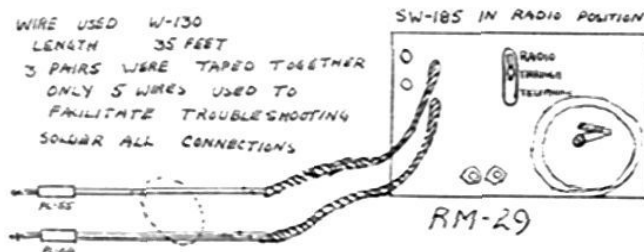


Figure 1. Remote Control Extension Cable Operating SCR-628, -609, -610.

leads with the homemade assault wire cable, replacing the plugs at its end. Splice two leads of a twisted pair to the receiver lead and three of the four remaining leads to corresponding connections on the transmitter lead. Fig. 1 is a diagram of the required hook-up. The SW-185 switch is left in the radio position at all times.

In order to place the SCR-610 (base set) in its most advantageous position and at the same time conserve batteries in all radio relay and liaison sets, we have very successfully used a vibrator pack mounted in a ¼-ton C&R vehicle (which is easily dug in and sandbagged) in conjunction with a 30-foot cable between the vibrator pack and the transmitter and receiver, constructed from two cabled lengths of CC-345 signal cable. The CC 345-cable, made of a tin-copper alloy, has an extremely low resistance which makes it an ideal conductor for this use. Similar lengths of German signal cable are an excellent substitute. Caution must be used in soldering the 4 black and 4 white leads to the terminals of the male and female couplings. A good solution is to solder the black or the white leads to the A, B, C, and D terminals, and the remaining four leads to the E, F, G, and H terminals. This will aid in trouble shooting.

Initially wet weather caused corrosion and arcing between the pins of the male and female plugs due to water seepage, creating a voltage drop of as much as 30 volts. This was especially true at the soldered connection cable-to-plug. Taping the connection did not help. This trouble we overcame, however, by using pitch prepared from the tops of used BA-27 batteries and poured into the male coupling in sufficient quantity to seal the base. These tops, incidentally, were melted on a one-burner gas stove in a "C" ration can. Results were excellent.

Occasionally a shortage of BA-40 batteries is encountered due to the difficulty of supply during rapid movement or extreme weather conditions. This problem we solved by making an adapter for a BA-43, using the socket of a BA-40 battery as a female joint and the base of a VT-221 (or similar radio tube) as a male joint. Close attention is required to the fact that both positive terminals of the BA-40 are located on the same side of the connector and that the BA-43 has its positive and negative terminals on the same side. This necessitates a reversal of the A supply, as is indicated in Fig. 2. A point of interest is that the BA-

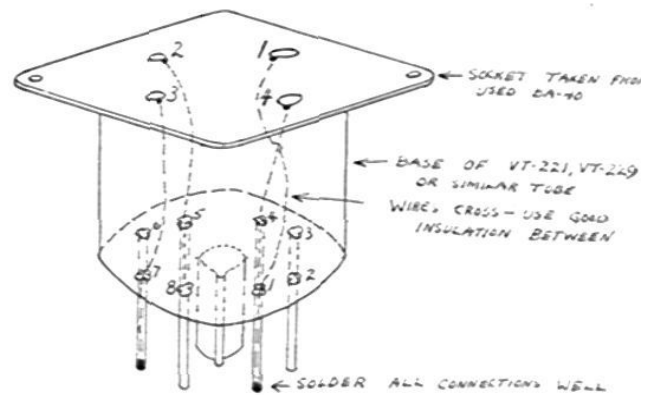


Figure 2. Adapter Plug Used on BA-43 In SCR-609 When BA-40 Is Not Available.

43 gives longer life under the same operating conditions than the BA-40 when used as a substitute in the SCR-610 radio.

Another field expedient has been necessary in the repair of SCR-610 speaker cones, which undoubtedly crack due to the concussion created by mortar and shellfire. We found that by applying to the crack the rice paper sheets from the Signal Corps Message Book with a good grade rubber cement (which can be obtained from the motor section), we had a workable solution. Perhaps a shield similar to the type found on the SCR-284 speaker would reflect the major portion of the pressure caused by the concussion wave and thus eliminate the cone's cracking.

## SHED THE EXCESS!

"Tell the boys who follow me to throw away that d—footlocker. A G.I. dufflebag and a val-pack will carry all you need. Bring lots of stationery, though—it's hard to get."

—Extract from letter from a lieutenant "down under."

# COUNTERMORTAR OPERATIONS

By Maj. Arthur J. Peterson, FA

## AUTHOR'S NOTE

Lt. Col. Gildart's article "Countermortar" in the December *Field Artillery Journal* aroused considerable interest in the writer's unit. It was very timely.

A system for dealing with enemy mortars was initiated in the 34th Div while on the Anzio beachhead in May 1944. The principles put into practice there were extremely effective and have since become SOP in the division. They differ in some minor respects from the principles set forth by Col. Gildart. The SOP was set down in printed form as a divisional "Manual for Countermortar Operations." Full advantage was taken of material from all sources.

An account of our experiences with countermortar operations will serve to explain the reasons for our present methods.

The increased use of mortars by the enemy is influenced by several factors which assert themselves whenever the tactical situation becomes slow-moving or static. First, as a result of efficient counterbattery work the activity of enemy artillery is restricted, thus necessitating the allotment of many artillery tasks to infantry mortars. Secondly, enemy mortars take advantage of delay in the tactical situation to dig in and perfect coordination of fires. A desire to conserve artillery ammunition for targets considered more vital may also cause an increase in enemy mortar fire. In any case, forward areas suffer an increase in enemy mortar fire any time the tactical situation slows down.

The first time this problem presented itself to the 34th Div was at Cassino during January and February, 1944. No effort was made at that time to organize countermortar operations. Normal target-getting agencies were depended upon to locate enemy mortars but a separate record of enemy mortar locations was kept at DivArty and organized shoots on enemy mortars were arranged when mortaring from certain sectors became heavy. Because of other pressing problems no more attention was paid to enemy mortars than to other enemy infantry targets.

After the 34th Div had spent a short time on the Anzio beachhead it became apparent that enemy mortars would require more attention than they had been previously given. It was decided to set up some form of specialized operation to deal with them. There were two problems confronting us—who would conduct the countermortar operations and how were they to be conducted?

After some deliberation it was decided that the Infantry Regimental Headquarters would primarily be responsible for countermortar operations for the following reasons. Countermortar operations fall into two phases: (1) the location of enemy mortars, (2) their neutralization. The man who has the most knowledge (or who has the best facilities for getting it) of enemy mortar locations is the Infantry Regimental S-2. He also has direct call on enough

weapons (Cannon Company and Heavy Mortars) to be able to tackle most enemy mortar problems that arise. Because of the limited range of enemy mortars he is also the person most affected by their activities and is likely to react more promptly. Finally, he has a relatively small sector to watch and can give it his undivided attention. This includes keeping his observers on the ball as far as enemy mortaring is concerned. The Division Countermortar Officer (normally the DivArty S-2 or his assistant) was assigned the task of coordinating the countermortar efforts of the division as a whole and arranging for additional fire support when enemy mortaring was too heavy for the infantry weapons to handle.

The solution to the problem of *how* to conduct countermortar was relatively simple. All that was necessary to do was to model it as nearly as possible after the existing counterbattery setup. Regimental S-2s visited the DivArty FDC and took a short course in counterbattery operations, and with the assistance of officers from direct support artillery battalions set up along similar lines.

It was found that the heart and soul of countermortar operations were Mortreps. The countermortar officer must continually hammer their importance into all personnel. The tendency to report only those rounds landing in the immediate vicinity must be overcome. If the CMO takes especial pains to react promptly to the first Mortreps he receives it will inspire confidence in his system and pay dividends in the long pull, even though he may waste a few rounds of ammunition. The CMO should also take time out to let observers know what he is doing for them. Even if he does not stop the mortaring at once they will know he is making an effort.

Although considerable space in our manual is devoted to determining direction from mortar bomb craters, this has not been found to be a profitable source of information. The process amounts to something like, "Who is going to bell the cat?" As areas subject to enemy mortaring are too often under enemy observation, any attempts to operate there is almost certain to invite additional mortaring.

Air OPs in themselves are efficient countermortar weapons because of the tendency of enemy mortars to remain inactive in their presence. Enemy mortars were active during the periods of darkness and during weather when Air OPs could not operate. As air observers experienced extreme difficulty in locating active mortars, they were never dispatched for the sole purpose of locating enemy mortars.

After the breakout from the Anzio beachhead the countermortar system broke down and its usefulness ceased. This was due to two reasons: Countermortar imposes a heavy load on communications, and as communications are rarely more than sufficient for normal operations in a moving situation other types of messages took precedence thus delaying enemy mortar information until it was of little value. Enemy mortars were kept on the move so much that it was almost impossible to keep them located.

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You'll have less trouble from unexpected places on mechanical equipment if you take the trouble to inspect and service those parts which may be expected to give trouble due to their exposure to dirt and moisture, the amount of strain they must bear or the delicacy of their construction made necessary by their functions. One thing always leads to another. Prevent failure of the weak spots and the strong spots will take care of themselves.



# NORTH LUZON

By Col. Conrad H. Lanza

That part of Luzon which lies to the north and east of Lingayen Gulf constitutes just over one half of the entire area of that island, having about 21,000 square miles out of a total of 40,814. Population density is only half that for the whole of Luzon; inhabitants total about 1,700,000, or nearly 23% of the 7,374,798 reported by the 1939 census as living in Luzon. Nevertheless, certain parts of north Luzon are densely populated and as densely cultivated as in any section. The low average density is due to the geographical conditions.

North Luzon is about 180 miles long from north to south, and has a maximum width of 135 miles and an average width of 114. Its dominant feature is the valley of the Cagayan River. Having its source in mountains to the south, this river, the second largest in Luzon, flows north 200 miles in a winding course to enter the sea through a wide delta near Aparri. The Cagayan valley averages 50 miles wide and is remarkably fertile. This is the largest watershed area within the Philippines.

On the east side of the Cagayan valley is the Sierra Madre, a range of mountains bordering the Pacific coast. They are so close to the ocean that not a single stream line of importance is to be found on their east side. The coast area is sparsely inhabited; it has no roads and but few trails. There is only one good trail over these mountains, leading to Baler Bay at the extreme south end of the sector. Altitude of the Sierra Madre averages over 3,000 feet, with peaks rising to 4,500 feet. This range profoundly modifies the rains and forms a first class military obstacle.

On the west side of the Cagayan valley is another and higher mountain range, the Central Gran Cordillera, which has peaks exceeding 9,000 feet. The range fronts on the China Sea, but unlike the Sierra Madre it approaches the sea at only a few points. In most places there is a coastal plain, from which fertile and populated valleys extend short distances inland. A coastal road runs along all of the west coast and continues along the north coast to Aparri. Several roads and good trails across the mountains lead into the Cagayan valley. It is practicable for invasion forces to land on the west coast and proceed either north or south, or eastward over the mountains. The west range of mountains inclines southeast at the south and joins the Sierra Madre, thereby enclosing the Cagayan valley with mountains on east, south, and west.

There are no established ports on the east coast, and to date no invasions have occurred in this area. On the north there is a port at Aparri, and on the west coast others at Vigan and San Fernando. These are small ports, which have not been ports of entry. They have been used by coastal ships, which for many years have carried a large volume of trade to and from Manila. All three ports were used for invasion landings in 1899 by Americans, against light opposition, and in 1941 by the Japanese without meeting resistance.

Mountain areas cover a substantial part of the country. They used to be lightly inhabited by pagan tribes. Since the American occupation roads have opened up this area, and it now has a much larger population. It is now almost self-supporting as to food supplies. The opportunities for guerrilla warfare have considerably improved. It would seem possible that an enemy might maintain himself in this section of Luzon for some time.

The Cagayan valley is sheltered from both the northeast and southwest monsoons by the mountain ranges to east and west.

During the season of the northeast monsoon (from December to May, both inclusive) light rains get over the Sierra Madre range. During the southwest monsoon (June through November) the monsoon rains are generally stopped by the higher Central Gran Cordillera. This season coincides with the typhoon season, however, and typhoons do get over the mountains. The north section of Luzon is crossed by 35% of all typhoons—the highest percentage within the Philippines. Consequently there is some rain nearly all the year 'round.

The west coast plain has the same climate as Manila and the Central Luzon Plain: a pronounced dry season during the northeast monsoon, which can not bring rain over the mountains, and a pronounced wet season during the southwest monsoon. The amount of monsoon rain increases as the elevation rises, there being substantially more in the mountains than on the coast.

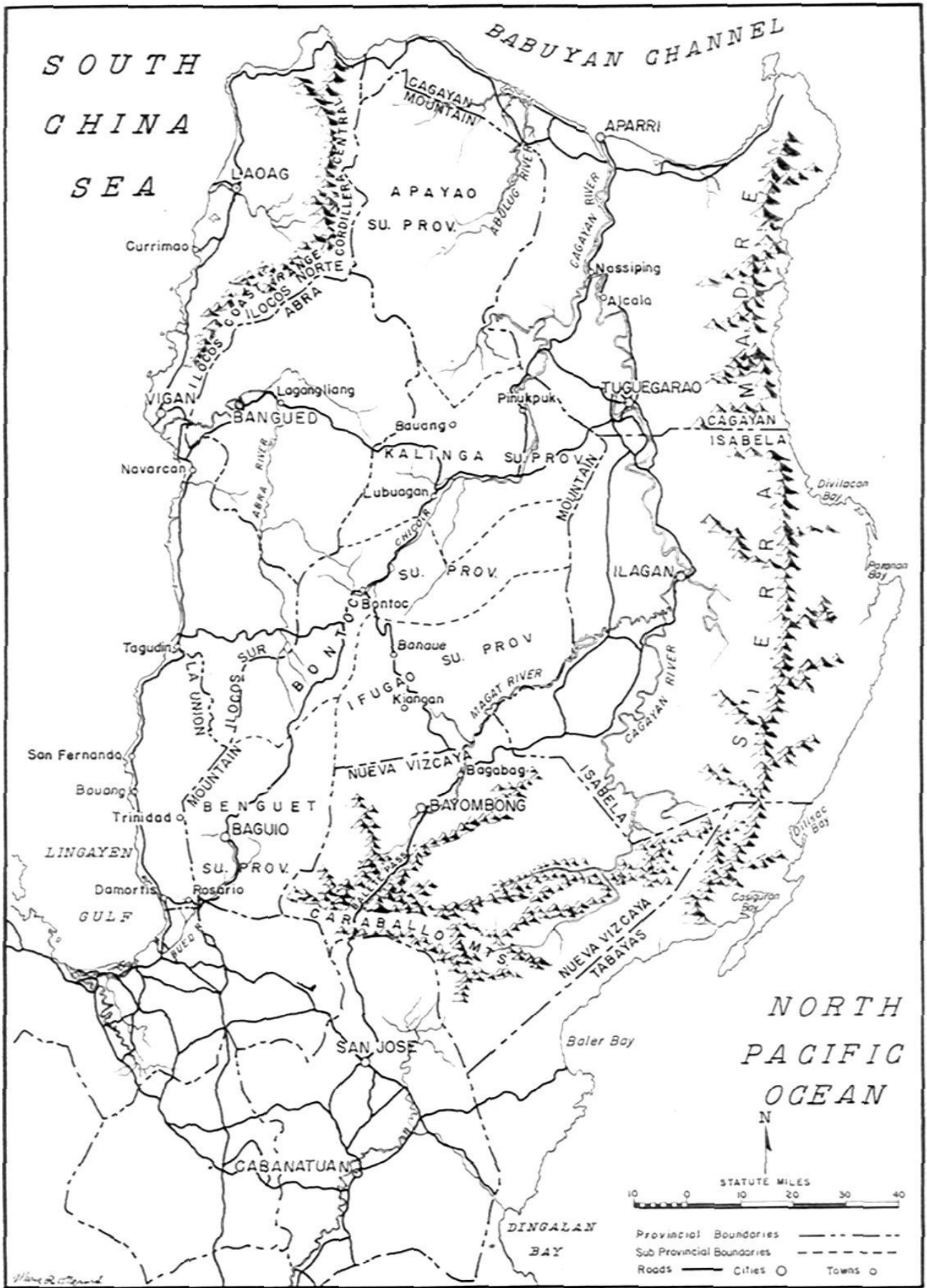
During the typhoon season the Cagayan River is subject to serious floods, which bring new soil from the mountains and distribute it over the low lands and are beneficial to agricultural interests. At such periods the river is an obstacle. The Cagayan is navigable for motor launches and similar small craft from the sea to Tuguegarao, 185 miles inland by water. Much of the freight is carried in flat-bottom boats known as *barangays*, which are poled in shallow water and use sails in deep water.

Invasion forces may reach the Cagayan valley by sea by landing at Aparri at the mouth of the Cagayan River or in that vicinity. Other approaches are from Vigan and San Fernando on the west coast, from which roads lead over the mountains. By land from the Central Luzon Plain there is an excellent road, Route No. 5, which starts from San Jose in Nueva Ecija and crosses the Central Gran Cordillera, where its south end turns southeast to join the Sierra Madre. Over this mountain range the road descends along the valley of the Magat River. This is a branch of the Cagayan, which it joins near Iligan. The road continues all the way to Aparri.

North Luzon is divided politically into provinces whose areas and populations are:

<i>Provinces</i>	<i>Square Miles</i>	<i>Population</i>
<b>West Coast:</b>		
<b>Ilocos Norte</b> .....	<b>1,022</b>	<b>271,532</b>
<b>Ilocos Sur</b> .....	<b>1,330</b>	<b>237,536</b>
<b>La Union</b> .....	<b>638</b>	<b>207,701</b>
<b>Abra</b> .....	<b>1,473</b>	<b>87,780</b>
<b>Cagayan Valley</b>		
<b>Mountain</b> .....	<b>5,669</b>	<b>296,874</b>
<b>Cagayan</b> .....	<b>3,007</b>	<b>292,270</b>
<b>Isabela</b> .....	<b>3,908</b>	<b>219,864</b>
<b>Nueva Vizcaya</b> .....	<b>3,530</b>	<b>78,505</b>
<b>Totals</b> .....	<b>20,577</b>	<b>1,692,062</b>

In addition there is a section of Tayabas Province along the east coast 75 miles long, extending north from Baler Bay, inclusive. The average width is 10 miles. Population is small, most of the area being uninhabited. There are no separate statistics for this minor sector. Allowing for this part of



SOUTH  
CHINA  
SEA

BABUYAN CHANNEL

LAOAG  
Currimao

CAGAYAN MOUNTAIN  
APAYAO SU. PROV.  
Abulo River

APARRI

NAVARRA

Nassiping  
Alcala

ILOCOS NORTE  
ILOCOS SUR

VIGAN

Lagangiang  
BANGUED

TUGUEGARAO

Bauang  
KALINGA SU. PROV.  
Lubuagan

CAGAYAN ISABELA

Navarcan

CHICOR  
SU. PROV.

PINUKPUK

Divisadero Bay

ILAGAN

Tagudin

Bontoc

Banau  
IFUGAO SU. PROV.  
Kiangnan

MAGAT RIVER

Paranan Bay

San Fernando

Bouang  
Trinidad  
BENGUET  
BAGUIO

Bagabag  
BAYOMBONG

ISABELA

Divisadero Bay

LINGAYEN

Damortis  
Rosario

CARABALLO

ISABELA

Divisadero Bay

GULF

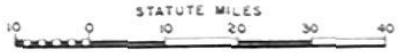
SAN JOSE

Baler Bay

NORTH  
PACIFIC  
OCEAN

CASANATUAN

DINGALAN  
BAY



Provincial Boundaries ————  
 Sub Provincial Boundaries - - - -  
 Roads ———— Cities ○ Towns ○

Wm. R. Stewart

Tayabas, the area of all of north Luzon will be close to 21,250 square miles and the population about 1,700,000.

#### ILOCOS NORTE

This province extends about 60 miles from north to south and is 25 miles wide. Its east boundary, separating it from Cagayan valley, is the main mountain chain of the Central Gran Cordillera, commonly referred to as the Cordillera Central. This rises right out of the sea at the northeast corner, reaching a height of 3,500 feet within 10 miles of the north end and increasing in altitude to over 6,000 feet at the south end of the province. The coast road, Route No. 3, goes around the edge of the mountains along the north coast. With this exception there are neither good trails nor roads over the mountains.

A separate mountain chain parallels the main range and is close to the China Sea. Called the Ilocos Coast Range, it consists of low foothills. There are numerous rivers, all short and rapid. During typhoons very heavy rains fall, and the water rushes along the rivers in very strong and swift currents. Military operations during the wet season are liable to be restricted by weather conditions.

Capital of the province is Laoag, on the river of the same name and about 5 miles from its mouth. The river is not navigable; in the dry season it may be forded in places. There is a large airfield near Laoag, population of which is 41,842. Currimaog, about 15 miles south of Laoag and with an excellent connecting road, is on an open bay. Here are considerable sand beaches; when the surf is not heavy landings can be made. The season of high surf is the southwest monsoon season.

Lining the coast is a highly cultivated plain bearing rice, cotton, sugar, and vegetables. The situation is similar along rivers extending inland, and between the two mountain ranges. The industrious natives belong to the Ilocano tribe. As there are not enough farms for the constantly increasing population, emigration was heavy. Many people went south to the Central Luzon Plain, some to the Visayas, others to the Cagayan valley. A large number of the Filipinos in California and Hawaii are from the Ilocos provinces.

Ilocos Norte is a main supply center for carabaos, which are exported. This farm animal is of great local value. It has some military value too, due to its ability to haul loads through mud where motor transportation would be stalled. An effort was made to adapt carabaos to artillery use. They were issued to a mountain battery and hauled guns and equipment at a speed of about 1½ miles an hour; exceptionally a 2-mile speed could be had for short distances. The animals had a habit of lying down in the road when they felt tired, and as they weighed about two tons each it was almost impossible to clear them away. The experiment was abandoned for tactical organizations. For transportation they have been in constant use.

Towns are normally a few miles back from the sea. Considerable land close to the shore is sandy and of inferior agricultural value, whereas inland it is excellent. The main coast road goes through the towns.

Back of Laoag is the valley of the river of the same name. The main part of the valley lies between the coast range and the main range.

There are no satisfactory roads or trails over the mountains from Ilocos Norte to Cagayan.

#### ILOCOS SUR

Just south of Ilocos Norte, this province resembles it in a general way. The coast plain does not exceed 6 miles in width

and at some places (for example, near Vigan) disappears entirely, the foothills coming right down to the coast. Sugar and tobacco are raised for export. Food has to be imported, as the province is not self-supporting. Customarily rice is brought from Ilocos Norte and corn from Abra.

Vigan (pop. 20,939) is the capital. There is a small port close by, and beaches where invasion troops could land. Near the town of Tagudin at the extreme south of the province an open bay is available in good weather.

Two roads lead eastward from Ilocos Sur, over the mountains to the Cagayan valley. The northern one starts from Navarcan (15 miles south of Vigan) and runs through Abra to Tuguegarao, in the center of the Cagayan valley. The south road starts from Tagudin and goes 50 miles east to Bontoc, whence a right fork goes southeast to the upper Cagayan valley and a left branch to Tuguegarao. The south road is the shortest route from the west coast to Bontoc, and is as good an invasion route as any.

#### LA UNION

La Union is south of Ilocos Sur and at the northeast end of Lingayen Gulf. It is very rugged. At both north and south ends the coastal plain practically ceases, as the foothills reach the shore.

The capital is San Fernando (pop. 23,366), which has a fair port available for medium ships in good weather. A spit of land affords shelter against the southwest monsoon. The Manila Railroad follows the coast road from the south as far as San Fernando, which is the north railhead.

Landings can be made at several points. Damortis (at the south end) and San Fernando are the best places. Both were the site of invasion landings in 1941 by Japanese, and had previously been in 1899 for Americans.

Two roads lead over the mountains from the coast. They start from Bauang (6 miles south of San Fernando) and at Damortis. Both unite at Baguio, some 25 miles away. Thence the road leads northeast to Bontoc, 60 miles away, which is the gateway from the west to the Cagayan valley. Either one of the roads from Ilocos Sur is 35 miles longer than the route to Bontoc from Tagudin, in Ilocos Sur.

\* \* \*

In all there are four good routes from the west coast over the mountains toward Cagayan. The two southerly ones join at Baguio, and their continuation joins at Bontoc with the north central route from Tagudin. The most northerly road from Navarcan is independent of the others. Then there is the shore road around the north end of the mountains.

An enemy holding Cagayan has only five roads on a 150-mile front to watch on the west. The intervening country is extremely rough, and while practicable for small parties, would not be so for large forces. The roads traverse terrain ideal for defense: wooded and precipitous mountains.

#### ABRA

East of the Ilocos provinces, this is an interior and mountain province. Its main geographical feature is the Abra River, which rises in the south outside of the province. As far as Lagangliang it flows north between the Cordillera Central on the east and the Ilocos Coast Range on the west. Here it turns west, breaks through a deep gorge, and enters the sea at Vigan. At times it carries a great quantity of water, but it is

navigable nowhere.

Nearly all towns are in the valley of the Abra. The capital is Bangued (pop. 15,287).

Abra province is traversed from west to east by the road from Navarcan to Tuguegarao in Cagayan. The road goes through Bangued.

The gorge through which the Abra River passes the Coast Range is of insufficient cross-section to carry off all of the water during certain periods of the typhoon season. It then backs up and overflows the valley lands. Rises are sudden and occasionally cause loss of life. The road into Abra does not pass through the gorge: it goes over the coast range south of the river. There are several bridges near the Abra near Bangued. If they were destroyed by the enemy the river would be an obstacle, as its current is swift at all times and very heavy and very swift during the typhoon season.

The inhabitants of Abra belong to the Ilocano tribe.

#### THE MOUNTAIN PROVINCE

This is the largest in Luzon. It is inhabited by several tribes speaking different languages and having different customs. It has been divided into five sub-provinces which roughly correspond to the occupying natives. In order from the south these are Benguet, Ifugao, Bontoc, Kalinga, and Apayao.

The Mountain Province is known for its gold mines, its cool climate due to the high altitude, and its temperate zone products. Copper and silver are found, and with gold have been mined for centuries. Until the Americans came this was on a small scale, however. Then gold mining took a spurt. The main mines are in Benguet.

The west side of the mountains receives a heavy rainfall during the typhoon season, but thereafter comes a dry period. In the dry season streams on this side are fordable and not an important obstacle so far as current is concerned, but they may be serious impediments to traffic due to high and precipitous banks.

On the east side of the mountains—the Cordillera Central—rain falls all the year and there is always water in the streams. This enables two crops per annum to be raised. Rice is cultivated on terraces which are one of the marvels of the world. Each terrace is a level combination cut-and-fill on the mountainside. The outer edge is revetted with a stone wall which prevents the fill's being washed away. An elaborate system of irrigation ditches conveys water to the terraces or leads off surplus rain water. No one knows who originated these really wonderful terraces, but the natives know how to maintain them and from time to time extend them. The retaining walls, 5 to 10 feet high, are not negotiable by tanks or motor vehicles. The rice terraces seldom have trees or bushes. It is easy to observe the opposite sides of ravines and canyons and difficult to conceal defenses among such terraced mountain slopes.

Where there are no terraces, forests are common. Due to the altitude they are often open. The pine tree is common; oaks occur, but mixed with the usual tropical trees. As grazing is possible between pines, large numbers of cattle are raised.

In the months when rain is not too heavy the grass within the forests becomes inflammable. Grass fires start and soon become forest fires. This is almost certain to happen from artillery fire, when firing occurs on hot days.

Nights in the mountains are always cool. There is no snow, but temperatures go to around 40° F. Fires are comfortable.

Troops need overcoats and warm clothing.

Besides rice and beef, sweet potatoes (a native variety which is a yam) are the main article of food. In general the natives raise sufficient food for their own use.

*Benguet* sub-province is well known to Americans, as it is the site of the Philippine summer capital of Baguio. There were also a military hospital, an army rest camp, and a summer home for the commanding general stationed at Manila. It was customary to establish an advance CP at Baguio from February to April.

Baguio can be reached by two first-class roads. The northern one, starting from Bauang on the coast, is known as the Naguilian Road. As it follows ridge lines, it can not easily be blocked by slides caused by bombing. A direct hit on the road where the ridge is narrow might stop traffic. The second road starts from Damortis on the coast and follows up the canyon of the Bued River. At Rosario, 5 miles from the coast, the main road from Manila joins. The Bued Road can be blocked by bomb-caused slides.

Three miles from Baguio is Trinidad, the local capital. A good road through this town goes on to Bontoc. Numerous good trails through the adjacent mountains are practicable for pack transportation. Baguio used to be an excepted post—not part of the Mountain Province or of Benguet sub-province. This was because it was the site of the civil government's summer capital.

The inhabitants of Benguet are Igorotes. In a fertile valley near and around Baguio and Trinidad the usual tropical products are grown, as well as many temperate zone products (such as strawberries, cabbages, beans, peas, etc.).

*Bontoc* sub-province is just north of Benguet. Its capital and principal town is also named Bontoc. This can be reached by the road from Baguio. A more direct route from the west coast is the road extending east from Tagudin, in Ilocos Sur.

Bontoc town (pop. 14,284) is also the capital of the Mountain Province. It is in the canyon of the Chico River, surrounded by high mountains. Except when typhoons pass by rain is scarce. There is not enough water to raise crops for the local needs, nor enough farming to afford work for all.

The inhabitants are Bontocs. To secure a living many must work outside. A source for labor gangs, they have done well in road building.

From Bontoc a good road leads southeastwardly to Kiangan, the capital of *Ifugao*. This sub-province has some of the most remarkable of all of the rice terraces. Most extensive ones are near Banaue, intermediate between Bontoc and Kiangan. The road continues on beyond this town (which is the local capital) to Bagabag, Nueva Vizcaya (in the Cagayan valley). The road is a major invasion route which can be used in either direction.

The Ifugaos are a pagan race. Until recently they were hostile to all strangers.

*Kalinga* sub-province is just north of Bontoc. The road from Bontoc traverses Kalinga from southwest to northeast, passing through Lubuagan (the capital) to Pinukpuk (at the northeast corner). At this town it is joined by the northern trans-mountain road from the west coast, which starts from near Navarcan and passes through Bangued, Abra.

The inhabitants of Kalinga belong to various small tribes and have different languages. Some of them are descendants of the Sulus. They were transported by the Spaniards from the Sulu Islands, where they had been adjudged to be undesirable citizens, and exiled to Kalinga. In the local language Kalinga means *stranger*.

After passing through Pinukpuk the road inclines eastward

and goes on to the Cagayan valley, being a major possible invasion route and the only good one overland from the west, north of Kiangan.

*Apayao* is the northern sub-province and the most isolated of all. The inhabitants belong to special small tribes who dress differently, have their own languages, and do not irrigate their fields.

There are two routes of entry. One is a trail north from Kalinga, the other a trail southward along the Abulug River from the north coast. The Abulug River is not connected with the Cagayan River, but its valley adjoins it and is considered to be part of the Cagayan valley.

Excluding the Abulug valley, the remainder of Apuyao and near all of Kalinga are rough and rugged mountain areas with large forests which afford opportunities for guerrilla warfare.

#### CAGAYAN

This province forms the northeast corner of Luzon. The Cagayan River flows close to the west boundary. At its mouth is the port of Aparri. At the south end of the province, on the river, is the provincial capital of Tuguegarao (pop. 27,643).

A good road follows all the way up the Cagayan valley. It is joined at Alcala by the trans-mountain road from the west coast coming from Bontoc or Navarcan. The east part of this province is the Sierra Madre, which closely borders the Pacific Ocean. Until recently there were no roads and no established trails over the Sierra Madre. It is said that the Japanese have opened trails to the east coast over the mountains to facilitate delivery of supplies received by barges and by submarines from Japan.

Cagayan is a major tobacco country, the best of Filipino tobacco being grown here. No tobacco is raised in the area about the delta of the Cagayan River. Rice is raised everywhere, and corn in most places. The flanks of the valley are grassy plains suitable for grazing cattle. Coconuts are common on the coast but not elsewhere.

The Cagayan delta is a nipa swamp. It would be practicable to land at various places on either side of the delta. The coast road goes from Aparri westward to Ilocos Norte. There are numerous defiles along this road, some caused by the mountains around the north end of which the road passes and others by swamps. An invasion force having control of the sea can by-pass a defile by landing in rear of it. There is no good road east of Aparri.

Aparri is a port which has been open to the coastal trade. It lies on the east side of the Cagayan River. There are good beaches adjacent to the town. It is the nearest Philippine port to Formosa and Japan.

There are no major military obstacles to an invasion of Cagayan by landings at or near Aparri. The province can also be invaded from the south along the valley, or from the west over the mountain road. There is no route available from the east.

A central position in readiness is near the junction of the Cagayan River with its branch, the Chico River. Along the latter comes the mountain road from Bontoc. Near the river junction are the towns of Nasiping and Alcala. A force in this location can move in any of three directions: north, west, or south. Conversely, if seized from the enemy it would sever all important lines of communication within the province.

The Cagayan valley is well cultivated, with ample flat land. Extensive airfields are near Aparri and Tuguegarao. Others could be readily built in numerous other places.

#### ISABELA

Isabela is the chief tobacco production area of the Philippines. It lies between Cagayan on the north and Nueva Vizcaya on the south. It is traversed from south to north by the Cagayan River, and by the main valley road extending to Aparri on the north from Manila to the south.

Capital and principal city is Iligan (pop. 31,323), which is nearly at the center of the province and on both the Cagayan River and the valley road.

The Cagayan valley is low and well cultivated. On each side are grassy plains. The Sierra Madre separates these on the east from the Pacific Ocean. On the west is the Mountain Province. No important roads are noted except the axial valley road, available for north-south traffic.

On the east coast are two small bays suitable for barges and small craft — Divilacan Bay (north) and Paranan Bay (south). Although there have been no roads to these locations, it is quite possible that the Japanese have established trails to them from the Cagayan valley.

#### NUEVA VIZCAYA

This is the southeast province of north Luzon. It does not reach the Pacific coast, as the shore side of the Sierra Madre is here assigned to Tayabas Province. There are four bays on this section of coast suitable for barge or submarine traffic. In the north is Dilasac Bay, in the center Casiouran Bay. Each of these has a small settlement of natives, but there have been no overland routes to them. In the south are Baler and Dingalan Bays, close together. Baler is a very old military post, dating from Spanish times. There is a road across the mountains to this bay, but with very steep grades and not suitable for heavy traffic. On the east side of the mountains this one road joins the road net of the Central Luzon Plain at Cabanatuan.

While Baler is the best harbor on the east coast it is far south for an enemy based in the Cagayan valley. Any or all of the bays further north, contingent on having arranged mountain crossings, are preferable.

Nueva Vizcaya is at the head of the Cagayan valley. Along its south boundary are the Caraballo Mountains, which extend from the Cordillera Central on the west to the Sierra Madre on the right. This cross-chain has an elevation of some 4,000 feet. The main road from Manila to Aparri goes by long zigzags through this chain at Balete Pass.

After leaving the pass the road follows along the Magat River, on whose banks are the majority of towns of the province, including Bayombong, the capital (pop. 12,146). The Magat is nearly parallel to the Cagayan and about 25 to 30 miles west. This river after passing the north boundary of Nueva Vizcaya turns east and flows into the Cagayan. Within Nueva Vizcaya the two rivers are separated by mountainous terrain without cross-roads.

Directly west of Bayombong the Cordillera Central rises to elevations exceeding 9,000 feet with neither roads nor trails over them. Mountains are heavily wooded. The only practicable entrances to Nueva Vizcaya, for other than small detachments, are by the road south to Manila or north to Aparri.

Inhabitants are mainly of the Cagayanes tribe, but there are a considerable number of Igorots and Ilocanos. The Magat valley, well cultivated, normally raises a small excess of food supplies. Besides rice, sugar, tobacco, coffee, cacao, and fruits are principal crops.

## COMMENTS

1. The north half of Luzon offers good facilities for maintaining minor warfare, or guerrilla warfare, by organized troops. As long as the fertile valleys are held, the occupying forces can secure locally the necessary food supplies. Especially, this food is sufficient for a Japanese. Unless the force is very large clothing can also be procured. The natives weave their own cloths and dye them by their own means. Each province and sub-province has a slightly different kind of cloth and color to individualize its own people. Hats suitable for tropical wear are available.

2. Main diseases disabling from a military point of view are malaria and dysentery. Malaria can be controlled by proper drugs, and dysentery by attention to purifying water supplies. The Japanese could probably fly in what quinine they need to ward off malaria. The purification of water depends principally upon boiling, which is not always practicable during an arduous campaign in the tropics, where water for drinking is demanded frequently and in quantities.

3. To conquer north Luzon control of the valleys to cut off food supplies, and access to air fields, are of prime importance. The mountains are not entirely devoid of food—note the wonderful mountain rice terraces. Potatoes (sweet), fruits, corn, and cattle are to be found. It is to be presumed that the Japanese have had the foresight to cache supplies within the mountains.

4. Military supplies required by the Japanese, other than what have already been stocked, must be either flown in or brought in by boats. Notwithstanding the Allied air and sea blockade, experience has shown that this is not absolutely tight. Some enemy supplies manage to get by.

5. Japanese forces in north Luzon are cut off from possible road communications with forces in the south as long as the Allies hold the Central Luzon Plain. There are no north-south roads east of this plain.

Small parties might go overland along the Pacific coast. This is a nearly deserted region, where north-south communication is habitually by the sea. There is a lack of food in the Sierra Madre which in previous campaigns has handicapped troop movements therein. It might be possible to maintain patrol communication along the east coast, but no important body of troops could move unless sea passage was available.

6. The control of the Central Luzon Plain ensures a separation of enemy forces in north Luzon from those in south Luzon, less patrols and occasional air and sea connections.

7. The Cordillera Central on the west side of the Cagayan valley has a considerable number of mountain trails. Local pack transportation is available. More people live in these mountains than in the Sierra Madre, to the east of the Cagayan. These conditions point to the enemy's probably defending the west range of mountains in preference to the east range. He may, if he has sufficient forces, do both. The west mountain range affords facilities for an active enemy to concentrate troops successively at various points, affording a variety of choice as to raids into the lowlands on either or both sides. The Sierra Madre did not have such facilities, and with its relative dearth of food is less likely to be the site of enemy centers of resistance. Of course the Japanese may have opened trails within the Sierra Madre and have prepared to occupy these rough mountains.

8. The general conditions in north Luzon are such as to enable a guerrilla warfare to be conducted for a considerable time. Just how long will depend upon what support, if any, the Japanese may receive from the local inhabitants. If the latter give information to the Allies but not to the Japanese, the hunting down of the latter will be greatly facilitated. If the natives (or some of them) give information to the Japanese, it will prolong the war in this area.

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# TRENDS in Field Artillery Organization & Equipment

*Although this column announces only approved changes, it does not constitute authority to requisition personnel or equipment listed herein.*

By Maj. Shirley B. Metzger, FA

Wire trucks in the headquarters and headquarters batteries of light, medium, and heavy motorized Field Artillery Battalions are being changed to delete one (1) Truck,  $\frac{3}{4}$ -ton, weapons carrier, and add one (1) Truck,  $2\frac{1}{2}$ -ton, 6×6, cargo, SWB, with winch. This change is made in an effort to give the battalion headquarters batteries more wire-carrying capacity. Since a unit cannot carry as a basic authorized load all of the wire that is laid, equipment tables normally authorize the maximum amount of wire that may be carried in organic wire laying vehicles. Wire laid in excess of this amount is to be secured from theater class IV wire stockages.

The range of the Radio Set SCR-619, or its substitute, Radio Set SCR-610, has not proven great enough for use in heavy artillery. To remedy this one (1) Radio Set SCR-608 is replacing the Radio Set SCR-619 in heavy service batteries. Two (2) Radio Set SCR-619 are being replaced by two (2) Radio Set SCR-608 in the heavy gun or howitzer batteries.

Cleaner, rifle, bore, a rust resisting oil, has been adopted for cleaning bores for all types of cannon however mounted. Allowances will be included in SNL K-1. Authorizations for soda ash will not be deleted from SNL K-1 because it has other uses than cleaning artillery bores. The new cleaner provides a reliable short-time preservative as well as cleaning properties.

Pack, field, cargo and combat, is replacing the Pack, canvas, field, and the Haversack in all Field Artillery units. The new pack consists of 3 components: cargo pack, combat pack, and suspenders: in addition, the Field Artillery is authorized the Strap, carrying, general purpose. Both packs can be worn on the suspenders. When desired the cargo pack can be detached and the

combat pack worn alone. In addition the pack can be used with the Strap, carrying, general purpose, without suspenders.

Beacon, survey, M1, a portable, easily erected and readily visible signal beacon for marking triangulation or other marking stations, is authorized in the Field Artillery Observation Battalion.

Detector set AN/PRS-3-( ), a short arm detector of metallic mines embodying the same principles as the Detector Set SCR-625-( ), which it replaces, is now standard in Field Artillery tables.

The Saddle, Phillips, pack, cargo, for Field Artillery will be designated as 23-inch. The 23-inch saddle possesses all of the characteristics of the present standard Saddle, Phillips, pack, cargo (25-inch), except that it shall be constructed with pads 22 × 23 inches. This change is prompted by the need for a saddle which will better fit the smaller animals now in use.

The Code Training Set AN/GSC-T1, which consists of keys, oscillator, and loud speaker, is being included in T/O & E on the basis of one (1) per gun or howitzer battery and one (1) per service battery, outside continental U.S. when authorized by Theater of Operations commander, to assist in maintaining the efficiency of radio operators already trained in code practice.

Interphone Equipment RC-99 will be included in the next published change to T/O & E 6-167, Armored Field Artillery Battery, on the basis of one (1) per gun motor carriage.

Provision is being made for arming observers on flying missions in Armored Artillery with the pistol instead of carbine. Allowances of pistols in both the Headquarters and Headquarters Battery, Division Artillery, Armored Division and Armored Field Artillery Battalion are being increased to provide two (2) pistols as organizational equipment for this purpose.

# Not in the BOOK

## SOME DRIFT OBSERVATIONS

Examination of the firing tables of the 105-mm and 155-mm howitzers shows that from ranges of zero yards to maximum range, the drift varies from 0 to 21. This is true in all cases except for charges 6 and 7 for the 155-mm Howitzer, in which the drifts are respectively 23 and 25 for the maximum ranges. More specifically: For a range of zero, the drift is zero; and for maximum range, the drift is 21, irrespective of which charge or howitzer is used (exclusive of the two exceptions mentioned above).

Since the elevations to obtain maximum range are nearly constant (minimum 768.6, maximum 805.2), it follows that if drift is considered as a function of elevation it might possibly be the same function for all charges on either weapon. Examination of the firing tables shows that this assumption is approximately true.

Since it is customary to fire a charge such that the range is not more than three-fourths of the maximum, elevations greater than 400' (when firing low angle fire) are seldom used. Thus the drift for elevations used in low angle fire may be readily committed to memory:

Elevation	Drift	
	105 Howitzer	155 Howitzer
200	2	3
250	3	4
300	4	5
350	5	6
400	6	7

As the drifts for high angle fire do not follow the straight line function shown for low angle fire, there is no simple method of remembering or calculating them. An empirical formula may be derived, however, which fits the function fairly well. By plotting the drift against the tangent of the elevation (for high angle fire), a fairly straight line is obtained.

From the resulting graph the following formula for drift may be derived:

$$D = 29.8 \tan E - 7$$

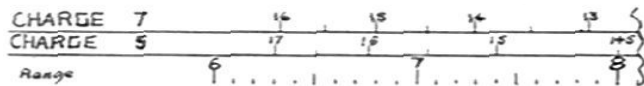
where: D is the drift in mils

E is the elevation in mils

CAPT. RAY K. WINEY, USMCR

## SITE AND COMP SITE DEVICE

Our battalion (155-mm Howitzer M1) has been operating in mountainous terrain where elevations run from zero to two thousand meters. Normal methods of computing the site plus comp site have proven slow: invariably computers have had to wait for VCOs to finish



computations before sending the quadrant to the battery. Here is a device that has eliminated the delay.

It is simply a chart showing site plus comp site for 10-yard differences in elevation. Above any range on the range scale the site plus comp site for a 10-yard difference in elevation can be read for that range and for the charge desired. This value, multiplied by the difference in elevation divided by 10, gives the desired site plus comp site for the target.

*Example:* Range to target is 7,800 yards and target is 350 yards above gun. What is the site plus comp site using Charge 5?

Above 7,800 on the range scale in Charge 5 column read site plus comp site for 10 yards' difference in elevation—1.47 mils.

**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.*

$$1.47 \times 350/10 \text{ or } 1.47 \times 35 = 51 \text{ mils}$$

Our chart is so constructed that it can be conveniently attached to the GFT over the upper guide or over the upper part of a computer slide; this slide can then be used quickly for the computation. Opposite D scale figure equal to site plus comp site for 10-yard difference in elevation, set index of C scale; under difference in elevation C scale read site plus comp site for target on D scale.

If elevations are in meters, the gage point on the C scale marked "m/yd" can be set opposite site plus comp site for 10-yard difference in elevation; under difference in elevation on C scale read site plus comp site for target on D scale. To prevent changing indexes a gage mark "m/yd" can be placed on the left end of the computer slide; if this gage mark is placed to the left of the left index on C scale, site plus comp site for the target can always be read on the D scale.

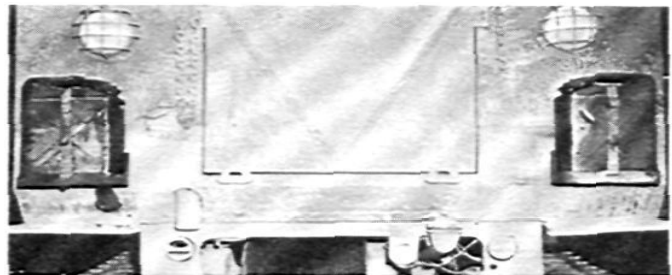
It is necessary to construct two charts, one for plus site and one for minus site.

MAJ. IVAN E. JACKSON, FA

## MODIFICATION OF M-4 TRACTOR

Tractor M-4 can well be modified by the addition of two brackets, one on either side of rear of vehicle body, for the purpose, of carrying 10 gallons of gasoline in two 5-gallon drums.

Since 2 drums, gasoline, 5-gallon, are allowed per tractor by T/O and E 6-357, and since no satisfactory provision is made for carrying the drums on the tractor, units equipped with this prime mover have adopted different methods of transporting the reserve gasoline supply, none of which have proved satisfactory. It is essential that the drums be carried



on the tractor. Carrying these drums in the box for water cans immediately in rear of and below the muffler hood or in the ammunition box, constitutes a definite fire hazard because of the high temperature engendered by the engine. Such procedure also displaces the water cans.

The carriers or brackets issued for carrying the 5-gallon drums can be easily bolted by 4 bolts to the rear face, as shown in the photograph. This work can be done by mechanics of Ordnance Department or of the using units.

COL. J. W. JEROME, FA

## "NEW MOUSETRAP" IDEAS

1. An extension to the radio handset for the SCR-610 will enable the radio to be operated from the vehicle, thereby saving batteries and insuring longer transmission range yet enabling the operator to be in a trench during shellings. German 4-strand rubber-covered telephone cable can well be used for this purpose.

2. A headlamp from a jeep used with an extension cord to the car battery can be used as an excellent CP tent lamp.

3. The M2 compass can be fastened to the cover of the binocular case and will not interfere with one's dive for a trench.

CAPT. EUGENE MAUREY, JR., FA

# Diary of War Events

(As Reported by the American Press—Edited by B. H. W.)

## MARCH, 1945

- 1st U.S. 29th Div captures Muenchen-Gladback and Rheydt in Germany.  
Allied fliers bomb Berlin and 10 rail centers.  
U.S. 41st Div invades Palawan, 5th largest island in the Philippines.
- 2nd U.S. 9th Army captures Neuss and Krefeld in Germany. U.S. 3d captures ancient fortress of Trier.
- 3d German troops retreat across the Rhine, blow up 3 bridges in front of U.S. 9th Army.  
RAF again bombs Berlin.  
U.S. troops invade Ticao and Burias in the Sibuyan Sea off southeastern Luzon.  
Lt. Gen. Millard F. Harmon (AAF Pacific Commander) and 9 companions missing on a transoceanic flight.
- 4th Allied armies race for the 3 remaining bridges across the Rhine River.  
Russian troops break through German lines in Pomerania and reach the Baltic.  
Allied bombers raid Formosa.  
Maj. Gen. Willis H. Hale becomes commander of all American air forces in the Pacific.
- 5th U.S. troops enter Cologne, 4th largest city in Germany. Red Army captures Stargard and Naugard.  
MacArthur reports 6 out of 10 Jap Divisions on Luzon, probably 90,000 men, have been destroyed.
- 6th U.S. 1st Army captures Cologne.  
U.S. 3d Army drives to within 20 miles of the Rhine and Coblenz.  
U.S. 5th Army gains control of roads leading from Bologna to Pistoia and to Florence.
- 7th U.S. 3d Army troops reach the Rhine near Coblenz. 1,200 U.S. planes blast oil refineries in the Ruhr.  
U.S. 5th Army gains 5 miles toward Bologna.
- 8th U.S. 1st Army troops cross the Rhine.  
8th Air Force planes bomb 6 oil plants in the Ruhr, RAF Mosquitos raid Berlin for the 17th straight night.
- 9th U.S. 1st and 3d Armies trap 5 or 6 German divisions as they join forces between Coblenz and Remagen.  
War Dept. reports new U.S. 15th Army under Lt. Gen. Leonard T. Gerow added to Gen. Bradley's forces.  
1,000 U.S. heavy bombers smash German industrial and communication centers.  
300 superfortresses bomb Tokyo.
- 10th 1,350 U.S. heavy bombers blast rail and communication centers in Germany.  
Red Army captures Lauenburg, Kartuzy on road to Danzig.  
Marines on Two cut Jap resistance into 3 sections for final kill.
- 11th U.S. artillery breaks up German counterattacks against 1st Army.  
Allied bombers drop 8,500 tons of explosives on Reich cities.  
1,000 RAF heavies smash Essen (home of Krupp plant), 2,000 U.S. planes pound submarine yards at Hamburg, Kiel, and Bremen.  
B-29s bomb Nagoya, Jap aircraft center.  
41st Div lands near Zamboanga (on Mindanao's southwest tip), encounters little opposition.  
U.S. 3d and 4th Marine Divisions break Jap lines on Two, capture most of the east coast.
- 12th U.S. troops launch 1st attack on east bank of the Rhine. capture 2 towns, advance 1¼ miles.  
White Russian Army storms Kuestrin, key fortress-city to Berlin.  
U.S. troops on Mindanao capture Zamboanga City and San Rogue airfield.
- 13th RAF bombs Essen, Dortmund, and Berlin.  
B-29s raid Osaka, Jap's 2nd largest city.  
U.S. troops capture 4 villages on Mindanao.
- 14th RAF bombs railway viaduct at Bielefeld, also hit Berlin.
- 15th U.S. 3d Army crosses the Moselle River and encircles Coblenz.  
U.S. heavy bombers raid the headquarters of the German General Staff at Zossen. Other U.S. and RAF planes pound enemy targets.
- 16th Allied air armadas pound German industrial and communication centers.  
300 B-29s bomb Jap city of Kobe.  
Organized resistance ends on Iwo Island.
- 17th U.S. forces capture Coblenz.  
2,000 U.S. planes smash German rail, communication, and oil plants.  
U.S. forces invade Basilan Island near Mindanao.
- 18th Gen. Patton sends 4 armored divisions deep into Germany.  
1,300 U.S. "heavies" bomb Berlin during the day, RAF follows up with a night raid.  
Russian army captures Kolberg, important port on the Baltic north of Stettin.  
B-29s again bomb Nagoya in Japan.
- 19th 1,000 tanks of U.S. 3d Army rout 80,000 Germans through Saar-Moselle-Rhine triangle.  
U.S. heavy bombers raid targets over the Munich—Leipzig area.  
Luftwaffe puts up a fight; our Mustangs shoot down 39.  
U.S. carrier planes raid Kure, Japan's naval base, and Kobe, the principal port.  
U.S. 40th Div invades Panay.
- 20th U.S. 3d and 7th Armies join forces west of Kaiserslautern.  
Admiral Mitscher's carrier planes raid Jap home fleet in the Inland Sea. Hit 17 warships and 6 carriers; sink 6 freighters and damage 7. During 2-day attack on Kobe—Kure area destroy 475 Jap planes.  
U.S. troops on Panay capture Iloilo airfield.  
British and Indian troops capture Mandalay, Burma's 2nd largest city.
- 22nd 3,100 heavy bombers and 1,500 fighters pound the Reich from front to front.  
Russian 1st Ukrainian Army captures Neustadt.  
U.S. troops capture Guimaras Island, 2 miles off Iloilo, capital of Panay.  
B-29s raid Rangoon.
- 23d U.S. 3d Army crosses the Rhine in force.  
U.S. troops capture Naguilian, 12 miles northwest of Baguio on Luzon.
- 24th 1,500 troop-carrying planes and gliders land thousands of paratroopers on the Westphalian plain.  
225 B-29s bomb Japs' Nagoya aircraft plant; lose 3 bombers.
- 25th U.S. 3d Army pushes 34 miles east of the Rhine.  
Pacific carrier planes smash a Jap convoy off the Ryukyus. Sink 3 cargo ships and 2 destroyers.
- 26th Carrier planes and battleships of U.S. 5th Fleet pound Jap airfields on Okinawa, in the Ryukyus.  
British capture Myittha in central Burma.
- 27th Allied armies continue widespread advances in Germany.  
Argentina declares war on Japan and Germany.
- 28th Russian troops capture Gydnia and enter Danzig.  
U.S. troops capture Cebu, 2nd largest city in the Philippines.
- 29th Allied armies continue sweeping through Germany against little resistance.  
War Dept. appoints Brig. Gen. Lucius D. Clay as Civil Affairs Chief for Germany.  
Russian troops capture Koeszeg and reach Austrian border.  
British task force joins U.S. Pacific Fleet in attack on the Ryukyus.  
U.S. troops invade Mactan and Cautit, small islands off Cebu's east coast in the Philippines.
- 30th 2,300 U.S. planes bomb 5 submarine bases in Germany.  
U.S. troops land on Negros Island.
- 31st U.S. Pacific Fleet continues for the 9th day its attack on Okinawa.  
U.S. troops capture Bacolod, provincial capital of Negros Island.





# For Heroism and Service



## PRESIDENTIAL CITATIONS

**Hq & Hq Btry, 82nd Airborne Div Arty,  
319th Glider FA Bn,  
320th Glider FA Bn:**

Action in initial assault on northern coast of Normandy, 6 June 44.

## OAK LEAF CLUSTER TO DISTINGUISHED SERVICE MEDAL

Lt. Gen. JACOB L. DEVERS, for service as Commanding General, ETO from 11 May 43 to 8 Jan 44, during the period of accelerated debarkation of our troops in England preparatory to the invasion of German-held Europe. He organized and directed the supply, maintenance, reception and training of the U. S. Army Forces.

## DISTINGUISHED SERVICE MEDAL

Brig. Gen. JESMOND D. BALMER, for service while Commandant, FA School, from 29 Jun 42 to 10 Jan 44. He commanded the FA School during the period of its peak enrollment of over 8,600 officers and enlisted men. His administration was marked by exceptional progress in the quality and organization of instruction.

Maj. Gen. STAFFORD LER. IRWIN, Comdg Gen, 5th Inf Div, for capturing Angers, France; mopping up in Chartres; directing operations against Montreau; securing Nogent sur Seine; advancing on Reims and continuing toward the Moselle River where a bridgehead was established.

Maj. Gen. HORACE L. McBRIDE, for exceptional leadership from 7 Aug to 11 Nov 44 of the 80th Inf. Div. in action against the enemy in France, Although sustaining great losses of key personnel, he reached and crossed the Moselle River on an extended front in a zone dominated by enemy-held high ground and strong points.

Maj. Gen. RAYMOND S. McLAIN, for service as commander of the 90th Inf. Div. from 31 July to 15 Oct 44. His sound planning, brilliant perception, and indomitable leadership inspired the Division to outstanding feats of pursuit and attack. The capture of more than 15,000 prisoners and the liberation of a large area of France is attributed to his service.

Maj. Gen. JOHN S. WOOD, for the successful employment of the 4th Armd. Div. from 17 Jul to 5 Nov 44 in campaigns of Normandy and Northern France. His division advanced over 1,500 combat miles against the enemy; he led his men from Carentan across the Cotentin and Brittany peninsulas and across France to the bridgeheads east of the Moselle.

## LEGION OF MERIT

Col. CRESWELL G. BLAKENEY, 6401 Delaware St., Chevy Chase, Md.

Col. JOSEPH P. DONNOVIN, Gainesville, Fla.

Col. JOHN P. ECKERT (CBI Theater, 17 Jul 44)

Lt. Col. KELLOGG W. HARKINS, Appleton, Wis.

Col. GEORGE A. A. JONES

## SILVER STAR

(Posthumously)

Maj. STANLEY C. SCOTT

## SILVER STAR

Lt. Col. BARRY D. BROWNE

2d Lt. JOHN P. BRUNSON

1st Lt. WAYNE B. FOSTER, 124 E. Maynard Ave., Columbus 2, Ohio

Col. GEORGE A. A. JONES

T/5 CAMILLO MATARAZZO

Pvt. ELLIE F. MOORE, RFD 1, Queen City, Tex.

2d Lt. CARL W. MOOT, JR.

Capt. GILBERT E. OLESON

Sgt. WAYNE R. SNYDER, Blossvale, N. Y.

2d Lt. AUGUSTUS VAN CORTLANDT, III

Cpl. JOHN D. WEBSTER, Modesto, Calif.

## AIR MEDAL

1st Lt. HAROLD C. COLE

Maj. PAUL V. FAHEY

1st Lt. JOSEPH C. FOWLER

## ROLL OF HONOR

**COMMANDER - IN - CHIEF FRANKLIN DELANO ROOSEVELT, died 12 Apr 45; Warm Springs, Ga.**

**Lt. ROBERT W. BARROW, killed in action, 13 Nov 44; Southwest Pacific.**

**Col. PAUL A. CANNADY died, 21 Jul 44; Santa Barbara, Calif.**

**Lt. WARREN G. CONRAD, O-1166249, killed in action, 27 Dec 44; Germany.**

**Capt. ALLAN L. CRAIN, killed in action, 29 Oct 43; Italy.**

**Lt. JAMES S. DOYLE, JR., killed in action, 13 Nov 44; Germany.**

**Capt. J. A. FLOWERS, O-409394, killed in action, 28 Dec 44; Belgium.**

**Lt. ALBERT J. HAWLEY, died, 12 Dec 44; Fort Lewis, Wash.**

**Capt. SHELBY J. HILDEBRAND, killed in action, 11 Aug 44; France.**

**Lt. JULIAN S. JOHNSTON, O-1176085, killed nonbattle, 15 Sep 44; New Guinea.**

**Lt. MILTON G. McATEE, O-1324555, killed in action, 29 Oct 44; Southwest Pacific.**

**Lt. JOHN H. MacLEAN, O-514720, killed in action, 21 July 44; France.**

**Lt. CHARLES S. MERRILL, O-1168820, killed in action, 30 Jul 44; France.**

**Lt. PHILIP N. NUSBAUM, killed in action, 25 Oct 44; Leyte.**

**Lt. JEROME J. SHELDON, killed in action, 28 Oct 44; France.**

**Lt. JOSEPH TALOSI, O-1168941, killed in action, 12 Nov 44; France.**

# BOOK REVIEWS

*JANES FIGHTING SHIPS, 1943-44.* Edited by Francis E. McMurtrie, A.I.N.A. 582 pp.; illustrated; index. The Macmillan Co. \$19.00.

*JANE'S ALL THE WORLD'S AIRCRAFT, 1943-1944.* Compiled and edited by Leonard Bridgman. 439 pp.; illustrated. The Macmillan Co. \$19.00.

Despite wartime handicaps of secrecy, censorship, and sudden changes of design, these latest records of progress and of the state of the arts are as outstanding as ever. Both of course are classics in their fields.

Since 1897 *Jane's Fighting Ships* has been the acknowledged world authority, and the most complete and authentic encyclopedia of all the world's navies. This new edition, corrected to July, 1944, contains a great amount of new information and 400 new photographs. Nation by nation it outlines insignia, gun types, appropriations, ship classification, nomenclature, etc.; shows silhouettes of all types of fighting ships of the navy; then exhaustively, by types and by classes, gives major specifications, photographs, sketches, and constructional details. It is truly a magnificent reference book.

*Jane's All the World's Aircraft* of course had a later start, but this is its 33d year of issue. In it is found a complete record of aeronautical progress throughout the world during the year covered. In four parts it covers progress in service and in civil aviation, and all the world's airplanes and aero-engines. Within each part all nations are dealt with in alphabetical order. The civil section for the U. S., for example, gives a summary of governmental authorities; war training information; the state of private flying (including the CAP); a list of associations and publications, with their addresses; a summary of civil airlines services, followed by a list of all operating companies and their routes; and a vast amount of useful statistics concerning our civil aviation.

Both volumes are outstanding for the care given to assure completeness and accuracy. They are replete with effective illustrations. Neither could be sold at this price without the cooperation of the manufacturers and suppliers whose advertisements help cover production costs.

*SEA LANGUAGE COMES ASHORE.* By Joanna Carver Colcord. 213 pp.; illustrated. Cornell Maritime Press. \$2.25.

The English language as a whole is broader and more colorful than any other. This is because of its diverse origins—from the Greek, Latin (including its derivatives), and the Scandinavian.

For similar reasons "American" English is perhaps enlivened more than "English" English. We have drawn heavily on the language of the sea. From New England and the old Long Island whaling ports our vessels sailed the world over. And because our country was still growing back into the interior, most of the inland residents had at one time a close connection with the shore. Thus sea language spread deep into the interior, where it became a part of common speech. Now many seagoing phrases are used correctly by landlubbers who were never within a thousand miles of open water.

These gone-ashore expressions are Miss Colcord's subject. Herself a descendant of five generations of seafarers, born at sea, and practically reared there, she knows whereof she speaks. And in defining and illustrating these words by shrewd and humorous examples, she has for the first time gathered these expressions together. It's a fine book for any lover of the sea or its coasts, student of American regionalism, or collector of Americana. Also, any lover of words will find a whole new world opened up for him.

*WINGED PEACE.* By Air Marshal William A. Bishop, RCAF. 175 pp.; illustrated. Viking Press. \$2.75.

Air Marshal Bishop wants the "average man" to see the potential danger of the present air age. His thesis is that aviation is a destructive force which if left to individual nations will become "Winged Death." Both civil and military aviation must be organized under a world government to assure "Winged Peace." The thought is an arresting one even when couched in more prosaic terms, and is worth our consideration.

The author's argument is based chiefly on the power of the air weapon as revealed in the present war and his vision of the terrors of the immediate future, particularly from jet- and rocket-propelled projectiles. The former cannot be denied—and as to the latter, who will say what is impossible tomorrow? These thoughts are principally developed in the last part of the volume ("Where Do We Go from Here?").

Like a great many air power books, it is essentially based on a plea to the emotions, with a scattering of technical references. Perhaps this is the only way of reaching the notice of the "average man." There will always be debate about this person's intellectual capacity because he is as fictitious a character as the legal phantom called "the reasonable man." But what would be an effective oral plea becomes weak in cold type in spite of a profusion of rhetorical questions, italics, and a conversational style of writing. There should have been more consideration of the various plans for post-war aviation and their shortcomings as compared to the international control proposed by Air Marshal Bishop.

Unfortunately, the bulk of the book is not directly related to the main thesis. It is a turgid collection of personal theories dogmatically stated, personal reminiscences (particularly about World War I), snatches of air and military history (in some instances strangely naive), and various remarks about different subjects—all of which add nothing to the argument.

Indeed, they detract from it. The first chapter deals with maps. It is disconcerting to read the first paragraph, which is based on the statement that "some of the scientific gentlemen" of the days of Columbus "were convinced that they were living on a flat, or wafer-like world and everyone else took their word for it." Particularly in view of the many references to Columbus in this connection. Air

## DISCOUNT OFFER AND MAILING DATA

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Marshal Bishop or his researcher should have glanced, for example, at Commander Morison's *Admiral of the Ocean Sea* for some reliable information about the geography of that date.

It is regrettable too that the author did not allow his earlier book *Winged Warfare* to be his sole contribution to World War I. That was obviously his personal memoirs, and the statements in it were his personal opinions. But when the current volume turns to the last war, we expect that the author's perspective would have widened with the opportunity for mature reflection and research during the years and that his statements would be less personal and more in the nature of a weighed history. But that is not the case.

The fervor of the author's plea almost makes one overlook the book's shortcomings—but not quite. J. R. C.

*AIRCRAFT ARMAMENT.* By Louts Bruchiss. 224 pp.; illustrated, *Aerosphere, Inc.* \$6.00.

In one large-paged volume have been gathered together as much data concerning aircraft armament as can be published these days. This includes not only material officially released by our air forces, but also enemy estimates of certain fire power and details from patent office files, to help fill in the gaps. Detailed characteristics, manner of operation, etc., are given for bombs, machine guns, cannon, torpedoes, ammunition, turrets, armor protection, etc. Foreign aircraft weapons are discussed and illustrated, as well as AA weapons. Gunnery training is described. Self-propelled ammunition and bombs, including rockets, have a chapter. And the author takes a shrewd look at the possible future of aircraft weapons and air warfare.

Compilation of this material must have been a slow and painstaking job. It was done by an associate editor of *Aerosphere*, as a logical extension of briefer material published by that magazine two or three years ago. His accuracy—and the worth of this labor—is attested by a foreword by the Air Ordnance Officer of the USAAF.

*ENCYCLOPEDIA OF KNOTS AND FANCY ROPE WORK.* By Raoul Graumont and John Hensel. 640 pp.; index; illustrated. *Cornell Maritime Press*, \$5.00.

Tradition says that sailors on the old wind-jammers spent a lot of their spare time working with rope, devising knots and ornamental work. Never, though, did I imagine there was such an infinite variety of knots, so many kinds of working ones in daily use as well as of fancy ones! This encyclopedia is an eye-opener. It covers the whole field in a fascinating and a practical way.

332 of its pages are full-page plates showing clearly and precisely the detailed steps in fashioning all manner of knots, from the simplest to the most complex. Although some of these are line drawings, most are amazingly clear photos, made with a lighting technique that shows exactly what is meant. Along with these, and well keyed, is lucid text that plainly describes each operation. Practical uses are thoroughly covered, whether it is the making of fish nets or rope ladders, or fashioning belts, rugs, or handbags. An excellent chapter on splicing wire rope is of direct use in these days of cables.

Both authors are young seamen, one French and the other Danish. Each had learned all he could from the old salts. Learning of their common interest, they sailed together and gradually put their material together. It is a happy collaboration—especially for those who come to know this magnificent book.

Incidentally, it is astounding that it can be produced for this price. Earlier editions sold for double the amount. The publishers are to be congratulated for keeping the price of this third edition at rock bottom. Result: buyers get a real bargain, as well as the wellspring for countless interesting and profitable hours.

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The Goebels' book is of particular interest at this time, when a great war is bringing into great prominence many men of arms. It takes a good, long look at the history of our prejudice against the professional soldier, then examines the military and political careers of our general-presidents (professional, semi-pro, and amateur). Washington, Jackson, W. H. Harrison, Taylor, Pierce, and Grant are treated in considerably more detail, of course, than are Hayes, Garfield, and B. Harrison. Finally there is a careful analysis of the effect of military service on the election of these men, and on their presidential acts as compared with those of complete civilians.

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*G. I. SONGS. Edited by Edgar A. Palmer. 246 pp.; index; illustrated. Sheridan House. \$2.00 each.*

Mr. Hersey pored over countless copies of camp publications, culling out the cream of the G. I. humor (including cartoons) appearing there. From these soldier-made magazines and newspapers came these collections of the men's own idea of the laughable. There are letters that were never sent home, poetry (?) on every idle-hour subject, samples from every theater. Most of the gags are as good as they are straightforward. Best of all, they're authentic—not what someone at home thinks soldiers ought to laugh at, but what they themselves found worth publishing.

*G. I. Songs* is of about the same ilk. It brings a wide range of songs written, composed, and/or collected by service men. "Official" songs are omitted, but many an old favorite is here—although generally with a new set of words that the original writer would never recognize. In many cases, too, some of the lustiness of current versions has had to be toned down by substitution of weasel-words. Even so, it's a swell collection. In some instances piano scores are included; in most of the rest the melody is given. And in most cases you'll know the tunes, anyway. They're tried and true.

*WHEN THE FRENCH WERE HERE. By Stephen Bonsal. 252 pp.; index; endpaper map. Doubleday, Doran & Co. \$3.00.*

In our Revolutionary War French troops as well as the French fleet helped finally force a decision. Their part is little known, at least as to details. Sailing from France in May, 1780, after a difficult passage they landed in Narragansett Bay. Strangers in a land of unfamiliar manners and severe climate, they wintered that year at Newport. In 1781 they made a great march to the south; boats for a few were found along the way, but most went afoot as far as Annapolis. All were reunited before Yorktown, where French ships and soldiers had much to do with Cornwallis's defeat. A winter in Williamsburg was followed by a return trek to Rhode Island and ships for home.

This is essence is Col. Bonsal's narrative of the Yorktown campaign. Its writing, however, was a tremendous project. So lost was the story that not even the French camp sites were exactly known before his research. Source material was scattered through the two countries.

Preparation of this book was a labor of love, though. A close friend of the late M. Clemenceau, Col. Bonsal had long planned with the "Tiger of France" to make a pilgrimage over the route of the French. It was in this period that the records were examined, the itinerary traced out, details brought to light. Death prevented the joint journey, but out of that personal project came this magnificent vignette of history, Col. Bonsal's tribute to our French allies.

*ARMY OFFICER'S NOTEBOOK. Infantry Journal. \$1.00.*

Four years ago this notebook was first compiled and distributed by the Addressograph-Multigraph Corp. Besides a plastic template-and-protractor in a pocket, and a number of blank pages, it contains a fair amount of such reference data as characteristics of weapons, pay tables, conventional signs, checklist for orders, etc.

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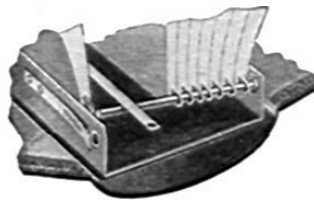
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