

*The*  
**FIELD ARTILLERY**  
*Journal*



SEPTEMBER, 1943

# FIELD ARTILLERY GUIDE

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

# The Field Artillery Journal

"Today's Field Artillery Journal is tomorrow's Training Regulations."

SEPTEMBER, 1943 — Vol. 33, No. 9

OUR FRIENDS of the Navy continue to provide excellent photos of Army artillery in action. This month's cover shows a 105 position on Attu, well supplied with ammunition with which to blast the Japs from the hills.

TWO BITS of outstanding news come from Fort Sill. Of prime importance is complete abandonment of that hybrid sensing. "Range approximately correct"; henceforth targets *must* be bracketed so that effective ranges will be determined with certainty. Second, the familiar "red books" are no more; for details, see page 665.

SHRAPNEL is an ancient and honorable word—and a term with a definite technical meaning. In this war, however, it has been perverted and distorted beyond all recognition. The Germans have used a few rounds of true shrapnel (Col. O. W. Martin found to his amazement that it was a shrapnel ball which struck his arm), but this ammunition is so rare as to be practically a museum piece. Certainly, "shrapnel" wounds are *not* the result of bombs or AA fire, as most newspapermen would have us believe.

We thought that army personnel were aware of the ancient distinction between shrapnel and shell splinters. But the *Camp* ——— *Dispatch* for July 23d prominently featured on its first page a yarn about how "a piece of shrapnel from an exploding [peronne] mine was stopped by the lieutenant's [helmet]"! Obviously it could not have been shrapnel. Equally obviously, we can not expect civilians to observe technical facts when some of us ignore them. Public Relations Officers, please copy!

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

# BATTLE PERFORMANCE *of* FIELD ARTILLERY



LT. GEN. LESLEY J. MCNAIR, Commanding General, Army Ground Forces, has sent the following letter to BRIG. GEN. JESMOND D. BALMER, Commandant, Field Artillery School:

1. You are well aware of the high praise which the artillery has received for its performance in battle—praise which comes from all active theaters and not from artillerymen alone, but from high commanders and the infantrymen as well. I personally can testify as to the outstanding effectiveness of the artillery support during the final battle in Tunisia. General Eisenhower has just stated in a message to the War Department, "Work of artillery has been of highest order."

2. The expansion and training of the artillery, from the beginning of the current emergency, has been based on a policy different from that in the World War. Then, artillery units were formed and trained in special artillery training or firing centers, and joined the other arms only after their technical training was complete. In fact, in many cases of necessity the division artillery virtually joined its infantry on the battlefield. The advantage of this procedure was that the few available and qualified instructors were utilized to the utmost in spreading their knowledge among the vast mass of untrained artillerymen. In the present emergency, the artillery has been born and has lived constantly with the infantry, even during the early stages of its technical training. Criticisms have been made that tactical training of the artillery is being overdone to the detriment of its technical training.

3. The battle results in the matter of artillery support have demonstrated conclusively that the current artillery doctrines are sound, and probably the most advanced in the world. Further, units have been trained by their own officers, exemplifying the soundness of the old principle that the instructor of a unit should be its commander.

4. The practicability of the system employed in this emergency, with the attendant outstanding success, is due, in my judgment, almost wholly to a single factor—the Field Artillery School. In the World War, we had too few trained officers to permit the system now being used. Since the World War, the Field Artillery School has been pouring forth class after class of officers and enlisted men who not only know their own duties, but who have demonstrated outstandingly that they were able to impart their knowledge to the huge war army now in being, and prove itself so convincingly on the battlefield.

5. I commend and congratulate the Field Artillery School on both its past and present great achievements.

In transmitting this letter, MAJ. GEN. HARRY F. HAZLETT, Commanding General, Replacement and School Command, made the following indorsement:

I desire to add my personal commendation and congratulations to those of the commanding general of the Army Ground Forces. The devotion and professional attainments of those who have assisted in the development of field artillery doctrines and technique have been of an exemplary order. The battlefield achievements of the artillery arm have enhanced the prestige of the entire American Army as well as its own reputation.

GEN. BALMER added the following indorsement before presenting photostat copies of this letter to officers\* representing the departments and troop commands of the school:

Field Artillery everywhere can be proud of the achievements of the Field Artillery School. Diligent and loyal efforts of hundreds of officers and soldiers in past years laid the foundation and made possible our success. Thousands of citizen soldiers, now indoctrinated with the principles and spirit of service of the Field Artillery, hurl our fire on the enemy.

I commend all personnel of the Field Artillery School, both past and present, for these splendid contributions to the success of our arm.

---

\*Brig. Gen. Charles R. Doran, commander of the 17th Field Artillery Brigade, Field Artillery School troops; Col. Lawrence B. Bixby, Field Artillery School assistant commandant; Col. John J. Binns, director of the Tactics department; Col. Clyde M. Hallam, director of the Motor Transport department; Col. William W. Ford, director of the Air Training department; Lt. Col. Ralph R. Mace, director of the Communications department; Lt. Col. Lester L. Boggs, commander of the Field Artillery School detachments; Lt. Col. Claude A. Billingsley, department of Gunnery; Maj. Milton E. Ross, Materiel department; and Maj. Gilbert M. Payne, Animal Transport department.

# BATTLE of SIDI BOU ZID: 15 Feb. 43

By Lt. Col. Edwin H. Burba, FA

Prior to the night 14-15 February, our "B" Btry had been detached to K— force and "C" Btry to CC "C." At 0230 hours on the 15th I was summoned to HQ Div Arty and received orders to detach "A" Btry to division control in present position, proceed with HQ and CTn to "B's" location and resume control of it, and with those units join "C" Btry as it passed by with CC "C," marching from the north. Our battalion (less "A" Btry) was attached to CC "C," whose mission was to attack east through Sidi bou Zid to Dj. Kaaira, hook north past Dj. Lessouda, and return to near "B" Btry's present position, taking from each hill mass all elements of the KFRth Inf surrounded there.

The head of the column came along at about 0900 hours, and my elements joined an hour later. Soon the CC went into an assembly area—during which operation 4 dive bombing attacks were made against the part remaining on the road. Here I reported to Col. S— and received his order and plan; this was as above-stated, with the addition that the 3d Bn Uth Armd Inf would pass through the 2nd Bn Zth Armd Regt when resistance was met, and attack.

At approximately 1100 hours the 2nd Bn Zth Armd Regt jumped off, deployed in column of platoons and with elements of the GTKth TD Bn on the flanks. The terrain was flat, slightly dominated by high ground of the assembly area. Weather was clear.

Noting the tanks' rapid advance and seeing no signs of enemy activity short of Sidi bou Zid, which could be seen with field glasses from the assembly position, I realized my two batteries could not stay within supporting range if they advanced by bounds. I therefore deployed them with SP howitzers in line, batteries in column, in the order "B," "C," HQ, and followed the attack. Our three FOs were with the leading elements of the tanks, the leading battery 1,500 yards behind the rear echelon of tanks.

Before long a fire mission was received from FO-1, and a battery concentration delivered on an AT gun. Displacement was then made by battery to new positions, where fire missions came from FOs 1 and 2 faster than they could be delivered. On reaching this position, "B" Btry received counterbattery fire and displaced laterally on my order while "C" Btry was



*Sbeitla, east of Kasserine Pass, is not quite so barren as the Gafsa—El Guettar—Sened area, farther south. A 75-mm gun has been mounted on this German armored car; this vehicle can be driven in either direction, and uses all eight wheels for steering.*

adjusted on the enemy battery by FO-2, who immediately located it by its flashes northwest of town. The battery was silenced. Another battery south of the town then opened, and FO-1 adjusted the battalion on it.

At this time on our right flank a column of dust was observed approaching the town, and FO-2's attention was directed to it by radio message. Since it was not known whether these were enemy or friendly vehicles, he did not ask for fire until they were close in and deploying in vicinity of an olive orchard south of town. They were then positively identified as approximately 40 PzKw IVs.

Just prior to the arrival of the 40 tanks from the south the CO 2nd Bn Zth Armd Regt issued an order sending one company to over-run the battery northwest of town, another to do the same to the battery south of town, and the third to attack the town itself. After they had moved out he received warning of about 20 enemy tanks approaching from the direction of Faid Pass, so he diverted the company attacking to the left to meet this threat. Shortly thereafter the company enveloping the south was caught in flank by the 40 tanks, and the one to the north was engaged by the 20 arriving tanks.

The center company (with which the CO went) was engaged in the outskirts of the town by infantry with numerous AT weapons. By its overwhelming numbers the enemy attack on the right flank carried through behind the center company. FO-2's tank was hit four times, the first round setting the motor afire and wounding him slightly—but under cover of smoke grenades he dismounted, extinguished the flames, and got back into the tank. His radio was not damaged, so he continued adjusting fire and sending in reports from the knocked-out tank by throwing out grenades before enemy tanks came too close and so leading them to believe his tank was burning. However, he was behind enemy tanks from

---

**This account of operations at Sidi bou Zid bears out the theme of much of our training doctrine: disperse vehicles, emplace weapons so that they are mutually supporting, establish a comprehensive, all-round warning system. In addition, it emphasizes the artillery's need for skill in dismounted patrolling (by day and by night): individual ability to move cross-country at night, either mounted or on foot, will frequently spell the difference between safety and capture.**

---

that time on and could not accurately report the activity of our own tanks, although he could and did find plenty of targets of opportunity for our fire. His reports were all that did come in, since FO-1's vehicle was knocked out completely and FO-3 was and still is [at time of writing] missing from that action.

At about 1700 the CO 2nd Bn Zth Armd Regt reported that he was in town and that things were not too bad. I think, however, in view of information subsequently received, that he was not at that time fully aware of the situation of the two flank companies.

At 1715 the commander of "C" Co Uth Armd Inf came to my CP near the gun positions, and told the executive officer that he had his company right behind us and that the other companies of his battalion were behind him, mounted in their half-tracks. Reports now came from flank outposts, of unidentified tanks moving to the rear on our right flank. Very shortly thereafter enemy tanks fired on us from our right rear. The direct fire was very heavy for about ten minutes, but when "C" Btry returned the fire and knocked out two tanks, the rest backed off into hull defilade some 1,200 yards away and halted. Only eight tanks exposed themselves, and I presume that the whole force was on that flank.

Another group of four German tanks (PzKw IV) came in from the left front while we were engaged from the rear. But I had given only "C" Btry action rear, so as these tanks were covered by fire from "B" Btry they also halted, about 1,400 yards away in partial defilade.

After this action I looked around—all the vehicles which had been nearby were gone, and none of the Uth Inf vehicles passed through my position.

Then I assigned semi-circular sectors to each battery and had my CP vehicles in the center, all at least 100 yards apart. While awaiting darkness I gave FO-2 a compass course from his position to meet a patrol after dark. Orders were then given the BCs and staff for withdrawal one hour after dark, using the howitzers and AT guns as advance, flank, and rear guard

screen, with officers in command of each group. A mountain on the horizon was designated to march on.

Enemy tanks were still in position at dark, but evidently withdrew shortly thereafter. This battalion executed its withdrawal at about 1915 hours—according to plan, without incident. On reaching the base of the mountain and reassembling, the march was resumed to the CC assembly area. Only four tanks of the 2nd Bn Zth Armd Regt had returned when we arrived. FO-2 missed the patrol, which returned as ordered after 30 minutes of lateral patrolling in the area prescribed; he reached the assembly area at 2330 hours, after a considerable hike. FO-1 arrived at 0100 hours 16 Feb., having walked from his hiding place in a wadi north of the town, near where his vehicle had been hit.

Targets in this action were two enemy batteries, two separate AT guns, one concentration on infantry in the town just prior to the center company's attack, and two concentrations on enemy tanks while assembled. Both gun positions and CP were exposed because of the complete absence of any defilade. Overs and misses from the tank battle rained into the positions with considerable intensity for over an hour and a half, and direct fire from enemy tanks for about fifteen minutes. No men were wounded and no vehicles were lost in the battalion area.

It can therefore be presumed that an armored FA battalion can, if necessary, occupy exposed positions without undue losses, provided that vehicles are properly dispersed, batteries are mutually supporting, and all-around security posted. This should not, however, be construed to include defense against direct attacks by infantry, as Sidi bou Zid yielded insufficient experience to justify that conclusion. Subsequent experience has proved that dismounted patrols, operating a short way from light radio cars, should remain in contact with enemy tanks when attempting to disengage at night. Dismounted patrols can go very close to enemy tanks in the darkness with comparative safety, and having identified them before darkness can check and report every move they make.

#### ARMED ARTY INCIDENTS

On February 15th at Sidi bou Zid we were surrounded, but held out 'til dark and knocked out two tanks with direct fire; about an hour after dark we slipped out without loss. K——'s tank received four hits, but he continued to observe; every once in a while he would throw out a smoke grenade—the Jerries thought he was burning, and so let him alone. One tank attack went right past him, and he was able to adjust fire on it from its rear. With his motor knocked out and Jerry holding the ground, it was impossible to salvage his tank. I gave him a bearing and after dark he walked out with his tank crew, bringing everything they could carry.

Without orders, everything fell back from the front on the night of February 16/17, and in the confused situation we took a direct tank attack. H—— took very aggressive action when he first saw the forward elements passing his position on the left flank. By prompt reports from the foot patrols he sent out, the tanks were identified in time to hold them off with fire. He knocked out three. The battalion held its front-line position until ordered out at daylight, then it kept the front covered with fire during the retrograde movement throughout the next day.

According to reports from engineers and tankers as well as from our own FOs, our fire was very effective against motorized infantry. It is a great feeling to hear an FO report, "40 tanks are assembling in area of concentration No. 4. Now they are close together and personnel getting out. Fire when ready." S-3: "Battalion 3 rounds at my command." Then we hear, "Cast ready," etc. And finally, "Battalion, FIRE!" The same thing happened with entrucked infantry as the target.

In the last action at Kasserine we tried the Russian method: quickly adjusting by high burst on German assembly flares, we walked down the road with concentrations at 300-yard intervals. It worked especially well, since wadis prevented cross-country vehicular travel. By deflection shifts we had good luck in following even the curves of the road, and R—— (who was in contact) said it was the maddest scramble he ever saw. The enemy infantry retreated four miles, leaving 4 infantry cannon, 2 20-mm guns, a 47-mm AT gun, a staff car, a loaded supply truck, 2 tanks, and all their personal equipment.



*El Guettar itself, as seen from the east*

## EL GUETTAR: MARCH 25 - APRIL 8, 1943

By Col. Douglas J. Page, FA

Late in the afternoon of March 25th, 1943, the 9th Div Arty was notified that it would move to bivouacs in the vicinity of Gafsa. At dusk the BPth FA Bn moved from its positions in the vicinity of Kasserine. It was followed at 0200 on March 26th by the 2nd Bn 17th FA (105 How) which had been attached previously to partially replace the loss of the PJth and HNth FA Bns, which were attached to the 1st Armd Div. The MDth FA Bn, followed by HQ, 9th Div Arty, moved across the IP at the railroad underpass near Kasserine at 0800 March 26th, 1943.

The Div Arty Comdr, who had remained at the 9th Div CP to coordinate the march of the division to Gafsa, left the CP near Kasserine at 1000 March 26th and traveled through Thelepte and Feriana to Gafsa, where he was met by the division commander and the commanding officers of his artillery battalions. The HNth FA Bn reverted from control of the 1st Div upon the entrance of the 9th into the engagement.

The enemy held all the high ground at the southeast end of the El Guettar valley, principally Djebel Berda (or Hill 772), Djebel Lettouchi, Djebel el Kreroua, Hill 369, Djebel el Mehettat, Hill 536, and thence to the north and east. Our 1st Div had driven the enemy back to that line and were holding the entire front. When the 9th Div arrived on March 26th it was assigned the sector from a line about one kilometer to the north of the Gafsa-Gabes road and parallel to it, to the range of mountains on the right (of which Djebel Berda was part). The 1st Div moved to the northeast of the Gafsa-Gabes road. On the right of Djebel Berda were the French forces who were holding the valley just south of Djebel Berda.

After a conference as to possible positions and a map study of the enemy situation and the terrain, the Div Arty Comdr and the commanders of the four battalions went forward on reconnaissance. The enemy situation was such that the only positions available were out on the open plain, directly under the observation of the enemy forces—who had on Hill 772 an OP which dominated the surrounding country.

Positions were selected and routes reconnoitered, parties returning to the Div Arty CP which had been established in the palm grove at El Guettar. There messages were received that the attack was postponed 24 hours, and that units would remain in bivouacs for the night of 26-27 March.

During the day of March 27th the battalions continued reconnaissance, and at 1300 the BPth FA Bn, followed by the 2nd Bn, 17th FA, moved to the south and east around Chott El

Guettar to a bivouac in wadis to the south of the Chott. At dusk they occupied the positions previously selected. The HNth FA Bn, which had been supporting the 1st Div, remained in their same positions and shifted their support to the 9th Div. The MDth FA Bn left their bivouac at dusk and followed the 3rd Bn NQth Inf to positions along the Gafsa-Gabes road.

All positions were thoroughly dug in, and preparations made to support the attack at 0600 March 28. No registration was permitted until after 0600 and radio silence was ordered until that time. 2nd Bn 17th FA and the BPth FA Bn were placed in direct support of the NQth Inf. The HNth FA Bn was placed in general support along with the MDth FA Bn. 150 rounds of ammunition were ordered dumped at the gun positions; the trains were to be replenished at the Gafsa DP immediately.

No plan of offensive fires was permitted by the situation. All units sent out forward observers, to be in position to support the attack by observed fire. Firing was light throughout the day. Some battery positions were located and fired upon. At 0835 the CO, BPth FA Bn, requested permission to displace forward. This was granted and "A" Btry was sent forward. This battery was shelled while on the road, but no damage was done and the battery occupied the position. Later the remainder of the battalion moved to the new position. No other unit moved forward throughout the day. Harassing fires were placed on lines of communication throughout the night.

Early on the morning of March 29th the attack was continued. The enemy was driven back along the entire line. Artillery fire delivered was considerably increased, and was reported as very effective. "C" Btry of the MDth FA Bn, which had moved forward at 0300 to positions in the vicinity of 30688—68156, was heavily shelled throughout the day. Enemy artillery registered on each gun and tried to knock the battery out. Damage was very slight, one 2½-ton truck of the AA being destroyed. The advance was again halted by the enemy, and the positions were stabilized for the night. The Div and Div Arty CP was harassed by enemy planes throughout the night, these being overhead at least eight times. "C" Btry established a dummy position where they had been shelled, and moved about 500 yards to new positions.

The morning of March 30th a planned 20-minute offensive fire was prepared to launch the infantry attack at 0600. Requests

were made to Corps Arty for additional support, and the KGRth FA Bn (155 How), the 1st Bn 17th FA (155 How), and the 1st Bn CPth FA (155 Gun) were assigned to assist in the preparation. Fifteen battalion concentrations and six battery concentrations were placed on Djebel Kreroua and Djebel Lettouchi, and some fire on Hill 369. Our infantry advanced and were able to take part of Djebel Lettouchi. They were then driven from their position by a determined enemy counterattack. Continued heavy fighting was experienced throughout the day, during which the enemy artillery fired on the dummy position established by "C" Btry, MDth FA Bn. They hit a can of gasoline left at the position and started a fire. This was evidently taken as a hit on a battery, for the enemy continued to shell the position throughout the day and wasted a large amount of ammunition. Survey of the front lines by the artillery survey party proved that the infantry had not reached their objective. Bombing of the Div and Div Arty CPs continued throughout the night. Mostly the raids were of a harassing nature and were continuous throughout the night.

The following day, March 31, the action was very light. Our infantry attempted to filter through the enemy lines. The artillery fired very few rounds, most of which were on targets of opportunity and harassing missions. Enemy air activity was almost continuous throughout the day; these attacks were mainly of a harassing nature and very ineffective. Div CP and Div Arty CP were again harassed continually throughout the night by enemy planes circling and dropping flares and bombs. Damage was slight and effect was poor, as personnel had learned to sleep in trenches. An amusing incident of the day was the surrender of 100 Italians to one man from the MDth FA Bn.

On April 1st the action continued to be light, although enemy tanks were reported several times throughout the day. Several of these were destroyed by artillery fire at maximum ranges. The MDth FA Bn destroyed one 88-mm gun, and the BPth FA Bn fired on enemy personnel with excellent effect, killing a large number. The day was marked by considerable shelling by enemy artillery and considerable plane activity. CPs of Div and Div Arty were again harassed during the night, but on a decreased scale.

Enemy tank activity increased on April 2nd and the result was a large number destroyed by artillery fire. The BPth FA Bn destroyed at least eight tanks during the day. A number of trucks were also destroyed, with a large amount of enemy equipment. If it did nothing else, the day's action proved the effectiveness of 105-mm fire against tanks at extreme ranges, practically the entire day's firing being at ranges of 10,000 to 12,000 yards. This was true of the entire engagement, due to lack of cover afforded by the terrain at closer ranges. On the night of April 2nd the

division artillery survey section surveyed the front lines by firing rockets and triangulating them in. Results were excellent, and the front line battalions were definitely located; they were found not to be where they had said they were.

April 3rd was quiet throughout most of the day. Firing was normal, and the enemy seemed to be withdrawing. Fighting was heavy throughout the afternoon and the artillery fired a considerable number of rounds in a preparation at 1600. The infantry advanced and was able to seize Djebel Lettouchi. At 1800 the BPth FA Bn was heavily bombed by a flight of 18 Ju-88s, 4 Me-109s, and 8 FW-190s. Damage consisted of one 2½-ton truck slightly damaged, and 6 slight casualties. Reports indicated that our fighter planes and antiaircraft were very effective, shooting down 14 enemy planes. A point of interest was the attempt of the 4 Me-109s to draw off the Spitfire cover by making a diving attack at another point prior to the attack by the bombers. The Spitfires did not fall for the trap. The MDth FA Bn moved "C" Btry to a new position.

April 4th was marked by considerable artillery activity, the



*Infantrymen are digging in, south of El Guettar. Most of the wire is in place, and at the extreme right it appears that a mine-field is being sown. Broad, flat, open valleys such as this one are ideal for tank maneuvering, but care is needed to avoid being pinned against the escarpment.*

BPth FA Bn again having a field day. During the day it destroyed five tanks, an ammunition dump, and several trucks. The MDth FA Bn fired on motor vehicles (starting several fires) and several times on tanks (dispersing them). The air patrol of the day consisted of eighteen P-51s who met no resistance. Air activity definitely had decreased, and remained that way for

the duration of the engagement.

By 0025 April 5, survey of the infantry lines was completed by the Div Arty survey team. Considerable enemy activity was reported to our own tanks. A concentration of about 75 enemy tanks was reported, and Corps requested fire of all units placed on it. No artillery observer was available to observe this target, and it was never verified that it existed. Results were not determined. Div Arty was prepared to fire on selected concentrations throughout the night to prevent a possible counterattack; no attack developed, and concentrations were not fired. As a whole the firing throughout the day was light.

On April 6th reports began to indicate the enemy was withdrawing. Firing was on a reduced scale. Enemy tanks and vehicles were reported as moving east toward Gabes. Our infantry began an advance on Hill 369, supported by artillery. The tank force also moved forward. Reports indicated that Hill 369 had been abandoned.

On April 7th all troops started to move forward. Little if any resistance was encountered. By 1200 Djebel Berda (Hill 772) was taken, and troops continued to advance. Hill Lettouchi was occupied and at 1518 the tanks were reported in rear of Hill 369; shortly after this Hill 369 fell and troops were



moving east. At 1705 they contacted the British 8th Army and the Battle of El Guettar was over. At 1730 the MDth FA Bn was ordered to move to concealed bivouac at Bou Chebka. Div Arty HQ and BPth and HNth FA Bns followed the morning of April 8.

During the Battle of El Guettar the units of the 9th Div Arty and attachments fired over 31,000 rounds of ammunition, not including the large quantities fired by the 1st Div Arty and the KMth FA Brig in their excellent support of the division upon the occasions requested.

Communications were excellent and cooperation among the artillery units was superb. All requests for fire of other units were instantly granted, regardless of who the observer was, and it is felt that this cooperation along with excellent communication facilities was one of the major features in the successful accomplishment of the mission.



*When this TD outfit paused near El Guettar it promptly posted sentinels so the other men could rest with an easy mind.*

## Local Security of a Battalion Position

By Lt. Col. Joseph R. Couch, FA

Every artillery battalion must provide for its own local security at all times. This is true regardless of attached, supported, or adjacent troops. Each commander down to and including the battery must consider his unit local security as his own personal problem and responsibility, and must utilize all means at his disposal to accomplish this end. There is no single solution to the problem of local protection, but a definite, practical plan must be established, planned to the last detail, and then strictly enforced.

This article is derived from actual experience in combat in the North African Campaign. My unit was a battalion of 155-mm howitzers, Corps Artillery. We modified Standard Operating Procedures laid down in Field Manual to fit the terrain and our own tactical situation.

### INTERIOR GUARD DUTY

First let us consider the problem of the Sentry (God bless him!). No soldier ever feels the blanket of night envelop him with the enemy a few thousand yards away without a few misgivings and a few prayers for the sentries. With enemy patrols active, and you must always expect them to be active, guard duty is not to be treated lightly.

Here is our system, usually required only during hours of darkness. Each battery establishes one perimeter guard about its guns and another about its truck park. The number of posts is variable, and each battery co-ordinates its guard with adjacent batteries if they are close together. A member of the battalion staff (usually the battalion executive) supervises and makes adjustments of sentries to cover vulnerable areas.

All posts are stationary, double posts. One man stands and challenges; the other hides himself about 15 to 25 yards away, keeps silent, and covers the man who challenges. These men relieve each other about once each half hour to maintain maximum alertness. Both men are relieved at the end of two hours, serving two hours on and four hours off as per normal garrison system.

All sentries must know the countersign and parole—and how to use them. Each man must be well grounded in his general orders and must appreciate the extreme importance of his duty.

I might add that American soldiers over here learned fast and were inclined to be quick on the trigger (too quick, sometimes). Several instances of being caught away from my area after nightfall and forgetting the countersign did not benefit my nerves in the least.

### ANTI-TANK DEFENSE

We had at our disposal for anti-tank defense, an AT platoon of six 37-mm guns and a plentiful supply of anti-tank rifle grenade launchers attached to M1903 rifles.

Realizing the limitations of the 37-mm gun as to range we made best use of its capabilities of being highly maneuverable and easily

hidden. We attempted in all cases to emplace the 37s at sufficient distance from the howitzer positions to effectively fire on an enemy tank before that tank should approach our position closely enough to fire on the howitzers or trucks. No set rule for this distance could be given—it might vary from 500 yards when our howitzers had good defilade to 1,000 yards when natural cover and defilade were poor. Obviously this method often endangered an anti-tank gun, but we felt that it was far better to do so than to endanger our basic weapons and transportation. Our AT gun crews were thoroughly drilled in the principles of concealment. They were taught to fire on tanks only at ranges below 400 yards and, if at all possible, to engage them in the flanks or rear.

The rifle grenade launchers were distributed among the sections. Slit trenches were dug close to the positions on the most likely avenues of tank approach. Men armed with the launcher were instructed as to which trench to occupy in case of tank attack. One of the weaknesses of this weapon is its lack of continuous fire. The grenadier is most vulnerable when he is reloading his weapon. To remedy this we designated rifle grenadiers to act in pairs. A soldier is more likely to stand his ground if he has a buddy close at hand, and the men can fire alternately, one reloading while the other fires.

### ANTI-AIRCRAFT DEFENSE

Ground units must be prepared to defend themselves from air attack with their own weapons at all times. They may not have antiaircraft units attached, and "Air Superiority" is transitory at best. Many times we were bombed a few minutes after a friendly fighter patrol had passed over.

For our defense against Stukas and Me's we had three means of defense: attached AA units (we learned to love them like brothers), .50-cal. machine guns, and rifles. All were very effective when used with skill and determination.

All men must be trained in aircraft identification.

The principles of "skeet shooting" as laid down in field manual are good, but constant drill and instruction are necessary.

Our .50-caliber machine guns were placed in a perimeter around the battery position, and were invariably dug in. In some cases we left them mounted in vehicles, emplacing the vehicle in a wadi or digging it in. Rifles were stacked near slit trenches and kept loaded. Each man had a designated slit trench and fired his rifle from there till the bombs could be seen in flight. Our machine gunners did not cease firing until the attacking planes were out of range.

"Jerry" has a healthy respect for our AA defenses and his bombing became progressively less accurate as the American forces gained experience in firing at aircraft.

# OBSERVATION

By  
Maj. Neil D. Cox, FA

Like positions, communications, or targets, observation is not a static thing. It must be sought aggressively, and exploited to the utmost. Methods used in North Africa by a divisional battalion of 155-mm howitzers illustrate one successful solution of this problem.

Although always in general support of a very wide sector, it habitually provided its own observation, thus relieving the strain on observation and communication facilities of the light battalions. The basic principles followed by its observers are outlined in its *Instructions for Observation Posts* (see below). Organization and general operations were usually about as in the action east of Sedjenane, where it had an 11-mile front in mountainous country.

There each battery formed an observation group consisting of the BC, RO, and Asst Ex; each officer had his own vehicle with 608 or 610 radio. Each group was assigned as its zone of observation (and advance of observation) the zone of action of an infantry regiment or other unit.

The BC got in touch with the commander of the unit in his zone, learned his plans for taking high points, and made his own plans to place an observer on high ground as soon as it was secured. His battery laid wire to his initial OP, where the BC took his post and set up his radio. The other battery observers (RO and Asst Ex) were then maneuvered by the BC to additional OPs to the front or flanks as they became available or advantageous. These observers communicated by radio either to FDC or to the BC, who relayed by wire or radio to FDC. Sometimes the battery executive's radio was removed from the gun position to be used for an additional relay station.

Gaps in the wide front were filled by two battalion observers (AT Officer and a LnO), who had both wire and radio communication to their OPs. These 11 observers furnished very effective observation throughout the battalion's 2400<sup>71</sup> sector of fire.

## HQ MDT FA BN INSTRUCTIONS FOR OBSERVATION POSTS

1. The following instructions for operation of OPs will be followed.

2. The following personnel and equipment are considered a minimum on OPs for best results in operations:

1 Officer	1 Victor Grid
1 NCO	1 Note Book
2 Privates (or PFCs)	1 Compass
2 Field Glasses	1 Radio w/extra batteries
1 BC 'Scope	1 Telephone
1 Protractor	1 Watch
1 Scale	Maps (to cover the entire sector of observation)
1 Pencil	

3. *a.* The NCO should be a qualified observer capable of relieving the officer observer at intervals for rest of eyes.

*b.* The two privates should be the telephone and radio operators. If only one means of communication is being used, one private can be used as a relief for the other and to service the OP wire, run errands, and dig slit trenches.

4. BC 'scope must be oriented, and so set up that the observer can sit in a comfortable position and observe without breaking defilade.

5. Maps must be oriented immediately on occupying an OP. Compass, 'scope, protractor, and scale are needed in most cases to orient maps properly, and to locate targets to the nearest coordinates. The second hand of the watch can be used in locating and getting the range of enemy batteries, by multiplying the speed of sound waves

(366 yds. per second) by the number of seconds between a gun's flash and the time the propelling charge is heard.

6. After locating an enemy battery by sound, continued and persistent observation in the suspected area will usually bring results.

7. Study the terrain and compare it with the map. Batteries in this country are usually near a road or trail as they cannot get into position far from the few trails that exist. Look for puffs of smoke or dust, as batteries will be behind defilade whenever possible. If movement is detected in an area, study it closely—there is something there.

8. Zones of observation are assigned. Take your zone and systematically search it. Divide it into zones, search each one in turn, and then repeat.

9. Panoramic sketches must be prepared on all OPs, showing predominant terrain features, base point, check points, and all concentrations fired. These should remain at OPs for use by reliefs.

10. Without a means of communication, both an OP and its personnel are useless. Pick the OP, immediately establish radio communication, then start wire. When wire comes in, the radio net may be closed. If the OP is used as a radio relay station for a forward observer (as is usually the case), an additional man should be sent to the OP. *Communication is vital.* It must be maintained at all times, and must take priority in the operation of any OP.

11. All OPs must provide dug-in protection for personnel. Splinter-proof shelters must be furnished whenever possible, for protection from time fire.

12. In relieving OP personnel a "time overlap" is necessary so that outgoing personnel can thoroughly familiarize the newcomers with the area, the action that is going on, previous action and concentrations, base point, check points, etc.

13. A forward observer must not be confused with an OP. Quite often a forward observer must travel lightly, taking only essentials of equipment and men. His minimum requirements are communications (radio, telephone, or both), personnel necessary to install and man the communications, map, scale, protractor, Victor Grid, field glasses, and pencil.

14. All activity must be reported (however small, and whether friendly or enemy), giving the essential elements of an intelligence message: What, Where, When, and How. Small observations tied together quite often make a big picture.

15. Study the enemy's terrain and the map. He will hide and place his batteries in much the same place you would use if you were on his side of the fence. Study areas and observe them persistently, and you will find the enemy.

16. Seek the high ground for OPs. When the infantry takes high ground that will provide a better OP, move to it.

17. In night operations in this type warfare, it is usually sufficient if one man is awake at all times. Before dark instruments must be oriented and a stake placed nearby for further orientation if necessary. OPs should fall back at night unless they are adequately protected by infantry.

18. Our enemy is usually most active at twilight, at dusk, and at noon. Observers should observe especially carefully at these times.

19. Before going out, all observers must check to see that all equipment is complete and serviceable. Radio must be checked repeatedly in the move to an OP. If radio fades, a relay set must be sent out so that communications will be continuous from the time an observer leaves his battery until he returns.

20. If supply from your battery is difficult, if possible attach yourself and personnel to the infantry for rations. This will save much time and effort in securing rations and water.

# Combat Conclusions

## COMMUNICATIONS

Double metallic lines were of course always laid from Bn CP to firing batteries. Bn laid the normal lines between switchboards, but the direct lines from battery executive to FDC were laid by battery agents, using DR-4s mounted on improvised reels on the agents' jeeps; note, however, that the mounting of additional equipment on jeeps has been prohibited, although it is possible that Ordnance methods of strengthening jeep bodies for this purpose may bring a relaxation in the future. Pairs of lines were laid over quite different routes, and plans were made to simplex either line promptly if the other went out. Lateral lines between battery switchboards were often used by Bn as an alternate means to reach firing batteries. For laying wire cross-country, a DR-4 mounted on a mule proved the best solution—mule-laid wire required little servicing, probably due to the little other traffic that followed or crossed its rugged trail.

At the CP was a device for throwing together any two or any combination of staff phones, for party calls. This was most helpful, as it avoided transferring telephones and moving from one phone to another in this widely dispersed installation.

Assistant Commo remained at the CP at all times, thus maintaining perfect coordination between tactical plans and communication agencies. He kept a tactical map on which he recorded all installations of his own battalion and of adjacent units, with the communications set-up of each. Accurate wire routes and radio nets were included.

Radio relay was found to be the rule, rather than the exception. Sometimes it was even necessary to remove the battery exec's radio from the gun position, for use as a relay station.

Two simple devices were especially valuable for obtaining radio security and reducing language over the air with a minimum of effort and without loss of time. One was a 14-word prearranged code, memorized by each officer while the battalion was still in training in the States; since there were no written copies, the code was never compromised and consequently never changed. The other was a template grid (which we called the Victor Grid) for sending map locations; only 7½" square, it is adapted to any map or grid and can be used for any area without prearranged plans or orientation; it is so convenient that officers prefer its use to normal coordinate location, when its use is permitted.

Continuous communication with the battalion rear echelon (S&A Btry) was found convenient and beneficial. Wire was laid, and often 608 radio communication was established. If these methods were not practicable or failed, 284 radio communication was automatically installed; since this had to be used frequently, a 284 was permanently attached to Serv Btry.

## CP OPERATIONS

# *of a Medium Battalion in Africa*

By Lt. Col. W. C. Westmoreland, FA

Being a tactical, administrative, and fire direction headquarters, a battalion CP has a tendency to become a "madhouse" at times. A few additions and variants will make the installation function smoothly, efficiently, and quietly.

Adding an ammunition recorder to keep a running record of ammunition and prepare ammunition reports, thereby relieving computers of this task, leads to considerably greater efficiency.

Installing a fourth staff phone, and a party-call switch (see above), helps a great deal. So does the continuous presence of a communications officer with an up-to-the-minute knowledge of the situation.

Each staff phone has an operator who keeps a record of all conversations over it; these records are used to check and complete the unit journal. The ammunition recorder operates the 5 (extra) phone, S-2 clerk the 2 phone; 3 and 6 phones have individual operators.

This S-2 clerk, not normally provided in the tables, is most helpful in cataloging maps, assisting in keeping the situation map up-to-date, and in keeping the S-2 log. S-2's map, incidentally, should show the sector and area of observation of each observer. S-2 himself remains at the CP and is given no outside duties. The Asst S-2 (Survey Officer) acts as RO.

The following system of handling fire missions worked well. When an observer requests a fire mission, S-2 checks it on his up-to-the-minute chart for safety of friendly troops (in case of doubt, he checks with HQ Div Arty). Simultaneously, HCO and VCO, supervised by S-3 or his assistant, plot the target and start reading data to the computer. S-2 either blocks the mission or gives S-3 a clearance. S-2 evaluates the target from an intelligence standpoint and transmits the information to Div Arty S-2 immediately, if such action is warranted. At the conclusion of the mission, S-2 reports to Div Arty the effect obtained on the target.

## GUNNERY

For a year this battalion taught and practiced the forward observation (air-ground) method of fire to the exclusion of all other methods. Through the North African operations no officer had occasion to use another method, as this one was rapid and effective and can be used for time fire. With it, a large percentage of NCOs have been taught to fire effectively. An additional computer at each battery executive's post makes it possible to decentralize and fire by individual battery acting alone.

Since a ladder can give away a battery's location, observers are trained to change just the range on the second round only when they are uncertain of the line of fire and want it materialized on the ground.

On one occasion, when the enemy was suspected of having a sound locating unit in the sector, each time a battery fired one gun from each of the other two batteries was fired arbitrarily

into enemy territory. Later reports proved that these rounds, although merely intended to confuse the sound locators, were very confusing and destructive to the enemy.

Experience of this battalion reaffirmed that a precision adjustment must be made on each piece of an enemy battery to damage the materiel to any degree. This of course can be done only if the pieces can be observed, which is usually the case with the 88-mm guns. Bracket fire will usually silence a battery, but it has very small chances of destroying materiel.

When sweeping reverse slopes, use delay fuze to get ricochet fire. If the adjustment is on the crest and then the range slightly increased, a good percentage of ricochets will result even with quite plunging fire.

German powder is not flashless like ours. In adjusting on enemy batteries, observers were often deceived by these flashes and adjusted a bit short. Unless ricochets can be obtained, overs on enemy batteries are more effective than shorts—they get in behind the shields, and also disrupt battery command installations. Be sure to use ample ammunition in the fire for effect.

#### FIRING BATTERY

Howitzers were always deployed on a wide front (200 to 600 yards). After laying parallel the executive formed a 200-yard sheaf at 5,000 yards, in the center of his sector. For prepared fires, the FDC computer formed this sheaf at the target's range. For observed fires, the observer adjusted the sheaf by giving *Sheaf wide* or *Sheaf narrow*.

Direct telephone communication between executive and each piece controlled the sections. Lateral lines between the pieces proved their worth when one or more direct wires to pieces were shot out; these laterals, usually defiladed, were seldom shot out. Additional insurance for continued communications is for each section to dig a slit trench halfway between its piece and the executive; a cannoneer can relay commands and still have protection.

After registration, the center battery recorded instrument direction by high burst. Each morning, and whenever weather conditions changed radically, instrument direction was checked and the base deflections of all batteries changed accordingly.

Training of all chiefs of section as executives was of great benefit in relieving battery executives during long periods of operation.

Guns were always dug in whenever possible. Slit trenches, widely dispersed, were always dug by each cannoneer. Value of this work was definitely proved. Several batteries received counterbattery and were bombed, but on no occasion was a piece damaged or a man injured. One battery received almost continuous counterbattery for an entire day, each wide-spread piece being adjusted on; result: battery was neutralized, no man was injured, one howitzer and one trailer suffered flat tires.

#### PROTECTIVE MEASURES

It was found that after an air attack or air raid, men should stay under cover for at least two minutes after the last AA firing—otherwise there was great possibility of getting hit by expended bullets or splinters.

This battalion standardized on a most effective slit trench. All trenches were individual, and dug widely dispersed. Standard trench was 2' wide, 3½' deep, and as long as a man was tall. Spoil was piled at the *ends* of the trench, and sodded or camouflaged; disposing spoil in this fashion had these advantages:

- a. There is greater security, due to increased protection against enfilade bullets or splinters.
- b. Covering less area, it is easier to sod or camouflage.
- c. The trench is harder to detect from the air, not having the familiar "bath-tub" appearance.
- d. With sides of the trench free of spoil, the men have more comfort during periods of inactivity.

#### DUDS = BOOBY TRAPS

By-products of artillery fire can be as deadly as deliberate booby-traps. They "get" the same type of individual, too—the careless and care-free, the forgetful, and the "wise-guy." Not, you notice, the ignorant, for there aren't any soldiers ignorant of this subject. All soldiers, and artillerymen in particular, are constantly cautioned and warned of the dangers lurking in the innocent-looking dud rusting peacefully on the range or battlefield.

Neither age nor type of a dud makes it safe to handle, or even to touch. Even the smallest will maim or kill the foolhardy who fusses with it; caliber only affects the danger zone—and since that is from 300 yards for the 37 to 800 yards for a 155, the bird who kicks, rolls, handles, or even touches a dud just isn't interested in reaching a ripe old age. Even an old, rusted shrapnel case may still hold enough black powder to kill a man.

Dud-busting is a dangerous and highly skilled job. Only three of Fort Sill's range detachment of 110 are permitted to deal with unexploded shells. They are highly trained in their specialty, and they take no chances because they know *there is no such thing as a safe dud*.



*Ft. Sill's dud-buster detail is here working on an unexploded 4.5" projectile. Without disturbing the dud, T/Sgt. J. R. Wise, left, has just placed two half-pound blocks of TNT on top of it and attached juzes. The plunger detonator beside him will be connected to the other end of the 600-yard reel of wire that Pfc. Nobic Gaddy is beginning to lay. On the right, Pfc. Noel Watson is starting to shovel at least 2' of carth on top of the dud and TNT. All three men will be a full 600 yards away when detonating the charge and dud.*

# GRASSHOPPERS

By Col. W. W. Ford, FA

Organic Field Artillery Air Observation has officially completed the first year of its life. On June 6, 1942, the War Department directed the establishment of this new facility. In the ensuing twelve months plans were made, personnel and equipment were assembled, and hundreds of pilots and mechanics were trained. "Grasshopper" aviation accompanied the first landing in North Africa and has since served continuously and in increasing numbers in that theater. From all accounts the service has been all that its enthusiasts predicted.

The present "grasshopper" weighs approximately 800 pounds empty, and about 1,200 pounds when loaded with crew and radio and full of fuel. It is a commercial product; many thousands like it have been used in civil aviation, and with only minor modifications it has been adapted to military use.

These little planes may be used for almost any sort of liaison work and for aerial adjustment of artillery fire. In the field artillery they serve chiefly as elevated OP's; their other uses are secondary. Each field artillery headquarters battery—whether battalion, division artillery, group, or brigade—is equipped organically with an air observation section. Each such section has two airplanes, two pilots, one mechanic, one truck with trailer, one truck driver, and a ground crew helper. An additional mechanic is assigned to the air observation sections of division artillery, brigade, and group headquarters batteries. Observers are not assigned organically to the air observation sections, but are drawn from the units to which these sections belong.

Practically all field maintenance of the airplanes is performed within the air observation section. Third echelon maintenance is a responsibility of the Army Air Forces base installations, but such maintenance is rarely necessary. A supply of spare parts is carried in the air observation sections of all headquarters batteries (except battalion) for issue to the battalions when needed. Installation of spare parts is easily within the capability of organic pilots and mechanics.

This little airplane is not a panacea for all the artilleryman's difficulties. It cannot bomb bridges, destroy tanks, nor prepare hot meals in the field. Its usefulness lies in its ability to adjust artillery fire and to perform such observation and reconnaissance missions as can be carried out while flying within friendly areas. The plane is not only unarmed and unarmored, but also painfully slow. It is exceedingly vulnerable to small arms fire from the ground and to the fire of hostile aircraft. To live in action it must be carefully concealed while on the ground. It must take the air for short periods only, and only when hostile aircraft are not around. It must fly at low



altitudes in order to minimize the chance of its being seen and to facilitate a prompt landing if an enemy appears. *It must not be flown over areas occupied by hostile troops.*

If these restrictions appear to reduce the utility of this little plane to the vanishing point, let it be said at once that while operating under such restricted conditions this plane can adjust artillery fire on targets 10,000 yards away. Adjustments have been made on targets up to 18,000 yards. The ability to do this is an asset of exceeding importance. Artillery fire increases in effectiveness and efficiency directly in proportion to the observation available. In many types of terrain the only practicable observation is air observation. This little plane can give that. By so doing it justifies its existence. Whatever else it gives is in the nature of excess profit.

Pilots and mechanics for organic field artillery air observation are trained at the Field Artillery School. Pilot training at Fort Sill is in the nature of advanced flying training, each pilot being required to have a minimum of 60 hours of flying time prior to entering the course. The flying training given at Sill is pointed toward sharpening the skill of the pilot in operating from miscellaneous small fields and from roads. Prepared landing fields are rarely used. This type of flying is inherently dangerous. It may be brought within tolerable safety limits only by careful and specialized training and by the use of discretion on part of all concerned. A high degree of flying skill is required.

Missions are invariably prearranged. This shortens the period the plane must stay in the air and thereby reduces its vulnerability.

A communication check is made prior to take-off. This again shortens the period in the air. By taking every short cut possible it is possible to reduce the average time for air adjustments to about 8 minutes, measured from take-off to landing.

Keep 'em hopping!

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"GRASSHOPPER" IT IS!

Organic field artillery 'planes have been saddled with a variety of nicknames of widely differing aptness. Far the most fitting is "grasshopper." Indeed, the special device of the Department of Air Training, Field Artillery School (where field artillery pilots are trained and where natural grasshoppers attain man-bearing proportions) is a grasshopper making a short landing. The term "grasshopper" is short, snappy, adaptable to improved planes of the future, and above all well suggests the type of work done by field artillery 'planes. So "grasshopper" it is, as far as we're concerned.



# AIR OPs IN TUNISIA CAMPAIGN

The Field Artillery Air OPs with American forces in northern Tunisia emphatically proved their value in combat. Skeptics before Tunisia are now crying, "Give us more—we can't get enough Air OP!"

There's a reason. A report on the northern Tunisian operations reads:

"Air OPs were very active during this operation and functioned effectively in their primary mission, namely, the adjustment of artillery fire, and were often able to get observation on targets not visible to ground observers. They were responsible for the successful neutralization or destruction of several enemy batteries which were not visible to ground observers."

Those who have fought for Air OPs, sometimes against discouraging odds, refrain from saying, "We told you so," but point instead to these impressive figures of results:

## MISSIONS OF AIR OPs IN NORTHERN TUNISIAN CAMPAIGN (23 April to 8 May 1943)

### a. Missions:

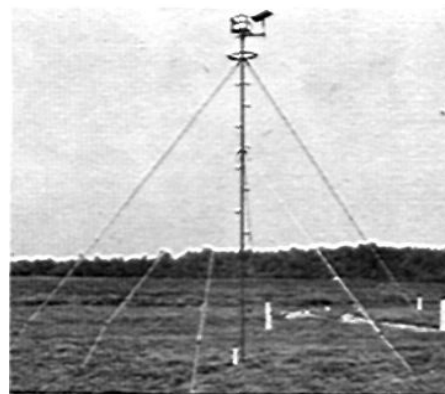
Type	1st Armd		1st Inf		9th Inf		34th Inf		CKth	FA	Vth Armd	Group	Total
	D.	D.	D.	D.	D.	D.							
Adj of Fire	26	14	4	14	30						9		97
*Adm	2	55	60	40	11						63		231
Recon	34	44	19	50	1						19		167
**Tactical	21	12	22	16	5						12		88
Unit Trng	0	24	0	80	23						5		132

Total missions 715

- b. Number of planes in operation.....31
- c. Planes permanently disabled..... 0
- d. Hours in air .....637:35
- e. Personnel lost on air missions..... 0
- f. Personnel injured on air missions ..... 1 pilot shot by enemy rifle fire  
\*Supply and courier missions.  
\*\*Column control and camouflage checks.

### GO CLIMB A TREE!

Henceforth artillerymen needn't take that order literally, as a 20-foot Observation Tower M1 is now in production. It is sectionalized for easy hauling, guyed against the breezes three ways at each of two levels, and fitted with a lordly throne complete with footrest and lectern. Simple, rugged, and easy to install, dismantle, and transport, it should be the answer in many bits of awkward terrain.



### NORTH AFRICAN JOTTINGS

Flying OPs are good, and we have used them with excellent results. Any losses—and they are very few—have been due to carelessness of pilots in their efforts to complete their jobs.

Stress time fire. It is marvelous, and the Germans and Italians have called it "inhumane." About time they got something like that!

Most people agree to trucks fairly close to gun positions, with machine gun mounts used as AA protection. Dispersion is more valuable than camouflage, although the latter is important.

Keep up Fire Direction work and follow the book. Nothing better.

—COL. R. D. SCHMIDT, FA

### OFFICIAL COMMENDATION!

"The almost unanimous comment of prisoners of war is that our artillery is terrible in its effect. This is a tribute to the existing methods of control and massing of fires.

"Again in this operation as in Gafsa and El Guettar it was felt that the American field artillery technique of massed fires was a major contributing factor toward the early and successful conclusion of the operation. The artillery communications, both tactical and fire control, were both worthy of mention. Only one of our field artillery pieces was effectively destroyed. This piece received a direct hit by a 500-pound bomb.

"The gunnery technique as outlined in our texts and employed by the field artillery units of this Corps has proven sound and effective in every encounter with the enemy."

—LT. GEN. OMAR BRADLEY (Commander of the U. S. Army II Corps in Tunisian finale)

# 155TH FIELD BATTERY AT BEJA

On February 26, 1943, at Sidi Nsir in Northern Tunisia, the 155th Field Battery R.A. fought one of the finest battles in the long and glorious history of the Royal Regiment. At a cost of virtually complete extinction the battery did the work entrusted to it.

Sidi Nsir lies in the hills 12 miles east of Hunt's Gap, near Beja. It was held by the 155th Battery and the Hampshires, another battalion of the regiment which distinguished itself at Tebourba. Their orders were to gain time. Time was vital if Beja was to be put in a state of effective defense, and Beja (the key to the northern Allied line) was threatened by a strong German force. With Beja in their hands the enemy would have made the Medjez-el-Bab salient untenable and transport to and from the Algerian ports extremely difficult. They did not get Beja. Intending to reach their objective by weight and numbers, the Germans attacked with infantry, guns, and tanks, including some PzKw VIs (the giant "Tigers") of the 10th Panzer Division.

On the evening of February 25th no signs of enemy movement were visible. The Divisional Commander, his Commander Royal Artillery, and the Commanding Officer of the Field Regiment to which 155 Battery belonged, spent two hours examining the countryside from a dominating OP, and could detect nothing ominous. But during the night Verey light signals began to go up in the hills around Sidi Nsir, and at 0630 next morning heavy mortar fire opened on the British guns.

After 45 minutes' shelling came a direct assault. German tanks drove down the road from Mateur. Four 25-pounders leapt into action, No. 1 (specially placed at the top of a slope to cover the Mateur approach) firing over open sights. Three tanks were hit as they attempted to pass through a minefield, and the road was blocked. Checked in their initial thrust, the enemy sent in lorried infantry who turned the battery's southern flank under cover of a hill.

Things began to look serious. The highest observation post, from which the whole countryside could be surveyed, was heavily attacked, its wireless transmitter was smashed, and its telephone lines were cut. Eight Messerschmitts swooped down on the guns and raked each in turn with machine gun and cannon fire, inflicting heavy casualties. This maneuver was repeated many times. Several vehicles on the road back to Hunt's Gap were wrecked and left burning, and the precious ammunition they carried had to be salvaged at imminent risk by the gunners. Bivouac shelters and dumps were in flames. Many men were wounded or killed. But the Commanding Officer of the Regiment, visiting the battery, found all ranks cheerful and determined. Their offensive spirit was completely undaunted. None of the wounded complained.

By midday 30 German tanks, with self-propelled guns and infantry in support, had worked round both flanks and were within 600 yards. A little later the enemy opened small arms fire at close range. At 3 o'clock strong detachments of infantry were across the road to the rear and no more ammunition could pass. For several hours every round had been manhandled forward under heavy fire.

The battery might have saved itself many losses had it concentrated throughout the fire of all its eight guns at a range of 1,200 to 2,000 yards, on the German tanks and artillery whose columns were cluttering the way up from Mateur. But its first duty was to protect the Hampshire companies by all means in its power, and it put first things first by concentrating in support of the infantry.

On every ground of military probability, the battle was almost over about 1530 hours. So at least the German Command reasoned. What was meant to be the death blow was struck by a column of tanks which raced along the road into the heart of the battery position. 13 other tanks gave covering fire with guns and machine guns from hull down positions. A PzKw VI led the attack; this was holed three times in the turret by shells from No. 1 gun of "F" Troop. A PzKw IV tried to pass round the wreckage, but it also was knocked out by No. 1. The same gun set on fire another tank. Then the surviving tanks drew back and shelled and machine gunned both "F" and "E" Troops, whose positions were easily spotted for they were now engaging the enemy over open sights. Hull down, the enemy tanks had a great advantage. Concentrating on one gun at a time they killed the detachments, smashed the guns, and set the remaining ammunition on fire.

When all seemed finished the Germans advanced again. But a surprise awaited them. In its dying gasp, the 155th Field Battery could still hit back. No. 1 gun of "F" Troop, whose crew had showed themselves heroes among heroes, destroyed the leading tank. A moment later a direct hit killed all the survivors; without a man left, No. 1 was silenced. Nos. 2, 3, and 4 fought on. One officer, batmen, cooks, all who could stand ran from gun to gun, serving each in turn. Although the issue was decided they fought out the day to the last man and the last round at ranges which shrank from 50 yards to 10 yards.

At 1730 hours the Germans, heavily mauled, moved on to crush "E" Troop as they had crushed "F." At nightfall one 25-pounder and several Bren guns were still engaging at ranges of from 10 to 20 yards, German tanks which were lumbering through the position, smothering the last resistance, swivelling round on their tracks and crushing in slit trenches.

A few minutes earlier the last message had come over the wireless: "Tanks are on us," followed by the single "V" tapped out in Morse.

At the guns and in the command posts and observation posts when the battle began were 9 officers and 121 other ranks. Nine survivors came out, of whom two were wounded.

The Germans did not reach Beja, Tunisia was not lost. Twelve weeks later the Axis armies in North Africa surrendered.

**Faithful, tenacious, effective—the 155th Field Battery of the 172nd Field Regiment was all these and more. Heedless of self, it accomplished its mission. In the July issue of the JOURNAL we published a brief account of this battery's final action. More information being available now, we are proud to present the details of this fine outfit's supreme test.**



# 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

## SICILIAN CAMPAIGN (July 10 to 22, 1943)

An invasion of Sicily was a logical step following the occupation of Tunisia, completed by May 15th. Preparations required nearly two months. The forces available to the Allies were those in North Africa, consisting of the British First and Eighth Armies and the U. S. II Corps. The latter was expanded by some new units, and the new command designated as the U. S. Seventh Army. The High Command added a Canadian Corps (of about 1½ divisions) which was in England. Certain French troops were available as a general reserve.

The plan was for the Americans (sailing from Bizerte and ports west thereof) to land with about 4 divisions on the south central coast of Sicily, and then advance inland to the general line Caltanissetta—Castrogiovanni—Enna. The British (sailing from Tunis, Malta, and ports south and east thereof) were to land with 3 divisions on the south end of the east coast (near Noto and Avola) and advance north along the coast with the mission of seizing in turn the good ports of Siracusa, Augusta, Catania, and Messina. The importance of these ports from the point of view of bases is just about in the order given, increasing from south to north. The Canadian forces (sailing

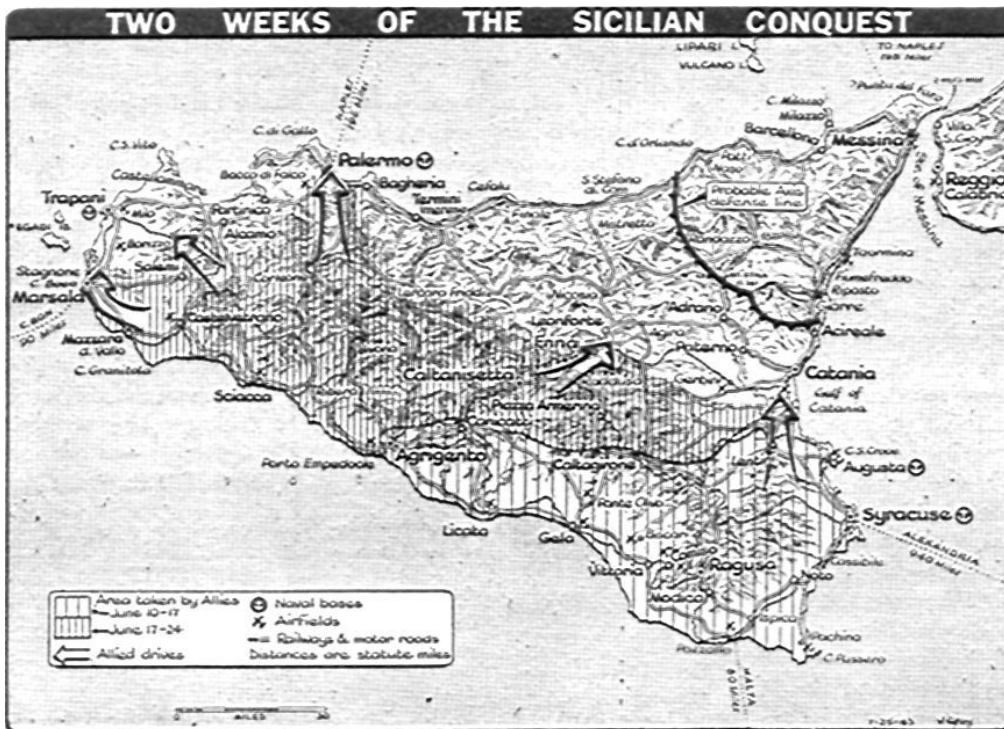
direct from England) were to land near Cape Passero at the southeast tip of Sicily, and establish and maintain contact between the Americans and British.

Two forces of airborne troops and parachutists, one British and one American and together equivalent in strength to about one division, were to land in enemy rear areas on the night of D—1 day and seize designated air fields, command posts, etc. A large naval force, mostly British but containing a substantial number of American ships, was to furnish artillery cover for the landing and initial ground operations. With this force were elements of the navies of India, Holland, Poland, and Greece. Very large air forces were provided to establish a complete umbrella over the landing areas; these were based on Malta and newly captured Pantelleria (for fighters) and on Tunisia and Tripolitania (for bombers).

Information of the enemy indicated that the entire island of Sicily had been prepared for defense. Towns, consisting almost entirely of stone buildings, were reported organized as centers of resistance. All beaches were reported protected by batteries, pill boxes, and wire. Roads were understood to be blocked by anti-tank obstacles. Strength of the defenders was stated to be come-where between 300,000 and 400,000 men.

The entire Allied expedition constituted a 15th Army Group, under the British General Sir Harold R. L. G. Alexander, previously commanding the 18th Army Group in north Africa. He served under the American General Dwight D. Eisenhower.

Latest advices show that the enemy's forces in Sicily were commanded by General Alfredo Guzzoni. This officer is 74 years old. He has been assistant Secretary of War and assistant chief of staff, and has a good reputation. The forces at his disposal





consisted of 3 Coast Divisions (204th, 206th and 207th) and 3 Infantry Divisions (4th, 26th and 54th); these were Italian troops. Then he had 2 German Panzer Divisions (the 15th and the Hermann Goering). The coast divisions were weak and without transportation; they were charged with manning the fixed coast defenses and watching the beaches. The regular divisions were in the rear areas, outside of the probable effective range of naval artillery. The German divisions were last reported in May as in Tunisia, and were there surrendered; they have been reconstituted, using elements of the Tunisian divisions evacuated to hospitals in Sicily, together with replacements and material which were en route to Tunisia when it fell.

July 10th was selected as D-day. In the early afternoon of July 9th the ships left Africa covered from enemy observation by the air force. A heavy wind and rough sea arose, this condition was reported to the High Command, who ordered the expedition to proceed. The wind later died down and did not materially interfere with the landing.

It did interfere with the parachute operations. These took off, with a view of landing at their destinations around 2100, July 9th. Due to the bad weather this did not succeed. Some of these troops were dropped from 30 to 50 miles from their objectives. Others landed nearer, but the men landed over a wide surface, being blown around the country. In only one case was the objective seized, and due to the small number of men who had assembled this could not be held. The men who had missed their objectives managed, however, to interfere considerably with the enemy's movements and communications by attacking whatever happened to be close by.

Landings occurred practically on schedule at all places. Transports arrived off the coast by 0100, at which time men were transferred to landing barges. There was a heavy swell and many men were seasick. At 0245 barges pulled off, and within a half hour troops were landing under cover of a strong naval artillery fire. The enemy's resistance was not effective, and it was rapidly overcome. When necessary, the navy on radio call shelled buildings, pill boxes, and other targets, and opened a way for troops. At 0600 it was possible to start debarking artillery, guns, and tanks onto the shore. During the day beach heads were secured. The enemy's air force was not very active, and its efforts were principally against the transports and naval ships.

In view of the situation the Italian commander ordered his 4th Division to attack the next day toward Gela, and his 54th Division toward Siracusa. Each division was given a detachment of the Hermann Goering Panzers.

On the morning of July 11th, the Americans at Gela held a beach head about 7 miles wide and 2½ miles deep. The beach was crowded with barges and men unloading materiel. About 0800 the Italian 4th Division, plus some 100 German tanks, attacked from all three sides. 11 batteries of American artillery were in rear of sand dunes which bordered the beach. Due to vegetation the enemy's attack could not at first be located, and the OPs were themselves soon overrun. The enemy made considerable progress. Only 3 American tanks were on shore, and one of these was unserviceable. Two went out to meet the enemy; so did some of the batteries. Severe fighting continued

all day. The attack from the north got within a half mile of the beach, where it was stopped by the direct fire of 105-mm guns. At this time the east attack made unexpected gains, sweeping along the beach. Part of the division headquarters staff grabbed rifles and turned out to stop it. The enemy was stopped. After dark, by moonlight, the Americans made an attack on their own and pushed the enemy back.

The British also had a fight on their hands, but pushed forward and by night were in Siracusa. With the Canadians, they held the line from Siracusa southwest to Pozzallo.

On the 12th the Americans advanced westward to Licata and the British northward to Augusta. The latter town had been evacuated. Next day the Canadians, who had so far met no special resistance, effected connection with the Americans. On the 14th an enemy attack by the 54th Division (plus tanks from the Hermann Goering Division) was launched toward Augusta. The enemy entered the city, but did not stay there. He only secured identifications and information. The Italian division commander was himself captured by the British.

Against increasing opposition the Americans pushed forward, and by evening of the 15th had reached the line Girgenti—Canicatti—Riesi—Niscredi (all inclusive). Canadians and British continued the line Biscari—Vizzini (both inclusive)—Lentini (exclusive).

In the next few days enemy resistance before the Americans declined. It has since developed that the Italian commander estimated the Allies as having 10 to 13 divisions ashore, supported along the coast by a powerful navy and in the air by substantially superior forces. He felt he was too weak to defend all of Sicily and decided to withdraw to the northeast tip, to the rear of the Simeto River, holding a line appropriate in length to the size of his command. He therefore held on his left against the British and yielded on his right before the Americans. He left his 26th Division to cover the movement by occupying central and west Sicily, aided by some local troops.

The British indeed found difficulty in advancing north from Lentini toward Catania. Attacks broke down. Parachute troops were dropped to gain bridgeheads. One detachment on the 15th captured the Primo Sola bridge (7 miles south of Catania) on the 15th, and held it until British troops fought their way forward and relieved them on the 17th. The Americans, overcoming Axis armor, captured Agrigento. To interfere with Axis reinforcements moving south the Allies heavily bombed the railroad net around Naples. The Allied bombing campaign was extended on the 19th to include the railroad yards and junctions at the edge of Rome.

During these days, the British made but little progress in their advance on Catania. The Canadians met some resistance, but advanced toward the upper Dittaino River. The Americans, meeting less and less resistance, pushed north and northwest. French Moroccan troops joined the American Seventh Army.

On July 20th the British Navy fired an artillery preparation lasting 8 hours, against indicated targets north of the Simeto River and up to 5 miles inland, to help the British Army advance toward Catania. Artillery OPs on shore radioed firing instructions; they reported the Navy's fire as accurate. The Air Force aided by bombing. The British infantry then attacked, but failed to make progress. British artillery did not

have sufficient ammunition, and probably not enough guns, to fire a preparation equivalent to what the Eighth Army had previously done in Egypt and Tunisia. Not having this aid, the infantry found it hard to advance. The British attack was renewed on the 21st and again failed. According to Axis reports 13 British tanks were lost.

On July 22nd the Americans entered Palermo, by an armored advance directly across the mountains which met only nominal resistance. At this date the Axis reported that all of west Sicily had been evacuated by their forces, but the extreme west portion had not yet been occupied by the Allies.

#### COMMENTS

1. The landing of the Allies on Sicily appears to have been a triumph of organization. The debarkation did not at first meet with much opposition. It then appeared against the Americans on the west and the British on the east, with relatively no opposition against the Canadians in the center.

2. The Axis decision (made about July 14th) to concentrate on the defense of the northeast tip of Sicily, resulted in the heavy fighting's being limited to that sector. In the following 10 days the

British made but a slight advance, despite hard fighting. The Canadians met increasing, and the Americans decreasing, resistance.

3. According to Axis statements some German reinforcements arrived in Sicily by July 21st. Assuming this is correct, it would indicate a determination to defend the northeast tip of Sicily to the bitter end. This country, which is dominated by Mt. Etna, is very favorable to defense, and if the Axis can keep their forces supplied it will force the Allies to maintain a considerable force of troops in Sicily and thereby delay further operations. This is probably the main Axis mission. It may be necessary to wait until sufficient large caliber artillery and ammunition can be assembled on Sicily before the Axis bridgehead can be reduced.

4. Axis reports claim that their air force have constantly attacked Allied shipping and have daily sunk and damaged vessels. Allied reports claim similar destruction to railroads in Italy. How much these operations interfered with operations is not yet known.

5. Allied appeals have been made by President Roosevelt and Prime Minister Churchill to the Italian people to disown their present government and surrender. The Italian government caused this appeal to be printed in all Italian newspapers, naturally with comments appropriate from its point of view. This would indicate some strength in the Italian government, which has announced a firm intention of continuing on with the war.

## WAR IN RUSSIA (June 22 to July 20, 1943)

During the latter part of June there were no active operations along the Russian front. Raids by both sides were frequent. Identifications were constantly made, so that each opponent had good information as to strength and distribution of the other's troops. Both Germans and Russians had their main forces in the center sector, where the front line was:

Sukhinichi (Axis)—Belev (Axis)—Mtsensk (Axis)—Novosil (Russia)—Malo Arkhangelsk (Russia)—Dmitriev (?)—Sevsk (Axis)—Rylsk (?)—Sumy (Axis)—Gotyna (Axis)—Belgorod (Axis)—Volchansk (Russia)—Chuguev (Axis).

This is a winding line, showing two pronounced salients: one in the north, centering around Orel (held by the Germans), and immediately adjacent to the south, another centering around Kursk (held by the Russians).

The Russians were very anxious to secure the Orel salient; in fact, they had previously made several unsuccessful attempts to do so. If they could take it up to the line Spas Demensk—Bryansk—Sevsk, their line would be shortened by over 150 miles and the trunk line railroad from Moscow through Orel to Kursk would be opened up. Similarly, if the Germans could reduce the Kursk salient, so as to bring the line from Novosil down through Tim to Belgorod, their line would be shortened by 120 miles and the important area around Kursk would pass to them.

Each side knew of the desire of the other to secure the other's salient. Each assembled troops to defend its own salient, and to have forces at hand should a favorable opportunity present itself to seize the enemy's salient. Each prepared appropriate plans, and in advance placed troops in suitable areas around the two salients, to attack one and to defend the other.

Nothing unusual occurred in this sector until 5 July. On the morning of this day, the Germans attacked northward from the vicinity of Belgorod. It was claimed that this was a local attack to secure a hill, to make a minor rectification in the line; whether this explanation is correct is not yet known. The Russians interpreted the attack as the commencement of an operation to reduce the Kursk salient. Certainly the location for

the attack was most suitable for this purpose. The Russian plan to meet such an event was to counterattack outward from the salient, with main pressure south toward Belgorod and north from Malo Arkhangelsk.

The Russian attacks started within a few hours. The south one made no progress, and the Germans secured the hill they were after. The north attack seems to have caught the Germans unprepared, for the Russian attack broke through. During the afternoon the Germans counterattacked, stopped the Russians, and partly recovered their lost ground. The Russians claim that this result was secured only by excessive tank losses by the enemy, amounting to nearly 600—which is just four times the number of Russian tanks reported as casualties by the Germans.

In view of this situation the German High Command decided to reduce the Kursk salient by two main attacks practically astride the north-south railroad through Kursk. The plan was to punch holes through the Russian lines by an artillery preparation, following which armored divisions would dash through into the enemy rear areas to attack the main line of resistance from the rear while infantry divisions attacked from the front. Nine armored divisions were available near Belgorod, five armored and one motorized divisions near Malo Arkhangelsk. About seven infantry divisions were in support for each attack.

Early on 6 July the German artillery, aided by the Air Force, started a preparation; this was limited to narrow fronts about 2 miles wide, along which devastating shell fire and heavy bombing sought to smash a way open. The armored divisions then dashed forward under cover of protective artillery fire on their flanks and overhead air cover. On the south they went deep into the enemy's rear areas before they stopped and turned around. Then they waited until morning. German infantry did not follow their armor; Russian reports state they couldn't. The north German attack made only a slight progress, and the armored divisions did not get far into the Russian defenses. On this day the Germans are reported



as having lost 433 tanks, which was about 1/3 of the Russian loss.

On the morning of the 7th the German armored divisions which had broken through were assailed on all sides by Russian armor. A gigantic tank battle lasted all day. The respective air forces intervened for direct combat aid and for general reconnaissance. The general area of this furious battle was 25 miles north of Belgorod, but the battle extended over a wide area. It continued on into the night and all of the next day. Tank casualties were large on both sides. The general result was to leave the Germans in possession of the field, the Russians retreating. According to reports of the opposite sides, during these first four days the Russians lost 1,227 tanks and the Germans 1,539.

Meanwhile the infantry divisions were fighting it out. The Germans in the north advanced their line to include Malo Arkhangelsk, and made some slight advances in the south. A German attack northeast of Orel pushed beyond Mtsensk. This appears to have been a reconnaissance in force, for the local success was not exploited.

On the 9th the German High Command discontinued the north attack. Activity in this sector was limited to lively artillery fires, and raids. The attack in the south was pushed. Infantry divisions attacked the Russians from the south, while a part of the armor attacked them from the rear. The remainder of the German armor watched the Russian armor, withdrawn to cover Kursk, which was the center of the salient, an important depot, and the junction of all main roads and railroads. The German attack made considerable gains. Both sides brought forward fresh divisions to replace exhausted ones in line.

Rain set in on the 10th, materially interfering with the air forces and hampering the movements of motorized vehicles across country. The German attack was pushed and again made gains; the Germans were obviously striving to encircle Russian forces north of Belgorod. With German armor tearing around in rear areas, the Russian situation in this sector was not good.

The Russian High Command decided to relieve the enemy pressure by starting the already-prepared plan for capturing the Orel salient. Before engaging on this too seriously, orders were issued to make limited attacks north and east of Orel, to secure complete identifications and determine just what might be done.

On 11 July the German encircling movements north of Belgorod began to produce results. Many Russians were rounded up, the number of prisoners taken being reported as 28,000, including some captured previously. Much booty was captured. The Russian reconnaissance attacks north and east of Orel, which were continued on the following day, made no gains, but they secured the information desired. On the 12th, two Russian armored divisions were withdrawn from the vicinity of Kursk and sent south to rescue the infantry divisions, which were struggling against the Germans moving north from Belgorod and now about 28 miles from it. These divisions appear to have been discovered advancing by the enemy's air force. When they made their attack they received heavy artillery fire, a violent bombing, and a coordinated assault by German armor. They were driven back after having lost about 400 tanks, as against a claimed German loss of only 63 tanks. The weather was still rainy, and interfering with both armor and air forces. The German armor on the south was now acting in close liaison with the infantry, and not venturing far away from support.

On 13 July the Russian High Command, having ascertained that the conditions within the Orel sector were favorable, launched their attack. The north attack had a front of 40 kms between Sukhinichi and Belev; its axis of advance was SSW. The east attack, on a front of 30 kms, was between Mtsensk and Novosil, its axis SW. This sector is largely swamps and dense woods, unsuitable for armored troops in masses. The large number of stone villages were all occupied and prepared for defense by the enemy. There was no regular connected

line on either side. The Russians outnumbered the Germans, but found it necessary to reduce every village by artillery fire, slowing the advance; but they made progress from the beginning. Near Belgorod the Germans continued to make gains.

During the 14th and 15th the Germans continued their attack north of Belgorod, made gains, and scooped in quite a number of prisoners and booty. At the same time the Russian attacks around Orel made progress. They did not make any great captures, but steadily drove the Germans back. The north attack in places had advanced 25 miles, the east attack 13.

On 16 July the Germans discontinued the attack north of Belgorod, the primary Russian objective. But they kept right on with the Orel operation. German reserves had now arrived and made incessant counterattacks. The Russian High Command, seeing the success their offensive was obtaining, now decided to extend it further. They directed the following further offensives:

1. South of Leningrad, on a 75-mile front, westward from Volkovo.
2. Between Velizh and Demidov, on a 40-mile front, headed toward Vitebsk.
3. In the vicinity of Voroshilovgrad, on a 50-mile front, headed southwest.

These three new attacks started on 17 July. As this article closes none had yet made any especial success, but on 20 July the Orel advance was continuing, with rate reduced to 4 kms per day—indicating strong resistance. In the four attacks together, the forces engaged exceed in numbers and strength any previously employed on this front.

## COMMENTS

1. Neither side in this great contest publishes its own losses or its own strengths. Both sides publish regularly the tank losses of the opposing side. At the moment this is the only statistic available for the two combatants. These are far from being certainly accurate. Taken for what they may be worth, in the Orel and Kursk salients they show the following.

In the first four days of battle, which included the great tank battle of 7 and 8 July, the Germans lost 1,539 tanks and the Russians 1,227. This is in the proportion of 5 to 4, during which hard fighting occurred. It would seem to indicate that the Russian armor was superior. However, the Germans were the assailants and so should expect larger losses.

In the next four days, from 9 to 12 July, after the Russians had withdrawn their main armor, the tank losses were 211 for the Germans and 813 for the Russians. This was the period of German exploitation, and includes capture of encircled forces.

For the next six days, (from 13 to 18 July), during which the Belgorod operation was dying out and the Orel operation started, the tank losses are not available separately. For both they are 834 German tanks lost, as against 2,269 Russian. The Russian offensive was comparatively much more costly in tanks than the German offensive, being in the proportion of 2.7 to 1, or twice the rate for the German offensive.

2. In reporting the capture of 28,000 prisoners the Germans also reported capturing 2,310 guns. The two items together might indicate that about 10 Russian divisions had been badly mauled.

The German gun losses reported by the Russians relate almost altogether to a few self-propelled guns, and presumably includes those captured and put out of action by artillery fire.

3. German casualties reported by the Russians add up to 2,100 prisoners for the entire period. To include the 18th, German killed are summed up as over 60,000. The daily reports add up to about 65,000. The statement as to prisoners is probably accurate, but Russian estimates of German killed are doubtful. As the battlefield around Belgorod fell into the enemy's possession, the Russian figures for this sector are probably a guess.

4. At date of writing this battle appears to be spreading. Better conclusions will be available later.

## WAR AGAINST JAPAN (June 22 to July 20, 1943)

### THE SOUTH PACIFIC

United States activities in the south Pacific are divided between two authorities, one Army (under General Douglas MacArthur, with headquarters in Australia) and the other Navy (under Vice Admiral Halsey, with headquarters at sea). The boundary between the two commands used to be the meridian of 160° East Longitude. As this ran right through Guadalcanal, a year ago when operations against that place were about to

start, the boundary was moved west 2° in this part of the Pacific, thereby placing all of Guadalcanal within the Navy's area.

This year it was decided to start a new operation within the Solomon Islands group by attacking the Japanese base on New Georgia Island, about 180 miles northwest from Guadalcanal, and again on the boundary between the two commands. This time the boundary was suspended and the contemplated operations placed under General MacArthur's control.

Serious preparations were started during May. Troops on Guadalcanal were specially trained for an amphibious expedition, and were equipped with the latest spotted green and yellow jungle uniforms. They were issued the latest models of weapons, but were not told the objective of the expedition which all could see was being prepared. The enemy also noted the accumulation of troops and of transports at Guadalcanal, observed that place closely, and once in a while dropped a few bombs at night, causing occasional slight damage and a few casualties.

The information as to the Japanese forces on New Georgia



*Vila Airfield on Kolombangara Island, like many Jap installations, is backed out of the jungle. Only the planes themselves are hidden; they are placed in rings of revetments surrounding the runway. At the upper right is Kula Gulf, scene of our July naval triumphs; the channel below is Blackett Strait.*

indicated that their main base and air field were at Munda, with a secondary base at Viru Harbor. Both of these are on the west coast, which extends northwest and southeast, Munda being at the north end and Viru near the south end. The enemy was believed to be two divisions strong—part of the Japanese Seventeenth Army, whose CP was at Rabaul, New Britain Island. Both Jap divisions were concentrated near Munda, with detachments out in all directions (including Viru) as outposts.

South of Munda, separated from it by a strait only 5 miles wide but full of reefs and rocks, was Rendova Island. This is about 20 miles long from north to south but not over 10 miles wide. It is a volcano, supposedly extinct, nearly 3,500 feet high, and densely covered with woods and jungle. The enemy was known to have an outpost on Rendova.

The plan of attack was to land the main force on Rendova and later transfer it across the strait to New Georgia, whence an attack would be made against Munda. A secondary attack was to be made against Viru Harbor. June 30 was selected as D-day for landing on Rendova and at Viru.

In preparation for the latter landing a detachment of about 100 Marines landed on the night of June 20 12 airline miles east of Viru Harbor, 18 miles away by trail. The Japs failed to notice this movement. These Marines had orders to remain concealed until the proper time, and then attack Viru from the rear simultaneously with the expected arrival of transports on D-day.

On D-day, before dawn, the main expeditionary force (having sailed during the preceding afternoon) appeared off Rendova. Earlier Navy destroyers landed on islets between Munda and Rendova small forces of men equipped with light guns, lest the enemy attempt to cross over from Munda. Nothing of this kind happened, however.

The small force of Japs on Rendova failed to discover the expedition until barges were almost at the shore. They then opened fire, but were rapidly overcome. Within a few minutes troops in great numbers were landing, and soon thereafter—with extraordinary speed—artillery, transportation, and stores followed. So fast was this work done that the transports



*Navy dive-bombers on the "milk run" have been softening up Munda Point's airfield for some time. Because of surrounding revetments for planes, bombs blasted a considerable area in addition to the runway itself.*

completed their unloading by 1400. During the morning the naval ships repeatedly shelled Munda, and the air force bombed it. By afternoon, division artillery opened fire across the strait on Munda. The enemy's artillery was silenced.

After midday the enemy reacted. A strong hostile air force appeared over Rendova, and a great air battle with our protecting air cover followed. One hundred and one Jap planes were reported as downed, as against a loss of 17 U. S. planes. Notwithstanding this defeat, a new Jap air attack was made later against the transports and their escort, now steaming away to their base. At 1530 an estimated 110 Jap torpedo planes and dive bombers attacked the transports in waves for nearly an hour. The convoy was reported as suffering no material damage, but as having shot down 65 enemy planes. At this date it seems probable that these 65 enemy planes are included in the 101 reported downed above.

The attack on Viru Harbor, due to occur this day, was postponed 24 hours by reason of the fact that the Marine detachment already landed was not in position. They had been located by the enemy after they advanced, and were delayed by minor fights. They arrived at noon, July 1, and attacked Viru. They estimated the enemy strength as 100 men. By 1315 Viru had been taken, the enemy withdrawing toward Munda. Troops





*As most South Seas islands are actually mountain tops, the old ridges result in many surrounding islets. Here is Ring Dove Harbor on the north shore of Vangunu Island. Australian dispatches of July 5th indicate U. S. troops have seized Vura village (on the southeast coast) from the Japs.*

debarked from later transports without opposition.

These preliminary steps having been taken, main landings on New Georgia Island were made on the night 4/5 July. One force landed without opposition at Zanana (6 miles east of Munda) and another at Rice Anchorage (4 miles northeast of Bairoko Harbor). The latter place is north of Munda, 10 miles away across rough territory. No enemy was found here.

On the next night, 5/6 July, the first of two night engagements occurred in Kula Gulf, which separates New Georgia from Kolombangara Island, held by the enemy and having air fields. Our light naval forces appear to have discovered the enemy's ships by radar, without having seen them, and then to have opened fire on them at a range of several miles. Within 5 minutes 4 or 5 enemy destroyers were reported burning or sinking, and within the next 15 minutes 3 or 4 enemy cruisers. Our light cruiser *Helena* was badly damaged, and sank later. In addition to the foregoing enemy losses 2 more ships were reported sunk later while attempting to flee northward.

The second engagement in Kula Gulf was similar to the first, and occurred on the night 12/13 July. This time the enemy is reported to have lost 1 light cruiser and 3 destroyers, besides some small non-combat vessels. We lost the destroyer *Gwin*. Japanese accounts of these two battles do not admit the loss of any of their ships, but do state that one heavy cruiser of theirs was very badly damaged. Our naval reports do not identify a Jap heavy cruiser, but at night it might easily have been mistaken for a light cruiser.

A third engagement with enemy ships occurred on the night 17/18 July, off Kahili, on Bougainville Island, roughly 200 miles northwest of Munda. In this case our attack was entirely by air, and lasted for 9 hours. The airdrome was attacked first, and then shipping at anchor. One enemy light cruiser and two destroyers are reported as sunk, and some small vessels sunk or burned. Enemy planes who endeavored to protect their ground and sea forces were driven off with the loss of 49 planes, as against 6 of our planes.

Besides the serious air losses of the Japs on the occasions mentioned, there have been almost daily air flights in all of which the Japanese are reported as regularly losing in rather fantastic numbers. It is not quite clear how they manage to return so often.

Commencing on July 9th the troops landed on opposite sides of Munda began to advance. Those at Bairoko first undertook a minor expedition against an enemy post at Enogai Inlet, 2 miles away to the northeast. The enemy, reported as 150 strong, were annihilated. This cleared away the outposts and brought our troops in contact with the enemy's main body.

Very strong enemy resistance has since been met. Up to July 20 this had not been overcome, despite considerable assistance from the Navy (which shelled the enemy from the sea) and from the air forces (which bombed them heavily day and night). As Munda is practically surrounded and its air field under fire of our artillery, it seems to be well under way to being overcome.

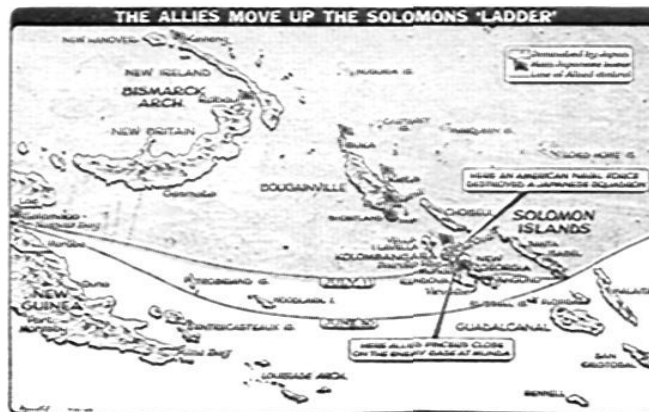
#### NEW GUINEA

On June 30th, same day as the landing at Rendova, American forces landed before dawn at Nassau Bay, on the north coast of New Guinea in the Salamaua area, and on the Trobriand and Woodlark Islands. The islands are about 120 miles off the southeast end of New Guinea, in the direction of the large enemy base at Rabaul. They were not occupied by the Japs. The reason for taking them seems to be to construct air fields from which an attack toward Rabaul can later be better conducted.

Neither was the landing at Nassau Bay opposed, but the advance inland from there was. Overcoming this, the Americans on July 10th effected a junction at Binggap Creek with Australian troops, who then jointly attacked the enemy covering Mubo on Observation and Green Hills. Observation Hill had been bombed by us on the 7th, 106 tons having been dropped within 45 minutes. Our communique reported that immediately after this our ground troops occupied the hill. Thereafter the enemy was reported on the 10th as still on this hill, but surrounded. On the 15th his defenses on the hill were reported destroyed, without claim that they had been occupied. Our forces have advanced, however, and have passed Mubo on the way to Salamaua.

#### COMMENTS

1. The operations described above appear to commit our present strategical plan to a step-by-step advance. Present moves are obviously



toward Rabaul. The plan may be changed at any time, however, if developments elsewhere warrant doing so.

2. The Japanese, in view of our great air strength, have undertaken to supply their troops on south Pacific Islands partly by barge and partly by submarines. These barges are 50 to 70 feet long, the majority being of the smaller type. They are similar to the barges which our Quartermaster Corps operated in the Philippines, except that the present Jap barges are self-propelled. They carry a crew of 7 men. This kind of barge is very seaworthy. I once lost six of them in a typhoon between Hong Kong and Manila (they were empty); after the underwriters had paid the insurance and a contract had been let for new ones, the six lost ones were found far away in the China Sea; except that they were upside down and needed a little repainting, they were as good as new.

These barges can navigate shallow waters. In the tropics, they can be drawn by day close to shore and camouflaged with adjoining vegetation. At night they are not visible to a plane at a high altitude. A 50-ft. barge will carry 70 passengers or about 20 animals. One barge

will carry 5,000 Jap rations or the materiel for a light battery. Four or five barges a day will keep a Jap division in Class 1 supplies.

The Jap submarines used for supply purposes are of 400-ton and 1,000-ton sizes. The smaller carries about 40 tons of freight and the larger as much as 400 tons, partly lashed to decks. They carry no armament. This type of vessel is really a submersible barge, and is used close to the front—particularly to supply Jap posts near Salamaua and Lae.

#### BURMA AND THE NORTH PACIFIC

Operations have been limited on account of the prevailing rainy season. Allied air forces are bombing over Burma, giving special attention to destroying railroads, bridges, water transportation on rivers and coast, and commercial plants. There has been no corresponding enemy air activity. Operations in the north Pacific have been limited to frequent bombings of Kiska by American and Canadian air forces.

## MECHANICS FOR COORDINATION

For varying periods, numerous American artillery units have already been under varying degrees of British control. For particular operations some have practically been incorporated into larger British units, and mixed organizations will doubtless become more frequent as the continental invasion gets under way. Many problems of technique, coordination, and control are bound to arise. We are therefore glad to be able to present the following extract from a British document covering some of these points; this was actually used in North Africa but has not yet been issued as an official publication. Careful perusal will help you understand British organizations and abbreviations, as well as technique. For explanation of abbreviations, consult your British friends or the JOURNAL for last September or February.

### COOPERATION BETWEEN BRITISH AND AMERICAN ARTILLERY UNITS, WHEN FIRING REGT OR DIV CONCENTRATIONS

1. Where fire is required from American Arty as part of a Regt or Div concentration, it is best obtained (a) by allowing their Bty Comds to register their own guns, or (b) by calling to the Control OP an American Liaison Officer with a wireless set on his Bn frequency with which to shoot the Bn.

2. Where this is not possible, British Officers controlling the fire will always adhere to the following:

(a) The order "British method" will always precede the target, etc. (to indicate to American units that they will be given "corrections" as opposed to "observations" for each fall of shot).

(b) Targets will always be indicated by map reference and a brief description.

(c) The number of guns will be ordered by the control OP using the following terms:

Troop	}	Target	4 guns.
Bn			
Regt	}	Target	All guns available.
Div			

(d) Corrections to range will be ordered as "add" and "drop" (e. g., "Add 400," "Drop 200"). This is a correction in yards and it will be changed to T.E.\* in mils by the FDC, Bty Comd, or Bty Executive (G.P.O.), as the case may be.

\* Tangent Elevation.

(e) Corrections to line will be given in the form "right . . ." (yds) and "left . . ." (yds), as "Right 500," "Left 200." The FDC, Bty Comd, or Bty Executive will also change this to mils for the guns.

3. A glossary of British and American gunnery terms has been issued to all units. Officers must be prepared to help in using these terms if they are shooting *ONLY* American guns. Where guns of both nations are employed, all orders will be given in British form and as shown in sub-*paras* "a" to "e" above.

4. The chain of control of American Arty is as follows:

(a) When the Bn is deployed, control is exercised by the *Fire Direction Center (FDC)*. Observations sent by an OP are there converted to mils both for line and T.E., and passed to the guns. The FDC also decides whether the targets are to be engaged, the number of guns to be used, and the amount of amm to be expended. That is, with the American Arty, control comes from the rear and not from the front as is normal under British methods.

(b) Where the FDC is not operating, control is exercised by the BC at the OP. He, as opposed to the GPO (Bty Executive) has the bulk of the technical staff and instruments with him at the OP. He, therefore, and *not* the GPO, carries out the necessary conversions and passes the data for firing to the guns.

(c) In view of this it would seem advisable for British and American OPs (as opposed to their gun posns) to be linked by line, if this is at all practicable. This would obviate the passage of orders *up* the American OP line for conversion before being sent back to the guns. It will also be of great value in passing messages to the FDC since, owing to the differences in wave bands of American and British wireless sets, no wireless comm between sets issued to American Arty units and those issued to British units is possible, with the single exception of one set held at Bn HQ as the rear link set for comm to the C.R.A.

5. Fire for effect will be ordered as "Fire for Effect for X mins; Rate . . .," or "Fire for Effect from 1930 hrs to 1935 hrs; Rate . . ." The American practice is to fire gunfire at all times, no standard rates of fire as understood by the British (as intense, rapid, etc.) being used.

6. American Arty normally fires HE with a fuze which can be set to "Super Quick" or "Delay," and the type to be used will be decided by the American BC or FDC, according to the description of the target in each case. A timed HE fuze is also used, but this will not be employed by British Officers.

### BRACKET YOUR TARGET!

"The king is dead"—and may he be forgotten quickly! That hybrid sensing of "range approximately correct" has been abolished. Definite brackets must be obtained. Artillerymen are now back on the firm footing of basic mathematical principles.

# IT MIGHT HAVE BEEN YOU

By Maj. W. A. Hadfield, FA

The Judge Advocate cleared his throat and looked solemnly over his spectacles at Lt. Derrill Clearwater with an eye as cold and gray as a salmon.

"I will now arraign the accused," he droned; "Charge: Violation of the 96th Article of War. Specification: In that 2nd Lt. Derrill Clearwater, —th FA Bn., did at Yakima, Washington, on or about November 17, 1942, through neglect and careless computation, suffer the fire of his battery to fall upon a hill crowded with personnel. How do you plead to the specification?"

Lt. Clearwater licked the dry roof of his mouth; a hot flash passed up his spine. "I couldn't see my guns; I had no map; I thought I was on Hill 2520 . . ."

"The accused will plead to the issue!" growled the President of the Court.

Clearwater squirmed in his chair; the faces of the court members faded before his eyes. What was that noise? It sounded like an alarm clock. The table was still there, but the court members' heads were just hats on a shelf; the court walls were canvas! It was an alarm clock! First call was blowing! Clearwater leaped out of bed with a hoarse cry of joy, "It was a dream!"

But the nightmare could well have been a real scene. For today, he remembered, was the day of the AGF Test. He was to be a forward observer and register his battery on the base point.

Clearwater had just been assigned to this battalion. He had been told the CO was a tough egg who wanted results, and the man who didn't produce was on the CO's black list for good.

After mess the battalion moved out to the designated rendezvous area. The officers assembled as ordered. After targets and base point had been identified the battalion CO told the assembled officers, "I want that first round close. Your initial data must be accurate as you will be graded for time, and if your initial data is much in error the time consumed in getting on the base point will give you a 'U.'"

On his way forward Clearwater thought of all the ways he had been taught to compute initial data and factors. He knew how to obtain the measured angle; how to compute offsets; how to determine the firing angle. He was sure he couldn't go wrong.

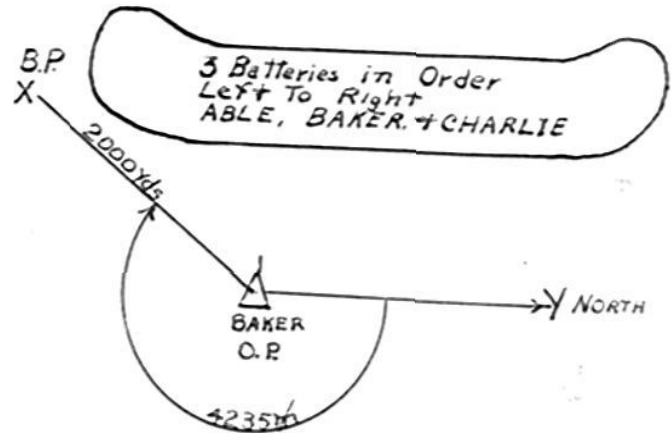
When he reached his OP he identified the base point and then turned around to locate his guns. He couldn't find his guns, he couldn't see trucks, he couldn't see any other battery, he couldn't see anything except rolling terrain and sage brush.

This new outfit of his had sure been trained in concealment and camouflage! How was he going to compute data and factors if he couldn't get his measured angle and ranges? They'd never taught him that at school! He could see his name going into the CO's black book now. What a hell of a way to start with a new outfit!

However, being a smart soldier he sat down and jotted down the information he did have. Then he measured an angle, made more notes, drew Sketch 1, and this is what he had:

- a. Order of registration: Able, Baker, Charlie.

- b. General direction of fire: west.
- c. Order of gun positions from south to north: Able, Baker, Charlie.
- d. Measured compass to base point from Baker OP: 4235.
- e. Estimated range from Baker OP to base point: 2,000 yds.



SKETCH 1

After studying the above for a short time he arrived at a 100% solution. Here is what he did:

- a. Requested FDC to give him Able battery's adjusted data as soon as it had registered.

- b. Requested Baker's Executive Officer to pace off the distance Baker battery was north of Able battery.

FDC reported:

- a. Adjusted compass Able battery: 4954.
- b. Adjusted range Able battery on base point: 6,000 yds.

Baker's Ex. O. reported that Baker battery was 600 yds. north of Able battery.

From the above information Lt. Clearwater got the following accurate data (see also Sketch 2):

- a. Initial compass for Baker guns: 4954 —  $(600/6) = 4854$  or 4850.

- b. Baker OP is north of Baker GT line.

- c. Facing base point at Baker OP, Baker guns are to left rear.

- d. Target offset on base point from Baker OP for Baker guns, is 4850—4235 or 615 ft.

- e.  $s$  is  $\frac{1/10 \times 615}{6}$  or 10.

- f.  $d$  is  $\frac{1/10 \times 615}{2}$  or 31.

Lt. Clearwater then consulted his range table and obtained elevation for 6,000 yards and correct  $c$  for this elevation. He





# KILLED: 127 BUGS WITH ONE ROUND

By Capt. Mike Rinehart, FA

Loading Plan! You stare at the memorandum from the battalion commander and remember that you have submitted at least six loading plans for prime movers in the past year. Each one, you thought, was about the last word in loading



*The finished load is neat, with all equipment loaded in an orderly and convenient manner. Gun crew rides with an astonishing degree of comfort.*

efficiency—but each time you have submitted your suggestion, there were plenty of bugs in it. You visualize the 4-ton prime mover that pulls the 155-mm howitzer, and wish that it was a 50-foot flat car. Then *perhaps* you could get all the equipment on and still have a place for the gun crews to ride.

You read all the training literature you can find. You check your notes from B.O.C. days at Fort Sill. You try to picture yourself as an enlisted man who has to use the equipment loaded on the truck, and then ride pinched up with nine others on a 20-mile black-out march. Then an idea clicks!

You call in the section chiefs.

"We have to submit another loading plan for our PMs," you tell them. "All the others have had enough bugs in them to eat up all the victory gardens in Texas. You and your men have to ride in the trucks, unload the equipment, and get ready for action. I want you to submit me a loading plan. I want one that will be convenient, look neat as a French maid, and have the comforts of a Pullman. The best I can figure is that you have 127 items, including yourselves, to put in the truck. That is 127 bugs to kill with one round."

They sigh. You notice a couple of them involuntarily snatch at their stripes. But they just salute and retire. Later you see them in the motor park huddled around a PM. And with them are all the members of the gun crews.

That afternoon the chief of detail makes an unusual request. He wants, of all things, to borrow from the ordnance 36 rounds of live ammunition. He also wants you to arrange for the camp photographer to be on hand at four o'clock the next afternoon.

Ordnance does not want to cooperate on the loan of ammunition, but S-3 will. He schedules a fake service practice and the 36 rounds are drawn on a transportation order. Later it will be turned in without a round being fired.

Next afternoon your chief of detail informs you that your presence is desired in the gun park at 1600. You believe in the

boys who run the gun crews, so you invite the battalion commander and the staff to come along. You hope the boys will pull a rabbit out of the hat.

Your hopes rise when you see what they have concocted. The load *is* as neat as a French maid, and 10 men with full field equipment are seated in the back of the truck ready to go on as long a tactical march as Hizzoner can dream up. There is not a piece of equipment exposed or likely to fall off during a rough journey.

The photographer snaps a picture and the men dismount. He takes another picture. Tarps are removed, revealing the mechanics of the load. A quick inventory shows that besides the 10 gun-crew members, the section chiefs have loaded the following equipment:

- 14 Blanket Rolls
- 14 Barracks Bags (A)
- 12 Field Bags (the driver and chief of section carry their own in the cab)
- 36 Rounds of HE in Ammunition Racks
- 6 Clover Leaves containing 36 powder charges
- 1 Set Camouflage Nets
- 2 Gun Tarps
- 1 Truck Tarp with End Curtain
- 1 10-Gallon Water Can (filled) (2 fives could be used better, one on each side of the truck)
- 1 14-Quart Bucket
- 1 M-4 Tool Chest
- 6 Shovels (2 long handle and 4 short)
- 2 Pick Mattocks
- 1 Pick, Railroad
- 2 Axes
- 1 Trail Log (a cross tie obtained by local exploitation)
- 9 Stakes for Camouflage Nets
- 1 Wooden Maul
- 1 2-Gallon Copper Oil Can

Everything on the truck is TBA. Nothing was left out and nothing added, but from the rear you wonder where all the equipment is located. A thorough check reveals the following facts:

The load is started by placing under the seats and toward the front all articles not immediately needed on occupation of position. These include mostly blanket rolls, barracks bags,



*Without personnel, the load doesn't have a gypsy look. Tools can be seen at right, under the seat, and the tool box at left. All equipment is protected from rain or intense heat.*



*Tarps and camouflage nets have been stripped away to show arrangements of ammunition, field bags, and barracks bags.*

and wooden maul. Field bags are strapped to the front slat of the seats. Next come the ammunition frames, placed in a T formation with the top of the T against the front of the truck. Shells are then racked, and powder charges are stacked at the rear of the truck bed so as to form as flat a top as possible. The trail log is to the right of the ammunition.

All pioneer and entrenching equipment is pushed under the right seat, arranged so that items can be readily pulled from the rear when a position is occupied. The tool chest is placed on the left hand side of the truck, under the seat, for easy access.

Other small items (such as stakes for camouflage nets) are put in convenient spots under the seats. Unused space at the ends of the seats near the cab can be utilized for blanket rolls.

Camouflage nets and the end curtain are folded and placed on top of the shells at the front of the truck. Over this is spread one folded gun tarp, with the other one draped neatly over all. The water can, if one 10-gallon can is used, is placed on the left side of the truck at the end of the seat; if two 5-gallon cans are used, one is put on either side of the ammunition rack. The truck tarp, properly folded to fit, is heaped over the shell rack and powder charges lengthwise of the bed.

Your inspection of the work is finished, but to clinch the deal, you ask the chief of section to demonstrate the unloading as in a hasty occupation of position. It proves to be a good arrangement. Tarps are removed as soon as the howitzer is uncoupled, the tool chest is pulled out and conveniently spotted on the ground, and digging tools are easily removed from the rear without disturbing the men's personal equipment. Camouflage nets go over the side to a cannoneer waiting to take them. And without confusion the ammunition is passed back to its handlers.

But suddenly you become alarmed: where are the fuzes and primers? The chief of section eases your mind. The fuze box, he shows you, fits neatly and snugly in the trail of the howitzer, and the primers are in the glove compartment of the cab.

#### IMPORTANT NEWS

##### OF FIELD ARTILLERY TRAINING LITERATURE

Henceforth all field artillery training will be based solely upon official War Department manuals (field and technical). Fort Sill's familiar "red-books" are now a thing of the past—all sale of them is completely and permanently suspended, and the same is true of the pamphlets, blank forms, etc., formerly sold by the Book Department, Field Artillery School. Instructor's notes, writs, and examinations, however, which are considered valuable as training aids to units in the field, will be forwarded once each month to the Commanding General, Army Ground Forces. Certain selected items of this material will be chosen for distribution to higher artillery headquarters only.

##### *Field Manuals*

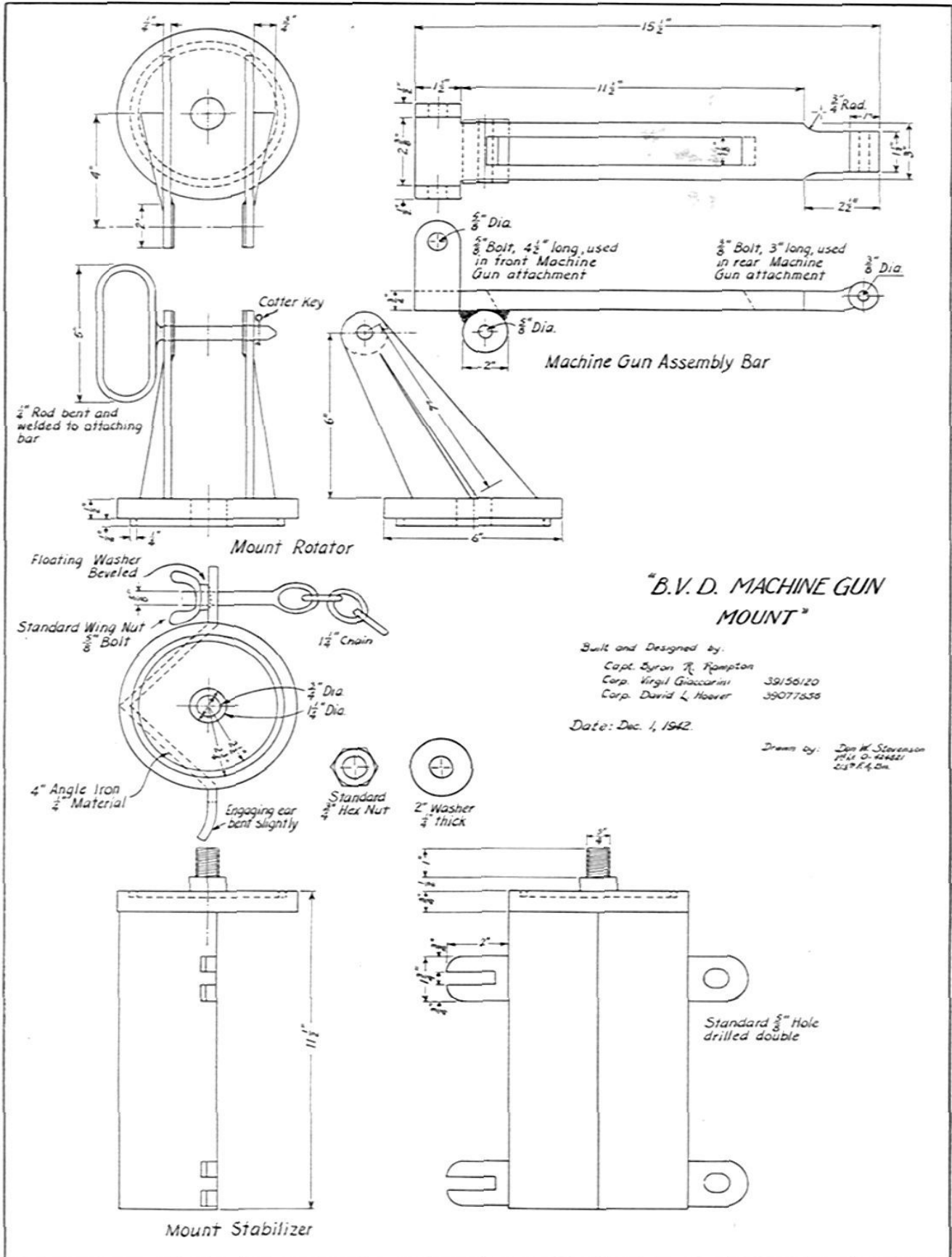
- 6-20—Field Artillery Tactics
- 6-40—Firing
- 6-50 to 99—Service of the Piece (for the various weapons)
- 6-100—Tactics and Technique of Division Artillery and Higher Echelons (Motorized)
- 6-101—The Battalion and Battery (Motorized)
- 6-105—The Armored Division Artillery
- 6-106—The Battalion and Battery (Armored Division Artillery)
- 6-110—Pack Artillery
- 6-112—Horse-Drawn and Horse Artillery
- 6-115—The Airborne Artillery
- 6-120—The Observation Battalion
- 6-125—Examination of Gunners

##### *Technical Manuals*

- 6-225—Field Artillery Trainer
- 6-230—Fire-Control Code
- 6-605—Field Artillery Individual and Unit Training Standards
- 6-650—Field Artillery Notes, Meteorological Data Using British 25-PR Range Tables

Manuals will be so arranged that a battery or battalion officer will need only three, in addition to his range tables: FM 6-40 (Firing), one Service of the Piece manual, and one unit manual. Unit or organizational manuals will contain all information (not incorporated in 6-40 or manuals on Service of the Piece) concerning the tactics, technique, and organization of the unit or group of units. Another similarity to the pattern pioneered by the *Field Artillery Guide* is the terse directness and absence of "wordiness" in these new books.

Your JOURNAL will keep you fully posted concerning the progress of this project.



# B. V. D. MACHINE GUN MOUNT

By Capt. Byron R. Rampton, FA

Faced with the possibility of going into combat with the old tripod ground mount and having to fire at aircraft from this mount, two machine gun corporals, D. L. Hoover and V.



Giaccarini, designed a post mount that would allow the .50-cal. machine gun to be fired at both air and ground targets. This mount can be installed on any fence post or tree stump, square or round, from 3" to 24" in diameter. Installation requires only a matter of 20 to 30 seconds, which is not only convenient but invaluable in case of a surprise aerial attack while on the march. This method of being able to fight back at low flying strafing planes would bolster morale immensely, because there is nothing that will break morale

faster than attack by low-flying strafing planes—and some units have already received as many as 20 such attacks during a day's march.

Any maintenance crew can make the mount in a very short time. Its base or lower part is made of a 1' length of 4" angle iron. On each side are welded two sets of ears, one set near the top and the other near the bottom. Those on one side of the angle iron have a hole through which passes a  $\frac{5}{8}$ " bolt which has a length of chain welded to one end and a wing nut on the other.



On the other side of the angle iron the two ears are notched just enough to allow one link of the chain to fit into the notch. Thus when the chain is wrapped around the post and one link is slipped in the notched ears, the mount can be securely clasped to the post by tightening the wing nut.

A circular steel plate  $\frac{3}{4}$ " thick is welded on the upper end of the angle iron. Its upper surface is machined smooth and has running around it (approximately 1" from the outside edge) a  $\frac{1}{4}$ "-deep groove. A  $\frac{3}{4}$ "

bolt 3" long protrudes through the center of the plate. On top of this lower steel plate is another plate which is also machined smooth, but in place of a groove it has a flange to fit the groove of the lower plate; it also has a  $\frac{3}{4}$ " hole in its center, through which passes the bolt from the lower plate. This upper plate revolves 360° on the lower plate, operating around the center bolt, with the greater part of the sideward thrust being taken by the flange and groove.



A set of forks 7" long with holes in the upper end, are welded to the upper side of the top plate. Ordinarily the gun would fit between the prongs of the fork, held in place by a pin passing through the holes of the fork and the hole in the gun regularly used to attach the gun to its ground mount. But the Ordnance was afraid that if the gun were supported by only one point pivot, it would soon hammer the connecting hole in the gun into an egg shape. To overcome this objection a straight steel bar was added under the gun; this bolts to both of the gun's ground mount connecting holes. In this way the gun is held securely at two points, and any movement or hammering on the gun itself is eliminated.

On the lower side of this support bar a piece of metal is welded directly beneath the pivot center; it actually fits between the forks on the mount. The pin passing through the hole in the forks and the hole in the metal piece secures the gun to the mount. The forks are slanted so that the hole in the upper end is directly above the outer edge of the steel plates. This allows the gun to be elevated 90° above the horizontal and depressed 60° below it.

The entire mount weighs approximately 25 pounds and is only 18" long, which eliminates problems of transportation.

## SOUND AND FLASH

German batteries in North Africa were frequently located by sound and flash ranging. In one abnormal instance, sound ranging located an enemy battery 20,000 yards from the sound base! Within nine hours of the start of our attack on April 23d, the observation battalion had the location of five enemy batteries; unfortunately two of these were beyond counterbattery range: the Germans are employing a gun about 7" in caliber, with a range reported as in excess of 30,000 yards.

# Seeing is Believing

By Lt. Donald G. Merritt, FA

At the Tank Destroyer School, the Tactics Department's course *Methods of Instruction and Training* is built around the basic objectives of all military training—victory in war, and the development of an offensive spirit in the personnel.

The inculcation of proper methods is greatly aided by the use of visual aids, on the theory that the student retains more of what he sees than of what he hears. Charts for the *Methods of Instruction* course are especially designed to be used as illustrations during conference periods, and to emphasize the high points of the instruction.

## "DO'S" FOR INSTRUCTORS

Figure 1 is an effective portrayal of the attributes of the "good instructor." In the upper left corner of the chart the instructor is seen thoroughly preparing his next day's instruction. He will have no embarrassing moments when that soldier with the Ph.D. asks a very difficult question, nor will his classes have the opportunity to settle back in their seats in anticipation of a boring period. Next, the good instructor starts his class off by pulling an ace out of his pack of information to arouse interest at the beginning of the period. The use of a "different" approach within sensible limits is important and is widely advocated.

In the upper right corner of Figure 1 is illustrated the choice of the proper method of presentation. Instructors are urged to use the most effective means practicable, and to choose the method that will give maximum instruction. It is highly ineffective to lecture on the .30-cal MG when the weapons are at hand for use in a demonstration or for a group performance.

No. 4 is a reminder that *all* military instruction must have "battle value." At this vital point the Army's aims and the desires of the average enlisted man agree: the Army wants to eliminate the enemy with the least possible expenditure of life and materiel, and the soldier wants to get as many Japs and Germans as he can and still come home with a whole skin. The instructor brings these similar trains of thought together to attain his objective—victory in war. He continually holds before the trainee the realistic aspects and battle value of the subject matter. This not only heightens interest but also hastens the efficiency of the instruction by bringing home to the soldier, in the initial stages, the ultimate purpose of his training.

In the right center of Figure 1 is a gentleman who is laughing off a bee-sting and probably repeating to himself, "Patience is a virtue"—exactly what the able instructor will have to do. Trainees can introduce the most ingenuously painful remarks, questions, and answers. A little "anticipatory planning" will aid the instructor in keeping control of the situation.

The corollary of patience is a sound sense of humor, illustrated in No. 6. An instructor should occasionally show the lighter side and interject amusing illustrations from his own and others' experiences. A session may be opened with a joke, if it is timely and applicable—but when a joke is told, be sure it is good. There is nothing more disinteresting than an attempt to put over a moth-eaten piece of humor.



Figure 1—"DO'S" for Instructors

While occasionally showing the lighter side of the instruction, a good instructor will also remember the effectiveness of its graver aspects. He will pick these points out and drive them home forcibly and emphatically, as shown in No. 7. He will reserve his "rostrum-rapping" for the serious subject matter, where such tactics will be effective.

The last sketch in Figure 1 is largely self-explanatory. Public speaking ability may be inherent but in most cases will have to be acquired the hard way, through study and application. However acquired, it is an essential to successful instruction. Preparation, presentation, poise, sense of humor, and emphasis are all necessary, but all instruction is wasted by an instructor who pauses, shows uncertainty, or neglects to take advantage of the "speakability" of his material.

## "DON'TS" FOR INSTRUCTORS

Just as the omission of certain essential "do's" will decrease the effectiveness of instruction, commission of the "don'ts" shown in Figure 2 will have a positively detrimental effect. Most of the "six sins of commission" shown are self-evident, yet few class periods are completed without at least one of them appearing.

An instructor never presents his back to the class, however edifying he may consider that portion of his anatomy to be. Turning the back immediately breaks that elusive thread by which the instructor has connected himself with his students. Furthermore, it means a momentary disappearance of that omnipresent eye of authority and control with which the class instinctively endows the instructor. Here is also shown the improper use of the blackboard: it is obscured, further nullifying interest. While full use of the blackboard and any illustrations is highly advisable, whenever possible such material should be prepared beforehand. This material can be covered with paper which is stripped at the appropriate moment. If it is necessary to write on the board during the class period, an



# THE LECTURE

By Lt. Col. S. W. M. Whitehead

## SUITABLE LECTURE SUBJECTS

I consider that the following are suitable subjects for lectures:

a. Technical subjects which have to be presented in a nontechnical manner. For example, in this school we have a mixture of all arms of the service: infantry, artillery, engineers, signals, ordnance, and so on. Each has to learn something of the work of the other. NOT technical details, but broad outlines of characteristics and capabilities. Well now, those subjects are all suitable ones for lectures.

What is the use of giving the artillery field manuals, for instance, to a group of infantrymen, and expecting them to orient themselves in the time available in a course such as those run here? It cannot be done, but an artilleryman *can* extract the necessary broad principles and put those over in an orientation lecture.

b. Subjects in which the field manuals require enlarging upon, from experience, in order to make them valuable—for instance, umpiring. The manual gives all the mechanics of the subject, the calculations, use of flags, and all the detail which makes extremely valuable reference data for an umpire who has had experience.

But personally I would hate to be umpired by a man who had done nothing other than read the book; he would be quite insufferable, and a hindrance rather than a help.

c. Subjects which have changed since the manuals were produced. An example of that is Combat Orders.

If the only thing we knew about orders was what is written in the manuals we should be so busy writing field orders that we would never have time to do any fighting. We learned that lesson pretty early in the war. Practically NO written field orders were issued, even from British G.H.Q., in France from the time that large scale operations started until the DUNKIRK evacuation. There just wasn't time to write them.

The moans and grumbles are just beginning to filter in from Malaya, the same old ones—"beaten by time," "the orders never arrived in time," and so on. Well, that can't be put right by reading the book. Somebody has got to hammer all that home by a lecture or lectures, to show the difference between COMBAT orders and the bookish written field orders that were produced for examinations in peace time.

Furthermore, the habit of writing copious longhand notes when receiving oral orders is just childish nonsense. There is only one way to take down an oral order, and that is on a map. But there is nothing about that in any book that I know of; it has got to be thumped home by a lecture.

d. Subjects based on experience, personal or known—experience of some particular operation, or campaign, or maneuver.

e. Subjects on which the references are so numerous that students are unable to make a complete study in the time available. Here of course the lecturer makes the study and passes the relevant information on to his audience.

## A PREPARATION METHOD

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*This is a portion of a lecture on Methods of Instruction, delivered last fall by an officer of the General Staff of the British Army, to American and Norwegian instructors at the U. S. Army Forces Tactical School in Iceland.*

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Now for a method of preparing lectures. I can only give you my own method because that is the only one I know. It is a laborious method, but then the process of preparing a lecture is a laborious one anyway, if the lecture is to be worth listening to. I find it takes me anything from four to sixteen hours to prepare a one-hour lecture.

### *Preliminaries*

The first step is to read every reference to the subject that I can lay my hands on. Not only field manuals, but training memoranda, extracts from papers, novels, autobiographies—American, British, German, any other nationality. I find that some wily bird in the audience sooner or later takes the greatest delight in standing up and quoting some authority in direct opposition to what I have said. That sort of challenge must be met by a quick and a sound answer, if you are to retain the confidence of your audience. You can only give such an answer if you are absolutely at home with all the angles of your subject. From this study of references I make a list of notes, just rough ones, which enable me to check up for details later on.

### *Framework*

My next step is to make a framework plan of how I am going to break the subject down, and the sequence in which I am going to put the subject matter over. The principle which I adopt here is to break the lecture into three parts: the opening, the body of the lecture, and the conclusion.

There are many ways of framing an opening paragraph, and I consider that a lecturer should alternate between them. The object, of course, is to rivet the attention of the audience, to make them realize that the subject which is to be dealt with is the most important one that they can ever be asked to study. In a school such as this there is often another object also—to interrupt the gentle sleep into which the students have been lulled by a combination of heat, lack of fresh air, last night, and the last instructor!

Several openings come to my mind as typical.

The "apology opening," for example, where the lecturer apologizes for being late or for taking up the time of the audience, or for having but a limited knowledge of his subject, or anything else he can think of. In my opinion that is definitely bad. If a lecturer is late he won't put it right by wasting more time in talking about it. If a lecturer says he is sorry that he is taking up your time he is a liar, because everyone knows that he is really very pleased to have an audience. If he apologizes for a limited knowledge he is a fool and is saying so; he will never be able to hold the interest of his audience because they won't believe in him.

Then there is the "joke opening," where the lecturer tells



some story with the object of arousing his audience by laughter. This, in my opinion, is an excellent method, but a dangerous one. First, the story has got to be really funny; secondly, it must be new to the audience; and thirdly, the lecturer must be able to put it over—NOT an easy task. I say this method is dangerous because nothing is more embarrassing to lecturer and listener than the joke that fails to raise a laugh, particularly where it happens right at the beginning of a lecture.

Next there is the "shock opening"—where the lecturer bluntly and boldly makes some sweeping or controversial or highly unorthodox statement, pauses a moment so that his audience may grasp the full significance of what he has said, and then goes on to elaborate his theme. This is a little difficult to explain, but I will try to show you what I mean by an exaggerated example. Imagine you are taking the 0800-0830 class. You open like this:

"Gentlemen, I am sure that 50% of you have had no breakfast. I am sure that 50% of you are still asleep. And I am sure that the Germans will win this war unless we face facts, cut out the theoretical fripperies and get down to practical combat training at once." Well, that of course is a pretty hot one, on purpose, but it would fulfill its object. The lecturer reaches out for his audience, grasps it, hits it right between the eyes, then thumps his theme home while the listener is still groggy. I haven't used that particular opening yet, but I think I will on one of these dull mornings.

The "topical opening" is where the lecturer gives some item of red hot news which has a bearing on his subject. It usually starts off with something like "Gentlemen, it was announced over the radio five minutes ago that so on and so on; now that announcement just goes to prove once again what I am going to tell you this morning, blah-blah-blah." A good type of opening, but the opportunity does not arise very often. However, one thing is certain; the lecturer who can use an opening like that, provided it is really apt, is a smart one, and his audience will realize it at once.

Lastly there is the "experience opening," where the lecturer relates some experience having a bearing on his subject. This again is an excellent opening because nothing arouses more interest than actual experience, but it is not easy to handle. The chap who starts off with "Well now, gentlemen, when I was in Poonah . . ." will get just the reception which you gave it then—an unwanted and unexpected laugh.

Well, I must not spend any more time on the opening of a lecture, but I do consider that I am justified in spending the time that I have. I am quite convinced that whereas a good opening cannot cover up an otherwise bad lecture, the reverse is true, and a bad opening will ruin an otherwise good lecture.

Now for the body of the lecture. Here is where the main theme is developed. The development must be logical and crystal clear. Personally, I believe in making a statement as to how I am going to handle the subject, so that the students get a clear picture from the start. I also believe in breaking the body of the lecture down into definite paragraphs and saying the paragraph headings as I come to them.

I would like to make just a couple of points about the conclusion. It is an accepted fact, I think, that generally speaking listeners retain the thing they hear last longer than anything else, and that is why in my opinion the concluding

remarks of a lecture are so vital. They must be carefully framed, they must sum up the whole field covered by the lecture, and finally they must be driven home with every ounce of power of which the instructor is capable.

#### *Mechanics*

Now for putting the thing together. Personally I find it best to write all my lectures verbatim, in longhand. Now, I am not advocating that method; I will merely give you my reasons for doing it that way.

First, I find that it helps me tremendously in remembering my subject matter. I don't mean that I memorize it, but I know where I am all the time. Secondly, it enables me to frame my phraseology. I am able to turn my sentences until, in my opinion, they carry the weight required of them. I am able to insert the alliteration here and there which brightens the script, and so on.

Having written the lecture, I have it typed out, double spaced, on plain foolscap paper, with a wide margin, so that the lines of typescript are fairly short and easily read.

My present clerk has been typing lectures for me for nearly two years now, and so he knows he must never end a page with part of a sentence. Each page ends with a complete sentence.

I break the script down into frequent sub-paragraphs and underline the first few words of each in red. Those serve as my notes when I am lecturing, which I do off my verbatim typed lecture.

#### POINTS ABOUT LECTURING

Now for a few points on lecturing, again based only on my own experience.

The first and most difficult thing to realize is that one is talking with and to a class, and not at it. The thing is entirely personal. A lecturer must reach out to his audience, he must put himself on their level and feel their reactions to what he is saying, all the time. He must play on their sense of humor, sense of feeling, sense of fear—anything he likes, as long as he holds them. He must make absolutely certain that the vital parts of his lecture have really gone home, and he must use every means in his power to ensure that they do so.

He must be quick to sense any distraction, and put it right.

Finally, by his own concentration, determination, and enthusiasm he must gain the concentration, determination, and enthusiasm of his audience.

Well, so far we have said what he is to do, but little about how he is to do it.

Making the thing personal is merely a question of the mental attitude of the instructor. He must make himself realize that he is working *with* the class. He must rid himself of any idea that he is a superior sort of being, and he must never forget that his sole purpose is to teach—not to be clever, not to test, not to gain personal kudos, but to teach.

The process of getting down or up to the level of the students is carried out before the lecturer ever gets on the platform. That is done in his preliminary study and in the framing of his lecture.

An instructor must be looking for signs of the reactions of his class all the time that he is talking. The commonest one, of course, is students going to sleep. If I see one student asleep in my class I don't worry very much; I just wake him up with a jerk, the severity of which is dependent on the type of student that he happens to be. If I see three or four students asleep I do begin to worry, because that proves that there

is something very wrong; not with the students, but with me or my lecture. When I look around and see everyone looking up at me I know my stuff is going over, and that that is the time really to give them the works, when they are all receptive.

Holding interest—well of course your lecture has got to be interesting to start with, and with careful preparation you can make an interesting lecture about anything. There are hundreds of little ways in which you can retain interest, and the best way to learn them is by listening to other people's lecturing technique.

One of the most effective methods, provided it is not overdone, is the personal idiosyncrasy; I do not mean a habit of scratching your head or pulling your ear, but some little oddity which is pleasant and fascinating. I'd give anything I've got for Carl Stenersen's accent, for instance, Winston Churchill's English pronunciation of words like Nazi and Gestapo, your President's accentuated diction, Raymond Gram Swing's "Goodnight"; those are all little points which help to rivet attention.

Delivery is a great factor too, of course. An expressionless delivery is boring. Too quiet a delivery makes listeners annoyed, because they cannot hear what is said. Too quick a delivery means that the proper weight cannot be given to what is said. The commonest mistakes made by inexperienced lecturers are these: talking too quickly—the rate for lecturing is extremely slow if the lecture is to be clear and impressive; and allowing the voice to drop at the end of a sentence, which is very difficult to avoid.

Distractions—the instructor should take care to eliminate every likely source of distraction before he starts talking. He should ensure that he himself is properly dressed, and as smart as possible in appearance.

He should be quite sure that there is nothing on the rostrum which is not necessary to him. Such things as yesterday's charts and the last instructor's blackboard drawings should be removed.

There should be one point of attention and one only—the instructor.

If you notice that some of your audience are becoming absorbed in a distraction, turn it to your own advantage. Take control and grip again by directing everyone's attention to the

distraction by some remark or other. Then, having regained control, swing the whole audience back again to your channel of thought. That is very easy to do, and should be done at once, and of course the source of distraction must be removed.

The lecturer must be alert, both mentally and physically. He should hold himself smartly, or his class will become slovenly; similarly, if he has to move he must move quickly and smartly. The good lecturer is really a good actor also.

Aids to lecturers are the well-known ones: blackboards, charts, slides, film strips, films, etc., all valuable aids if used in the right way.

In my humble opinion it is impossible to beat the blackboard, but the drawings must be clear. These miserable little squiggles that we sometimes see do more harm than good. Let the drawings and writing be bold, so that everyone can really see them.

Charts are undoubtedly good, provided they are absolutely clear, but it is very difficult to get a draftsman to make them so; it is an artistic tendency to produce something neat and too small. Furthermore, they should be simple—just a few bold lines and very little writing. Charts are particularly useful for things like paragraph headings for field orders, but be careful in using them lest they become distractions from you, the instructor.

Slides, film strips, films, are all absolutely first class provided they are not substitutes employed by a lazy instructor. With these things you of course have no control over the class, which may quite well fall asleep in a body. One word of warning if I may: don't show any training film until you have seen it yourself, and assured yourself that it is really up-to-date and teaches the lessons you want taught.

Demonstrations can of course be introduced into lectures, but we will deal with them under a separate heading.

Well, gentlemen, I have purposely spent a long time on the subject of lecturing. I have seen it stated time and time again that the weakest method of instructing is the lecture, but, personally, I heartily disagree. It is not the method of instruction that is weak—it is the fact that the standard of lecturing is so low. I maintain quite sincerely that lecturing is the very best method of teaching certain subjects, provided that the lecture is properly produced and presented.

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#### GRAPHICAL FIRING TABLES AND SHORT BASE SLIDE RULES

Graphical Firing Tables for all field artillery weapons of caliber above 105-mm have been prepared and are now being procured. The Short Base Triangulation Slide Rule, for solving short base problems, has been recently standardized and will be available about 15 September 1943.

Graphical Firing Tables, M4 and M10, for 105-mm and 75-mm are now available for issue in limited quantities. Requisitions will be submitted through normal supply channels by units authorized this item. Basis of issue is 5 each per headquarters and service battery and 5 per firing battery. Authorization should be indicated on requisition substantially as shown below. Basis: Initial issue per

T/O 6-25 (105-mm How) and corresponding T/E

T/O 6-155 (75-mm How) and corresponding T/E

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States the commander of an armored field artillery battalion, who fought throughout the North African campaign:

"It has been my experience that the principles of the tactics and employment of Field Artillery with an Armored Force are identical with the tactics and employment of Field Artillery with any other force. Tactics and employment of Field Artillery as taught by the Field Artillery School are correct and adequate."

# German Conduct of Fire

Experience shows that in executing observed fires the most difficult problem is to reach unbiased conclusions regarding where a shot has been placed, and to force oneself to draw correct conclusions therefrom as to the conduct of fire. Once this difficulty is overcome, shooting will not be found hard: if the shot is an over, decrease the range; if it is observed as a short, increase the range. If the shot lies to the right the plane of fire must be moved toward the left, and vice versa. Provided the officer firing has also trained himself to make vigorous instead of timid corrections, he will be master of the situation.

Requirements set down in the firing regulations must be observed at all times. The art of executing fire

does not consist in departing from regulations at will, in the hope of quickly achieving success, but in following at the decisive moment the one regulation that really applies.

All firing is action from the point of view of tactics: which is to say that each target must be fought according to the urgency of the circumstances, using whatever method will yield the promptest results. Targets rarely wait to be shot at; the artillery, therefore, is always in a hurry.

Do not fire simply by routine methods, but allow scope for the imagination to adapt itself to actual circumstances: shoot not only at points where a target can be clearly recognized, but likewise at targets whose location can at best be surmised (e.g., an observation post in an isolated patch of woods).

Never shoot without bracketing, even if the brackets should turn out to be rather deep. No shot counts that does not hit the mark.

Proceed vigorously in making corrections, those for deflection as well as those for range (bracket toward the target from the side, so to speak). No splatterdash firing!

In practice fire, fire at the targets indicated by the officer in charge. For the purposes of field firing, choose the targets that are tactically the most important (i.e., the most dangerous).

Observe at first with the naked eye, then with binoculars, and finally with the scissors telescope. Confidently expect that you will be able to see the point of impact or point of burst without using glasses. You may be able to locate it. Do not use the scissors telescope until you are sure the shot will come within the instrument's field of vision.

Lookouts should report impacts and bursts by the calls "Attention!" or "Impact," respectively. Do not begin observing through binoculars or the scissors telescope until the word "Attention!" is heard. This will help to avoid fatiguing the eye.

Relax before beginning observation. Look into the open landscape when observing through a telescope. Begin by focussing the eye on a point close to the target, so as to be able promptly to shift focus to the target itself.

Maintain a natural, unbiased attitude of mind while observing! Do not let your hopes influence your observation. Have the courage to say "Lost!" or "Doubtful!"

For observing a first shot, especially in broken terrain, wait

for smoke and detonation before you make the report. Do not cease observation too soon, but do not waste time looking around long after the shot has been fired. After hearing the detonation, even though no smoke

**Much of Germany's artillery doctrine was "borrowed" from our Field Artillery School some years ago. Since then Fort Sill has developed and refined its methods even more, but some of the German points are well worth reviewing (1) as a direct restatement and refresher of our own thought or (2) to understand our adversaries the better. This material is from a German artillery manual published in 1941.**

was visible, at once make vigorous corrections of deflection or elevation. If not even a detonation was heard, have the shot repeated once without making a correction. Use a watch to anticipate the time of impact. If again nothing is heard or seen check the firing data, as well as the commands executed at the gun position. Then make vigorous corrections of site or deflection or, if necessary, change to time fire or smoke shell.

If the observation is "doubtful" it will in most instances be possible to describe the shot as doubtful with regard to either range or deflection. Special care is required if the points of impact are close to the target. Give no sensing at all for a shot of doubtful range rather than have a whole series of bad shots as a result of wishful observation.

To obtain prompt increase of the effectiveness of fire, first issue a new fire command (data to the recorder) and then observe the last round.

In firing at a small objective, especially with one of the smaller calibers, place the impact cloud slightly to the windward.

Irregular lateral position of ricochet bursting points with respect to one another is not sufficient evidence that the shots were not fired from parallel barrels! The lateral position of such bursting points is to some extent determined by the nature of the terrain at the point of ricochet.

Rotate registration duty among the pieces of the battery (to equalize the burden of duty for all pieces, and provide training for gun crews).

When there is a telephone call from the battalion, the battery commander should not at once go to the telephone in person or connect the extension. It is better to have another officer or the NCO in charge of aiming circle receive the orders.

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Artillery must not adopt a defensive attitude, or the artillery engagement will take on a passive character and remain behindhand. On the contrary, the artillery must endeavor to inflict harm relentlessly upon the enemy. With that end in view, artillery must not only appear on the scene of battle promptly and, if possible, in superior force, but also be in readiness to open fire immediately.—*German Artillery Doctrine*

# Use of Training Film in the German Army

Major Scholz, in *Artilleristische Rundschau*

All kinds of instruction means play a great part, particularly in the time of the individual instruction. With their help we can render clear and understandable many processes, objects, and operations which, to say the least, are many times not easy for the young soldier or cannoneer to understand. Plates, views, series of pictures, models, and instruction films belong to this kind of "instruction means."

Among these means of instruction the film has been especially successful in the last few years. The numerous products of the Army Film Department constitute an eloquent witness of this fact.

What now constitutes the special value of the instruction film and what are its advantages in comparison with the other means of instruction?

At the beginning of individual instruction it is essential that we impart to the young artilleryman as soon as possible an idea of the nature and effect of his arm and of the activity of a battery. If once he has found out the purpose and goal of training, he will show a greater understanding and be more devoted to it. This procedure will make training easier and faster, without a doubt; this will certainly be appreciated now to the fullest extent by the artillery replacement units. Of course, this goal can certainly be attained through other means of instruction—that of the ordinary kind, by lectures, plates, simple exercises on the terrain or in a sand box—but such means generally lack movement and are not graphic or lifelike. But such practice exercises or illustrations on the terrain cost time, pains, and effort—particularly in the case of artillery—and even then we have no assurance that the spectator will learn what he should from them. The film does not have this weakness. Its very nature is such that it will not be tiresome or monotonous and will at least always be welcome as a change. The presentation is independent of the weather, the season of the year, and the time of the day; does not require very much time; and can be repeated as many times as desired. The film catches and holds our eye and at the same time impresses itself upon our memory better than a multitude of words which only too often fail to hold our attention. The view sticks, due to the limited surface of the picture. Another important factor is that the film is a common pictorial means which the recruit loves and esteems from his acquaintance with it in civil life. Even if he sees the film frequently, each showing is an event which does not fail to make its impression.

A widely ramified and complex arm such as artillery can, above all others, secure great advantages from the instruction film.

The artilleryman of today must not only lay and fire, ride and drive, but he must have an extensive knowledge of numerous other fields such as motor vehicles, signal communications, surveying, meteorology, etc. This requires an acquaintance with numerous other instruments, tools, and auxiliary devices which—just as in the case of the gun itself—may often be regarded as masterpieces of technology but which at the same time and for this very reason are as a rule very complicated and

difficult to manipulate. In spite of this, the simple cannoneer must be acquainted with them. Here is the place where the instruction film comes in.

With its help we can make clear the construction (in general and in detail) and the operation of all these complicated vehicles, machines and apparatus. We are able in particular to give a graphic presentation of difficult and complex movements taking place under cover or in places difficult of access and to as large a circle of spectators as desired. By means of the slow motion film it is even possible to analyze a very quick process, slowing it down or repeating and holding the film at places that are particularly captivating or instructive. It is a means by which we may, for example, make clear the working of the traversing handwheel, the gun recoil, the engine, or the vehicle just as we may use it, of course, to illustrate the movements of a riding horse, a team, or the trajectory of a projectile. In the same manner then the serving, manipulating, handling, and cleaning of the cannon, vehicles, and instruments, the assistance to be rendered in riding and driving, the traffic rules, construction and operation of the signal communications, in short the whole field of training is presented in a deliberate and impressive manner before the eyes. When it is a question of accurate manipulation of hand wheels (for example) or of performing delicate operations the processes may be represented in slow motion by means of the slow motion film, or they may be analyzed by animated drawings. Let us consider merely the turning of a switch, the use of a spade, or the loading and laying of a gun. The screen can also show errors in a particularly effective manner, and condemn them, especially when it shows the unfortunate consequences of their faulty use in a vivid manner and then shows the "correct procedure."

Lastly, as a crowning of the whole, we show the activity of the battery. In a few minutes we can impress upon the spectator in a very clear, forceful and lasting manner the meaning and purpose of the numerous parts and operations, how they are related to each other, and what a complicated piece of mechanism a battery represents (here and only here, of course, does the "trick film" have its justification), whether it is on the march or in combat, in attack or in defense against tanks and airplanes, in gas attacks, etc.

The nature of other arms and branches can also be presented in a more effective and rapid manner with films than with words and pictures. In this way it is possible in particular to show the indispensable cooperation of the artillery with the infantry, tanks and air forces, and to present all the details in an instructive manner. Furthermore, it will not do an artilleryman any harm to learn something about anti-aircraft artillery or naval artillery. We can also show in greater detail the employment and battle action of the Stukas, which, with their bombs, often supplement the action of the artillery.

As a basis of all military training and all military activity the regulations should be our guide, but to many persons the

regulations seem to be a book with seven seals for which soldiers oftentimes feel a certain aversion. But if they are skillfully filmed, as above pointed out, they lose much of their terror. In this way the matter treated in the regulations is given life, form, and color in the eyes of the simple cannoneer. Even the dry and prosaic material becomes instructive and attractive.

confusing details should be omitted and the explanations should be brief and concise. The film should never be tedious or boring but every word and picture must be full of life. Striking designation of contrasts ("Right," "Wrong") may improve the effect from time to time. Where feasible or particularly impressive and necessary we may also use the



*Crew of 15 cm. howitzer receiving training in firing while wearing gas masks*

If the regulations must be brief and concise, then the instruction film makes it possible to supplement them by a detailed presentation.

Of course, the instruction film becomes much more impressive and effective when it is given as a talkie, in other words, when the various pictures and situations are accompanied by brief explanations. If the wording of these explanations is based on the regulations, then we have an advantageous combination of instruction film and regulations. It will also promote standardization of training within the arm and branch.

Thus, the instruction meets in every respect the age-old requirement of all instruction, namely, "learn at play," and at the same time gives essential military instruction.

But if the instruction film is to do all this work, then it must meet certain requirements.

First of all it must show everything distinctly and in clear outline and show only that which should be shown; and it should show this in full detail and without any gaps. All

color film, as, for example, in the field of camouflage and fire.

Of course, we must adapt every instruction film to the current changes in service regulations, materiel, tactics and technology. The parts that are out of date are cut out and replaced by new ones. We must not hesitate to change a film completely or "shoot" it again.

At any rate the film should instill in the young soldier and cannoneer a well-grounded and lasting familiarity with his arm, his gun and his instruments. It must show him that a complex arm such as artillery with its destructive shells can accomplish any firing mission, if it is served and employed properly, and that the team or traction means can overcome all obstacles. Thus, every instruction film should spur the spectator on and awaken his enthusiasm to such an extent that he will want to do what he sees done on the screen.

If we say that the use of instruction films is childish sport and reject them, we forget that they are the very thing for the ordinary soldier and that they force him to think in terms not of himself alone but in terms of a larger unit, a battery at least.

Place command posts near an observation post where the view covers as completely as possible all terrain comprised in the observation sectors assigned to the various batteries of the command. "The side that commands the best view will secure most of the hits!"

—German Artillery Doctrine

# PACK ARTILLERY AFLOAT

By Maj. G. M. Payne, FA

When Pack Artillery finds it must cross an unfordable stream, it need not sit back idly on its haunches and wait for the engineers to come along and construct a bridge. It has, in each battery, equipment which can easily be converted into serviceable boats with which to ferry across its howitzers, fire control instruments, ammunition, and miscellaneous gear. The animals and most of the men will, of course, have to swim.

In constructing and using this boat there are several simple but important principles which should be followed. Carelessness may result in the loss of time, animals, equipment, or men.

As the stream is approached, the first thing to look for is a low bank giving easy access to the water, and with ground firm enough to give the animals a good footing. The opposite side should have the same characteristics. To make sure of this, a scout should be sent across to the far bank before either animals or equipment are taken over.

Having decided on the point of entrance, the animals are brought up and unloaded as near the water's edge as possible. Pack saddles are removed and the animals are swum across to the far bank by their drivers. Having the animals taken across first gives them more time to dry off before being saddled again. Those known to be sure swimmers should lead the way, so the more timid ones will follow. One of the last animals across should drag with him a long rope made of several lash-ropes tied together; this will be used later to haul the boats across.

While the animals are crossing, cannoneers should be busy building the boats. A rigging cover is spread out on the ground near the water. Five pack saddles are placed in a line with their footrests on the edge of the cover. They should be centered so there will be an equal length of cover at either end. The saddles are lashed firmly together by a lair rope looped through their frame arches. When this is finished, the saddles as a unit are rolled over onto the center of the canvas.

Now the footrests are tied together. A lair rope is looped over an end footrest, and is continued around the perimeter of the saddles to loop together all adjacent footrests. Then the sides of the rigging cover are lifted until they fit snugly around the outside of the saddles, and the ends of the cover are folded and placed across the end saddles. Still another lair rope fastens the canvas to the footrests. At each pair of footrests the canvas is bunched and drawn up through a loop in the rope. This completes one half of a boat.

For making the second half, the procedure is exactly the same. When both halves are finished, they are placed in the water side by side and fastened together down the center by a rope looped around their adjoining footrests. Then a lifting bar is placed on top of the saddles and under the folded canvas, at each end of the boat. The center of one of these bars is lashed securely to the footrests in the center; the rope is continued to one of the outside footrests, and the bar is

In the *Journals* for January and December, 1942, Lt. John B. Sweger described "stream expedients" for motorized equipment and howitzers. Maj. Payne adapts similar principles for pack units.



Figure 1. Saddles are lashed by their frame arches.



Figure 2. Footrests lashed together.



Figure 3. Canvas fitted snugly around saddles and tied to footrests.



Figure 4. Two halves of the boat are lashed together down the center footrests.

lashed securely at this point. Then the rope is carried under the boat and up to the end footrest on the other side, where the bar

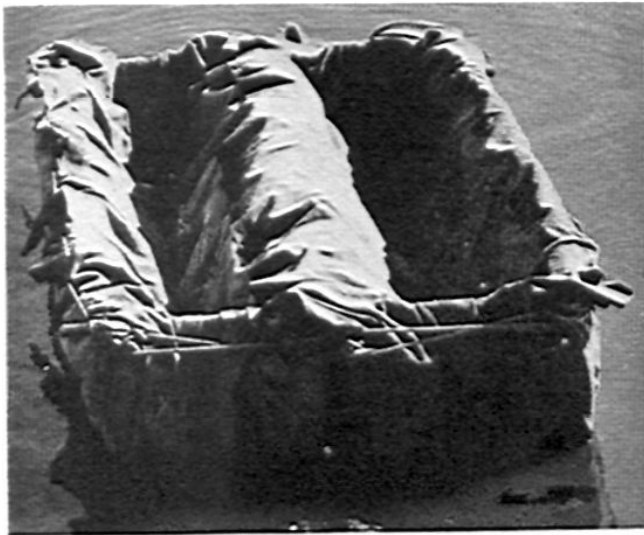


Figure 5. Lifting bars lashed to ends of the boat for stability.



Figure 6. A method of loading the tube, bottom sleigh, cradle, breech ring, and top sleigh.



Figure 7. One Pack Howitzer, complete, in improvised boat.

is lashed for the last time. The lifting bar at the other end of the boat is fastened in the same manner. These lifting bars add rigidity and stability to the boat and prevent any possibility of its buckling. Once the boat is securely fastened together, the canvas at the ends is unfolded and draped back over the interior of the boat to form a protective cover for the saddle pads and help to keep them dry.

This boat will safely carry about 2,000 pounds. (In tests it has held one complete howitzer and seven 170-lb. men—a total of nearly 2,500 pounds. But this left very little freeboard.) With a 2,000-pound load there will be at least 6" of freeboard. The number of trips required to ferry the equipment of any given unit will depend on the amount of equipment and the number of boats constructed. Of course, a smaller or larger boat can be built on the same principles, but this size seems to be the most practical.

In placing the disassembled parts of the howitzer in the boats, care should be taken to insure a balanced load. Here is one practical arrangement of the pieces: The tube and bottom sleigh end-for-end in one half of the boat, and the cradle, breech ring, and top sleigh end-for-end in the other half; put the rear trail and wheels in the side containing the breech ring, with the front trail on the other side. This is only one suggested arrangement; several others may work as well. In any case the front and rear trails, being the heaviest pieces, should always be placed in the central part of the boat. Once the howitzer is loaded there will still be additional room for men's packs, rifles, ammunition, and other equipment.

Getting the boat across the water obstacles may be accomplished in several ways. The best method is to send a rope across with one of the animals, as suggested earlier. Then the rope may either be anchored on both sides and used by men in the boat to pull themselves and the boat across, or it may be tied directly to the boat and used by men or animals on the far side to pull the boat across. If necessary, shovels or other improvised paddles may be used by men in the boat.

Advantages of this method of stream-crossing should be apparent. The boat itself is quickly and easily constructed. In addition, it is strong, fairly easy to maneuver, and will remain afloat for a considerable period of time. And as all the equipment used in building the boat and moving it from one side of the stream to the other is included in the Table of Basic Allowances for the Pack Howitzer battery, no aid is required from any other troops. The time saved may in some cases become a decisive factor in succeeding operations.



Figure 8. Shovels from the Pioneer Roll make dandy paddles.

# .30-CAL. MOUNT FOR M1 155 GUN

By Brig. Gen.  
C. P. George

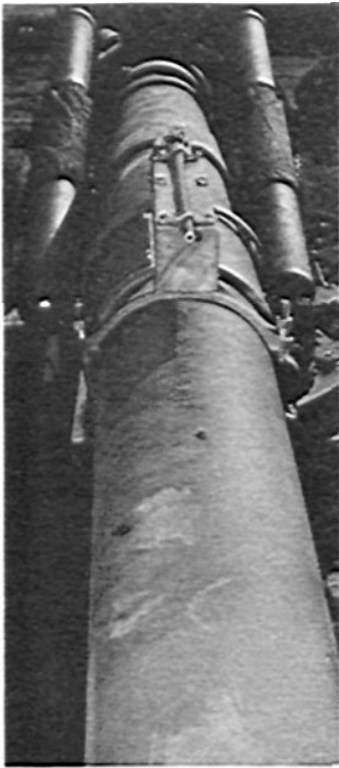


Figure 1—The wooden member is grooved and notched to hold the rifle (with its stock removed). Two metal clamps tie the rifle to the timber. The first blocks were made of fir; these did not stand up, but oak blocks are still in use after firing several hundred rounds.

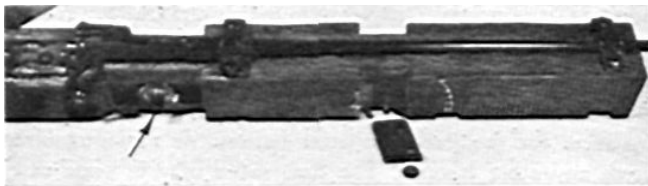


Figure 2—Metal trunnions set in the sides of the block near the rear fit into the trunnion bearings of the 37-mm mount.



Figure 3—To bore-sight the piece, the mount is designed to permit elevation and depression of the muzzle. This is done by drilling a vertical hole in the block, inserting a  $5\frac{1}{2}$ "  $\times$   $\frac{3}{4}$ " machine bolt, welding a  $1\frac{1}{4}$ " threaded portion of another machine bolt to the 37-mm bracket, and adjusting the angle of elevation of the mount by use of a  $1\frac{1}{4}$ "  $\times$   $\frac{3}{8}$ " hexagonal connecting nut.

To meet the demand for a sub-caliber mount for the 155-mm M1 Gun with a projectile that would both be cheap and give bursts satisfactory for sensings, the 144th FA Group developed a sub-caliber (.30-cal.) mount consisting essentially of a U. S. Rifle, Caliber .30, M-1917 (Enfield), with stock removed, affixed to a block of 4"  $\times$  4" lumber. This block was attached to a mounting bracket for the sub-caliber 37-mm M1, for mounting to the 155-mm gun.

During service practice a 4-gun battery was used. The 155-mm guns were put in position adjacent to each other, which gave a 2-yard interval between pieces. Gun crews consisted of the normal complement necessary for loading and firing the piece, plus a loader and firer for the sub-caliber. To increase realism an extractor for the 155-mm dummy projectile

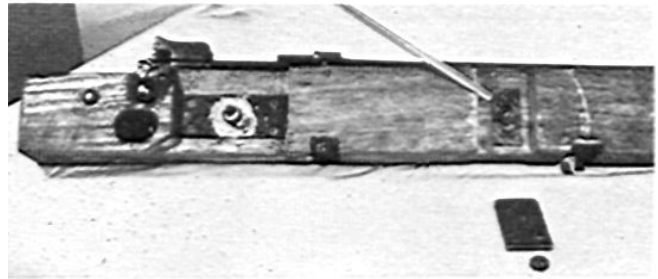


Figure 4—To fasten the mount to the 37-mm bracket in front of the trunnions, vertical slots  $2\frac{3}{8}$ " wide by  $\frac{3}{4}$ " deep are cut on each side of the block. In each slot is a metal strap  $\frac{3}{16}$ "  $\times$  2"  $\times$   $4\frac{1}{2}$ ", threaded to fit a  $\frac{3}{8}$ " bolt. These straps are fastened to the mounting bracket by tapping threads into the sides of the brackets and securing the metal strap to the bracket using 1"  $\times$   $\frac{1}{4}$ " stud.

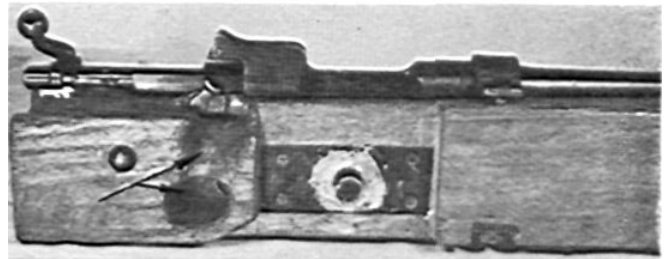


Figure 5—Notches in the block permit the rifle to be seated, and the bolt and trigger to be operated.

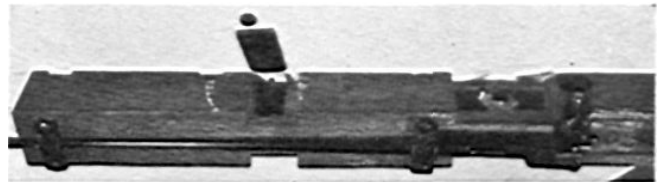
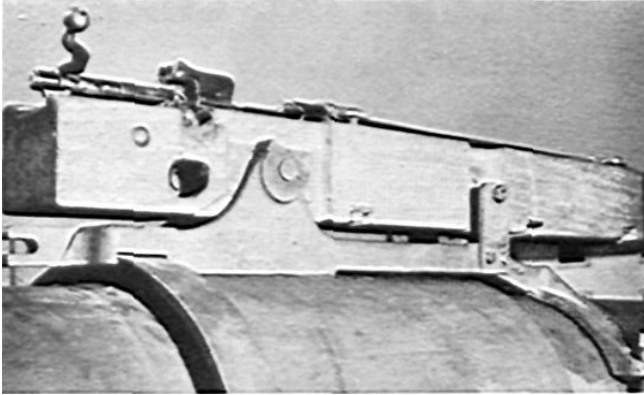


Figure 6—To strengthen the mount at the point of greatest stress, a metal plate 4"  $\times$   $2\frac{1}{4}$ "  $\times$   $\frac{3}{16}$ " is placed at the rear of the rifle breech. This is secured by  $\frac{3}{8}$ "  $\times$   $4\frac{1}{2}$ " carriage bolts passing through the block.





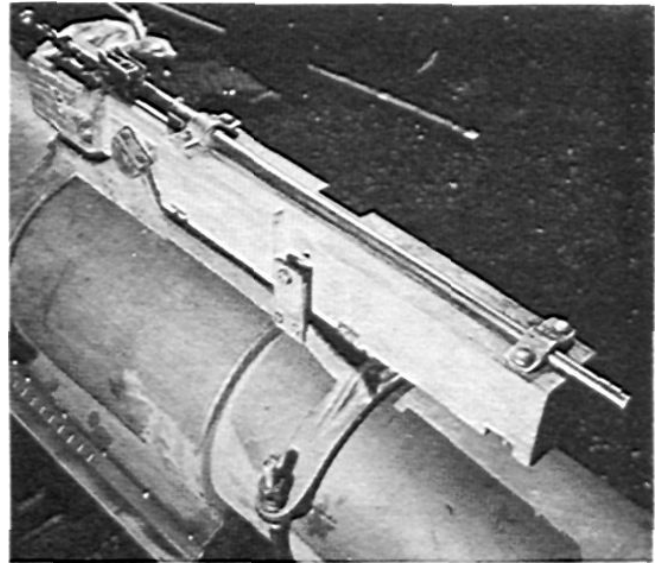
was developed so that the rammers could function normally in loading. With this arrangement the gun crews were trained simultaneously with the officers firing. Due to the close proximity of the pieces the executive was able to supervise the work of the crews closely, and in turn develop the "feel" of his four guns that is possible with lighter calibers that are tactically employed at closer intervals in the field.

On the miniature range the firing was conducted at ranges of around 1,000 yards, with some practice at 400 yards. The guns were placed in position on a small rise and fired against a hill whose slope in the target area varied from 10° to 20°. To produce a natural and realistic burst effect, the impact area was cleared of vegetation, and a loose dust mulch was created by working the soil with a road grader. Target materials used were boxes, cans, discarded oil drums, etc., arranged to simulate actual targets as encountered in the field.

For the conduct of fire the factor of 10 yards on the ground to 100 yards was used; thus an actual range of 1,000 yards gave

the effect of a range of 10,000 yards. This ratio of 1:10 was attained by pointing off one place in the announced quadrant and laying the guns to the nearest tenth of a mil. For example, an announced quadrant of 435 would be set off on the gunners quadrant at 43.5. The sheaf was handled in the normal manner after it had been corrected for the gun interval during the calibration preceding the service practice.

OPs were located at various points, permitting all types of artillery firing to be carried on from axial to large T and forward observation. Wire men and telephone operators also received training as wire communications were established at all times between OPs and the guns.



*T. Tang*

*W. H. McPherson*

*G. A. Magruder, Jr.*

*D. B. Lindsay*

*W. G. Coffman*

#### AWARDS OF ASSOCIATION MEDALS

Recognition is given by the U. S. Field Artillery Association to those R.O.T.C. cadets who best exemplify, in outstanding soldierly characteristics, the high standards of the arm. We extend heartiest congratulations to these young men:

Cadet Colonel Warren G. Coffman, University of Missouri; honor graduate; member Alpha Gamma Sigma.

Cadet Lieutenant David B. Lindsay, Purdue University; member Delta Tau Delta, Men's Glee Club, R.O.T.C. Pistol Team.

Cadet Master Sergeant Guy Archer Magruder, Jr., University of Missouri; member Phi Eta Sigma (honorary scholastic).

Cadet William H. McPherson, Stanford University.

Cadet Sergeant Thomas Tang, University of Santa Clara; member Sabre Society (honorary military); vice-president Alpha Sigma Nu (national honorary).

# TIME FIRE AND THE OBSERVED FIRE CHART

By Maj. Roger Wilco

So much is being written regarding time fire adjustment, effect, corrections, and so on that the impression is given that there is something difficult about time fire. It's about as difficult as common sense—often preached, seldom practiced.

Forward observer methods with time fire adjustments? Simple! If the FO wants time fire, he includes that request in his initial sensings. Sensings? Grazes are sensed as such; air bursts as "air," "zero air," or not sensed at all. No sensing of height of burst indicates that no change is desired. If no deflection change is desired, deflection is not sensed—so why not do the same for height of burst?

Action of the computer at battery or battalion FDC: make site changes of 10 mils until a sensing in the opposite sense is obtained. For example, if the initial sensing was "Graze," the computer commands "U 10," and continues to raise the site by 10 mils jumps until a sensing of "Air" is obtained. When this sensing is received site changes of only 5 mils are made as before, until a sensing in the opposite sense is received. After this 2 or 3 mils site changes are made. Generally 3 or 4 rounds will give either a zero height of burst or correct height of burst. The computer modifies this procedure only if the sensing "Zero air" is received. In this case, site is raised by 15/R.

Experience has shown that it is quicker and more reliable to teach computers rule-of-thumb changes to be made based on the observer's sensings than it is to follow a more complicated system of sensing height of burst in yards and differences in elevation of target and base point. Keep it simple and it will work. If a computer can handle firing as well as the executive or observer, he won't be with you long—he'll be on his way to OCS, so don't depend on having 3 Ph.D.s in Engineering for your computers.

There is another aspect to time fire which is often ignored. When setting up an observed fire chart, many battalions register with M48 fuze or M54 set for impact. Later, a few time fire problems are shot. Often difficulty is experienced in getting a proper height of burst in the first few rounds, particularly when firing battalion concentrations based on the adjustment of one battery or piece. This is easily understood. The registration did not tell you anything about the correct time setting or height of burst for that base point.

Let us start the registration over again, only this time use fuze M54 with time of burning as read from the firing tables for the range fired, and with site 300. The observer seeks to obtain a

zero air burst on the base point. When base deflection is recorded, the site has changed, let us say, to 309. The battery reports its adjusted range as the range corresponding to the adjusted *elevation*, and also a "base site" of 309. The site of 309 is a site for the day for that battery in that position, until reregistration occurs. Other batteries will have different sites. Each battery will fire its initial round on a target—regardless of fuze—at the elevation corresponding to the range desired, and *always* with its "Base site." If fuze M48 is used, site changes are *never* made; if fuze M54 is used, site changes to alter height of burst will be made based on observer's sensings. Targets are always plotted from the range corresponding to the elevation used, site is never included. A notation of the site can be made on the observed fire chart or on a record of missions fired.

What has been accomplished? A "time of burning correction" (often termed "corrector for the day") has been shot in by site changes. The height of burst has been brought to ground level at the base point. Initial rounds on a new target will, in general, be low airs or grazes close to the surface; usually one site change will result in effective height of burst. Battalion concentrations following adjustment by one battery can be fired with assurance that bursts will be close to a proper height of burst.

Proper height of burst for non-adjusting batteries can be easily obtained. The adjusting battery (or its computer) when reporting the corrections, also gave a site correction; for example, the base site of this battery was 309, after adjustment the site was 313, so correction is plus 4. The other two batteries added 4 mils to their adjusted base point site (which will usually be different for each battery) and thus brought their bursts to the same height as those of the adjusting battery.

The observed fire chart so constructed also represents a truer relation of batteries and targets, as BP ranges are horizontal ranges (not necessarily *distances*), and site enters the picture only as a base site for each battery. The observed fire chart should then differ from a firing chart only by a weather and survey K. Repeated firing has shown the efficiency of this method of registration using an observed fire chart. Over 90% of all our battalion concentrations so fired, after adjustment by one battery, have had an approximately correct height of burst; about 99% have had an effective height of burst. In all cases, all bursts of the battalion were at approximately the same height above the ground, thus facilitating rapid correction.

## SOLUTION TO PRACTICE PROBLEM (page 663)

1.  $3313 + \frac{500}{5.9} = 3398.$

2. East.

3. Right rear.

4.  $3714 - 3398 = 316.$

5.  $\frac{1/10 \times 316}{5.9} = 5.$

6.  $\frac{1/10 \times 316}{1.5} = 21.$

7.  $1.5/5.9 = .25.$

8. Either small t or large T.

9. r/R if small t is used.

c/d if large t is used.

# GUADALCANAL CHANTEY

Words by CAPT. LINCOLN STODDARD  
and CAPT. HENRI BOURNEUF

Moderato

1. From the bomb-er strip at Lun-ga To Mt.  
2. In - to trench-es al - most night-ly To the  
3. Drink-ing wa - ter out of mud-holes Wip - ing  
4. Sweep-ing west-ward through the palm groves 'Round Bo-

Aust-en's blood - y knoll, 'Cross the ridg - es down to Ko - kum - bo - na Bay \_\_\_\_\_ Dodg-ing Ze - ros in from  
ack - ack's throat - y growl, Old Char - lie whin - ing faint - ly o - ver - head, \_\_\_\_\_ In fox - holes packed so  
sweat from burn - ing eyes, Wear - ing greens that just as well might walk a - lone; \_\_\_\_\_ Cold at night in mould - y  
ni - na's wreck - strewn shore As our sol - diers make the yel - low bast - ards pay, \_\_\_\_\_ Kill - ing snip - ers lashed to

Mun - da As the Grum - mans take their toll, And their dron - ing says the Japs have had their day. \_\_\_\_\_  
tight - ly As the guard re - turns the howl And the si -rens give us all "Con - di - tion Red." \_\_\_\_\_  
bed - rolls With a sun that will not rise, As the death - stench ming - les with the bot - flies drone. \_\_\_\_\_  
tree - tops As the Gar - ands sharp - ly roar Where the Yanks have come they damn well mean to stay!

CHORUS

Out of the jun - gles down to the sea Blast - ing a way for the In - fant - ry,

Death rides a - gain for the Nip - pon - ee. Boom Boom Boom.

# ROUTES INTO EUROPE

## *A Study in Terrain*

### PART IV—THE BALKAN PENINSULA

By Col. Conrad H. Lanza

#### PENINSULA AS A WHOLE

The Balkan Peninsula is commonly defined as being that territory which is bounded on the east by the Adriatic Sea, on the south by the Mediterranean, on the west by the Aegean and Black Seas, and on the north by the Danube and Sava Rivers. It includes Greece, Albania, Yugoslavia, Bulgaria, and Turkey-in-Europe. Romania is not a part of the Balkan Peninsula, but its history and connections are bound so tightly with the Balkan nations that it is usually considered in discussions of Balkan matters.

Inhabitants of the Balkans belong to different races who in two thousand years of recorded history have never had a common interest. They have been constantly antagonistic to one another, although they have occasionally united when some common enemy presented himself. The last such instance was in 1912, when all joined to fight Turkey. Immediately after the emergency had disappeared they recommenced their interminable squabbles. The antipathy among the various Balkan

nations and states is due to differences in race, religion, and languages.

Boundaries and areas have varied at frequent intervals. No arrangement has ever been made which satisfied even a majority of the peoples involved. Usually all were dissatisfied, and every settlement served as a base for new grievances.

The *Greeks* are the oldest existing race in the Balkans. Ethnologically they belong to the same race as the original inhabitants of Italy. They have their own language and system of writing, and belong to an independent branch of the Orthodox Church. They inhabit modern Greece, including the Aegean Islands. There used to be a large number of Greeks in Asia Minor—over two millions of them. In 1920, following the war with Turkey, an exchange of populations was arranged whereby the Greeks in Turkish territory were evacuated to Greece in exchange for a much smaller number of Turks in Greece. A considerable number of Greeks still remain around Istanbul,

some along the Black Sea coasts of Bulgaria and Turkey, and some on Cypress. Greeks are predominantly a trading and seafaring people.

*Albanians* are of the same race as the Greeks, but speak a different language. They occupy their own country, with strong contingents in Greece (including some of the Aegean Islands) and smaller groups in Yugoslavia, where they are a dissatisfied minority.

Until 1913 Albania had led a tribal life for centuries. The country was ruled by numerous small chieftains who nominally owed an allegiance to Turkey but who were practically independent. Each chief ruled a clan. Clans fought each other in an unceasing minor warfare. Efforts (commencing early in 1914) to establish an Albanian kingdom have failed, there being no local demand for an independent, separate state. The majority of the people are Mohammedans; the balance are divided between the Orthodox and the Roman Catholic religions. This triple division is a source of discord. Albanians are a warlike people of excellent fighters.

*The Bulgarians* (or *Bulgars*) are of Tartar origin and first settled in what is now Bulgaria in the 5th Century. Thereafter they lost all connection with other Tartar races and with many Tartar customs. Now they use the Russian



alphabet and the Greek Orthodox religion. They are very vigorous people who have remained intact through endless wars. They are devoted to agriculture, the larger part of the peasants owning their farms. In addition to their state, considerable numbers of Bulgars inhabit northern Greece and southern Yugoslavia. Smaller numbers are to be found in Romania's Dobruja Province.

The *Serbs*, *Croats*, and *Slovenes* are three Slav races, united only since 1919 to form Yugoslavia. The Serbs outnumber the Croats and Slovenes combined. They use the Russian alphabet and belong to the Orthodox Church. They are essentially a rural people. Croats and Slovenes speak languages differing from Serbian, use the Latin alphabet, and belong to the Roman Catholic Church. They consider themselves culturally superior to the Serbs. There is considerable antagonism between the Croats and Slovenes, on one side, and the Serbs on the other. *Montenegrins* are a small tribe of Slavs who were independent until they were included in Yugoslavia in 1919. They have resented it ever since.

The *Romanians*, as their name indicates, are the descendants of Roman colonists. They have preserved their Latin language and many of their ancient customs. Literature and habits resemble those of other Latin nations. The dress usually worn by the peasants today is the same as that shown on the ancient monuments of Rome as being worn then by colonists. Their religion is a branch of the Orthodox Church. In addition to occupying Romania, which lies between the Carpathians on the north and the Danube on the south, large numbers reside in Bessarabia, other strong contingents (known locally as Vlachs) are in mountain areas of Greece, despised and disliked by the Greeks, and still others are scattered through Yugoslavia. While the majority of Romanians are engaged in agriculture, there is a well developed industrial section.

Excepting Albania, each Balkan state desires to expand its territories so as to include within its boundaries all its present outlying peoples. Greece has made the greatest progress in this direction, through exchanging populations with the Turks. Romania has initiated with the Hungarians a similar exchange of peoples in Transylvania. It has a problem with the Russians who have settled in Bessarabia in large numbers: the Russians seized this territory in 1940 and started to expel the Romanians; this move was uncompleted when the present war with Russia started in 1941.

The *Turks* occupy only a small part of the Balkan Peninsula. It is an important part, however, as it includes Istanbul and the straits of Dardanelles and Bosphorus. A small number of Turks are scattered through the Balkan states, other than Greece, but they are declining in numbers and withdrawing to Turkey-in-Asia as opportunity offers. The Turks are a Mongolian people and until recently were Mohammedans. Nominally they still belong to that church, but in practice have abandoned their former strong religious fanaticism. They have their own language, and until 1920 used the Arabic alphabet. Now they use the Latin alphabet and have modernized themselves considerably, discarding the well-known Turkish costumes, the veil for women, and other similar customs to which they had long adhered.

#### GREECE

Greece is the Roman name for this country. The Greeks call themselves Hellenes, and their own country Hellas.

Greece has a complex contour and a unique coast line. Except in the north, no part of the country is more than 50 miles from the sea. An approaching invasion force will see rocks and mountains everywhere, gray or brown and denuded of vegetation. Coming closer, a better view discloses precipitous cliffs behind which is a confused mass of hills and mountains. The coast has innumerable indentations, but the number of harbors is limited and the places where a large military force could debark are fewer still.

Mountains cover 80% of the country and extend in all directions. There are few plains suitable for military movements; these are basins surrounded by mountains and reached only through deep and narrow valleys. There is not a navigable river; most of the "rivers" are mountain torrents which may indeed have a heavy flow of water after a storm but which in general have no water or very little. The mountains are arid and covered with stones and rocks rather than soil. Consequently, when it rains the water runs off at a prodigious rate. Slopes are habitually steep and rough.

There are few beaches along the coast: the mountains either come down to the sea (into which they jut out as promontories or capes) or are separated from it by small plains. The seaward side of the mountains is steep.

In the Greek peninsula the mountain system centers around the Pindus Mountains, which are unusually rough and a serious military obstacle. They start in Yugoslavia and extend southward in about the center of Greece. They separate Thessaly on the east from Epirus on the west. Near the north Greek boundary they exceed 6,890 feet in altitude. They then decline in height to 4,000 to 5,000 feet as far as the line Gulf of Arta — Gulf of Lamia. They then rise again to Mount Vardusia (7,715'), Mt. Giona, the highest in this part of Greece (8,340'), and Mt. Parnassus (also over 8,000 feet).

Near where the Pindus Mountains pass the north Greek boundary another range crosses them at nearly right angles, separating Greece proper on the south from Macedonia and Albania on the north. These are the Cambunian Mountains. West of the Pindus they do not form an important obstacle. East of the Pindus the mountains increase in height until at the coast of the Gulf of Salonika they culminate in Mt. Olympus (9,750' altitude). They then turn southwest, following the coast through Mts. Ossa and Pelion (6,400 and 5,310 feet, respectively) and shutting the Thessalian plain in from the sea.

At the south end of the Pindus, at Mt. Vardusia, other chains start out in several directions. One to the southeast forms the backbone of the Attica peninsula, on which Athens is located. Another going east arrives at Thermopylae, on the south side of the Gulf of Lamia. Between this chain and the one to Attica lies the Kopais plain. West from Mt. Vardusia is another chain parallel to the Gulf of Corinth. A little north of Mt. Vardusia, the Othrys Mountains extend eastward to the north side of the Gulf of Lamia.

All of these mountains are passable by troops, although their passes are few and are liable to be well guarded. Trails exist across the mountains for which guides are generally required. Except during the autumn and winter there may be no water in the mountains. Snow may be an obstacle in the higher altitudes.

The south part of Greece, known as the Peloponnesus or Morea, is detached from the north section by the Gulf of

Corinth and the Gulf of Aegina. An isthmus  $3\frac{1}{2}$  miles wide connects the two parts.

Greece is very hot in summer, especially during the latter part. Winters are mild except in the mountains, where snow occurs from October to June. The rainy months are November, December, and January. Fogs and mists are unknown, so visibility is generally excellent, the country being bathed in sunlight.

Greece is naturally divided into the Peloponnesus (or Morea), East Central Greece, West Central Greece, and Macedonia.

#### *The Peloponnesus*

This peninsula is roughly 100 miles from north to south and 75 miles from west to east. Like the rest of Greece, it is very mountainous. The main stem of the mountains is parallel to and just south of the Gulf of Corinth and extends eastward into the peninsula of Argolis. The highest part of the chain is near its center, where altitudes exceed 7,700 feet.

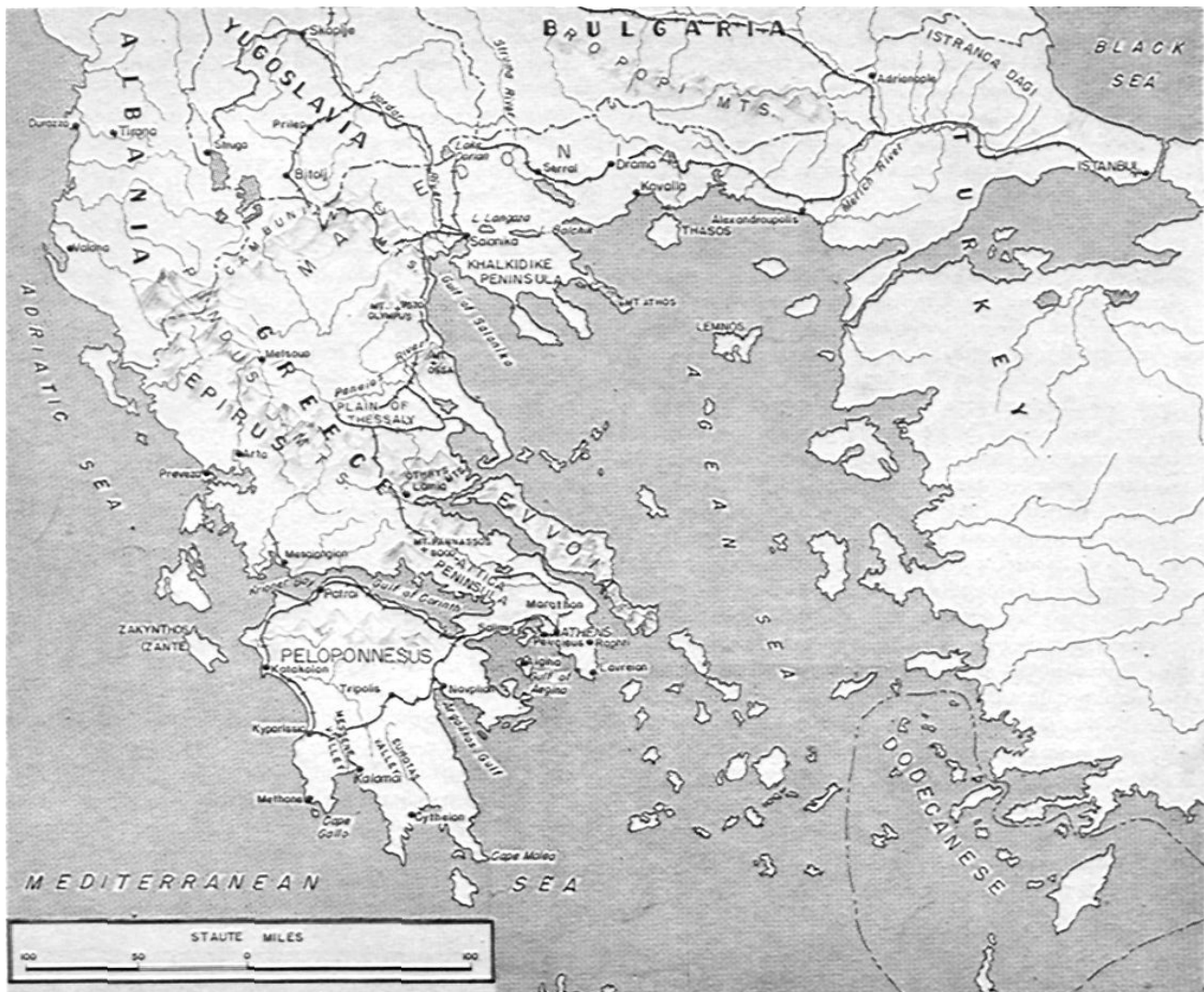
The center of the Peloponnesus is a high plateau encircled by mountains and reached from the seaboard through narrow passes. The east boundary of this plateau is the Malevo Mountains, whose altitudes exceed 6,000 feet and which

extend to Cape Malea. The west boundary is formed by the Pentadaktylon Mountains; their high point is Mt. St. Elias,\* with an altitude of 7,874 feet. Between these two chains of mountains is the Eurotas valley, which affords the best means of approach to the central plateau of Arcadia. There is a road up this valley but no railroad.

West of the Pentadaktylon Mountains is the Messene valley. There are both a road and a railroad up this valley to the Arcadian plateau, but near Psara (or Isara) they go through a difficult pass sometimes called Langada Pass. The railroad has steep grades and horseshoe curves in crossing the mountains and the road very steep grades.

West of the Messene valley is another mountain range, generally parallel to the west coast. The highest part of this chain is at the north end, Mt. Olonos (7,300'), from where the peaks gradually decline in height to around 3,000 feet at the south end, near Methone and Cape Gallo.

\*St. Elias and Olympus are very common names for mountains in Greece and the Near East. Mountains with these names will often be found within a few miles of each other. When mentioning these names in military papers, one must specify which of these is meant.



The two main towns of the Peloponnesus are Patrai (Patras) and Tripolis. Patras is a seaport, and the next in importance in Greece after Athens. Tripolis is a modern city nearly in the center of the peninsula; it is the logical place for enemy reserves, local headquarters, and airfields.

The Peloponnesus contains several possible landing places for invasion forces, which (with the exception of Patras) are of no importance in themselves and quite without resources. Patras, with a population of about 50,000, is a poor, unkempt town but with a magnificent harbor, ample for large convoys. Ships anchor off the coast, so troops and supplies must be debarked in barges. There are excellent stone quays, ample space for handling stores, and a railroad. Good warehouses are lacking, and billeting accommodations are poor. Good roads extend to the east and south. There is some level and cultivated area around Patras where troops can be assembled. Some 60 miles southwest from Patras is the island of Zakynthos (Zante). Between this island and the mainland is a roadstead in which ships can assemble.

Along the coast south of Patras are numerous beaches where landings could be made. Small ports exist at Katakolon and Kyparissia. On the south coast Kalamai, better known perhaps as Kalamata, is a small port, with adjacent beaches leading to the Messene valley. In the Eurotas valley is another small port of Gytheion, also with adjacent beaches. Both these valleys are narrow. The mountains approach the sea and defense positions are probably in rear of the beach—covering batteries which can effectively smother landing attempts. The mountains afford the defenders excellent OPs which, with the excellent visibility common in these areas, should enable the defense to locate targets and observe fire.

On the east coast of the Peloponnesus is the Argolikos Gulf, which contains a small but fine port at Nauplion. This lies in rear of a promontory jutting westward into the gulf from the east side. The port is completely protected from shelling by naval vessels, the promontory being 705 feet high and nearly precipitous.

Outside of the places mentioned there are no other ports, and few beaches suitable for landing considerable forces.

The enemy holds the Peloponnesus with Italian troops. Latest information is that there were three divisions present, exclusive of army reserves, if any. At least one division defends the Patras sector, and another the minor ports of Kalamata, Gytheion, and Nauplion. The third division is presumably in corps reserve near Tripolis, whence roads lead to all parts of the peninsula, no part being more than 75 miles away. Enemy air fields are on the Arcadia plateau.

No information has been received as to local defenses of ports. However, it must be expected that the enemy has paid attention to this and has erected the usual obstacles, including mine fields. The topographical nature of the country is such as to indicate that artillery would have a major part in defending the coasts.

#### *East Central Greece*

This area contains Athens, the Thermopylae sector, and Thessaly.

Athens is the most suitable place in Greece for a major base. Athens and its port of Peiraeus have grown into a single large city which had a million inhabitants. The port is small but well

equipped. In the roadstead outside, between the mainland and the island of Salamis, is ample sheltered water space for very large fleets. Warehouses were numerous and large in Peiraeus prior to April, 1940, when the explosion of an ammunition ship destroyed a large part of the harbor facilities.

The approach to Athens is defended by batteries on the islands of Salamis and Aigina on one side and by other batteries on the Attica peninsula. Aigina can be isolated by a superior air and naval power. Salamis is only about a mile off shore, and 100% interception of small craft bearing supplies and replacements would be difficult. Landings on Aigina are practicable on the west side only. Like other Greek islands, this one is mountainous, with almost precipitous slopes on three sides. Salamis has a rugged coast, but has a few small beaches on both east and west sides.

A forced landing in Peiraeus is not out of the question, if sufficient air and naval power is available. This method was successfully used by the Allies in 1916. The defense of Peiraeus and Athens, now a single city, rests on hills which surround it. There are a few low hills at the sea entrance of the harbor. West of the combined city is Mt. Aegaeos, 10 miles long, ascending to 1,250 feet, and with sharp slopes where it rises from the sea at the Strait of Salamis. There is a road or trail along the sea, and small parties could land there. This mountain has a flanking fire on the east side of Salamis, and vice versa. On the east side of Athens is a similar mountain—Mt. Hymette. This is higher, however, rising to 3,000 feet. These two mountains (east and west of Athens) are parallel and cover the city well. Both are barren and exposed to air observation.

Through Athens flow two rivers, the Kephisos and the Ilissos. Between the two rises another bare mountain, Tourko-Vouni, about 1,000 feet high. This dominates a great part of Athens proper. The famous Acropolis is on a detached eminence which originally separated Athens from Peiraeus. The Kephisos River used to have water in summer, something which no other river in this part of Greece has. Due to irrigation schemes further inland, this river in Athens is now dry in summer; neither river is a military obstacle.

There is very little information as to the defense of Athens. About two Italian divisions, forming a corps, are charged with the defense of the sector. Probably there are defenses within the city parallel to the sea coast. The main defense must lie in the above-mentioned hills which cover every part of Athens, at ranges from their summits of not exceeding 9,000 yards. The enemy's line of supply follows the Kephisos valley northward.

Land lines of communication from Athens to the Attica peninsula southeastward go around the north side of Mt. Hymette and approximately down the center of the peninsula, there being both a road and a railroad traversing a rather flat plateau at an elevation of some 300 feet but separated from the sea by hills on both sides.

On the south side of the peninsula there are a few small beaches suitable for detachments. Near the tip of the peninsula on the east is a small port, Lavreion, which has a large smelter. A better port exists at Raphti, 15 miles to the north; in 1940 it was used by the British as an embarkation point for withdrawing troops. Due to the narrow entrance of the harbor and the time required to move men—no materiel was

taken—a considerable number of ships were lost or damaged from enemy bombing.

Another 15 miles further north is the Gulf of Marathon, surrounded by about 7 miles of good beaches. By road it is 22 miles to Athens, but in an airline only about 16 miles. The plain of Marathon ( $\frac{1}{2}$  to  $1\frac{1}{2}$  miles wide) is at the north and center sectors of the gulf. About a third of the available landing places are obstructed by swamps either at the coast or at the foot of hills which rise steeply from the plain. These hills, from 800 to 1,500 feet high, afford good defensive positions. Valleys which lead inland are in the nature of gorges; among groves of trees they afford some cover for batteries covering the sea.

At the south end of the plain of Marathon is the isolated knoll of Soros, about 35 feet high and 180 feet in diameter. This is a noted landmark; it is an artificial mound erected in 490 B.C. to cover the remains of the men who died in the famous battle of that year.

The peninsula of Attica is thickly populated. Its soil is poor but figs, olives, and grapes are raised. The name in Greek means *rocky beach*, which is a correct description.

North of the Attica peninsula lies the plain of Kopais. Kopais used to be a "lake" which occasionally had water in it and at other times was an extensive swamp. It has now been drained and made into irrigated land, 320 feet above sea level. Drainage ditches lead into tunnels through hills toward the east, the water escaping to the sea by subterranean rifts. There are about 25 tunnels of appreciable size, known as the *katavothrae*, and innumerable small ones.

Approach to the Kopais plain is shut off by mountains on all sides. Access from the sea is dependent upon passing the narrow Straits of Khalkis opposite the center of Evvoia or going round the north end of Evvoia through the Oreos Channel. Both these routes are defended against sea approach. If either passage should be forced, best landing places are in the Gulf of Lamia and at Thermopylae Pass.

In ancient times the latter seems, from descriptions of the battle, to have been only about 50 feet wide from the base of steep hills to the sea. Now it is from  $1\frac{1}{2}$  to 3 miles wide, a flat and marshy plain but practicable to land upon. The increase in size has been explained as due partly to a rise in the coast of Greece and partly to earthquakes and alluvial deposits. The head of the Gulf of Lamia is very swampy but there are narrow beaches across the gulf from Thermopylae, which is the best place for landing parties. The term "pass" is now a misnomer.

Separated from the Gulf of Lamia by the Othrys Mountains is the plain of Thessaly. It is exceedingly fertile, being the bottom of a prehistoric lake. This plain is completely surrounded by mountains. By some cataclysm, the record of which has not come down to our times except in myths, an opening through these mountains into the sea was made along what is now the Peneios River. This opening is between Mounts Olympus on the north and Ossa on the south, in a deep, narrow cleft forming the celebrated Vale of Tempe. This is a  $4\frac{1}{2}$ -mile gorge through which the waters of the ancient lake escaped.

At the mouth of the Peneios are beaches where a landing could be made. A road and a railroad traverse the vale on the south side of the river. On the north side the rocks are cliffs, and there is no passageway. On the south side is a passageway

but the cliffs are higher, reaching to 1,500 feet above the vale. Owing to the length and narrowness of this defile it was supposed to be easily capable of defense, and several ancient lines of fortifications exist—yet it has been forced, and probably could be again. The river is broad and generally unfordable through the vale, with considerable vegetation along its banks which would cover defensive positions from air observation.

The plain of Thessaly is a suitable place for billeting troops, there being both numerous villages affording shelter and considerable food. Besides the Vale of Tempe there are two entrances into the plain across the Othrys Mountains from the south: the main road and the railroad. There are also several trails suitable for mountain troops, and which were used by the Germans to outflank the British positions which defended the main road.

At the northwest corner of Thessaly is the Zygos (or Metsovo) Pass, which leads into the Viosa valley of Albania. This is of considerable military importance, as it is one of the few lines available for crossing the Pindus Mountains and advancing from the east into Albania. It is understood that the enemy has improved the road through the Pass, which used to be poor, into a first class road uniting the Italian base at Valona on the Adriatic with northern Greece and thereby facilitating east-west movements of his forces.

Near the northeast end of Thessaly is the Meluna Pass which leads west of Mt. Olympus to Bitolj or Monastir. This is a main route and was followed by the Germans in 1940. After leaving the Vale of Tempe the railroad from Thessaly follows the coast to Salonika. German detachments of small size moved south along this route in 1940. It is exceedingly rough and at places very narrow. The Germans went around defiles by swimming through the sea. There are considerable woods along this side, whereas the passes are generally across barren country.

Troops attacking the passes can employ artillery and armored forces to advantage. Along the Mt. Olympus coastal defile, reliance must be placed more on light mortars. The Germans did find it possible to use tanks, however, but in each case it was for some special mission which was prepared for in advance.

Exclusive of troops in army reserve, the present garrison of Thessaly appears to be one Italian division which watches all of east central Greece.

#### *West Central Greece*

This area consists essentially of the south part of Epirus. Greece has claimed all of Epirus, which was part of ancient Greece. Now the northern and much of the central parts are inhabited by Albanians, who are Mohammedans and have shown no desire to be annexed to Greece. Attempts by various expeditions to arouse the natives to rise and seek annexation have all failed.

At the south end of this sector is the port of Messolongion, across the gulf from Patras. There is a good line of communication northward from here through the entire area, but the port is shallow and obstructed by sand banks. A better landing place is in the bay of Krioneri, about 8 miles to the east.

During the winter campaign of 1940-1941 the main Greek army operated in this sector with its front roughly along the north boundary of Greece. Supplies were forwarded by motor



transportation along the main road north from Messolongion, with an advanced base at Preveza. This entire sector is a mass of mountains extending in a generally north-south line, with deep valleys separating the numerous chains. Snow is deep in the mountains, and cold severe, from October to April. There are few transverse lines of communication. Consequently it is difficult to move troops or supplies in west and east directions.

The Greeks showed that the valleys could be defended by only holding the heights on the flanks, without deploying troops in the valleys. In this fighting machine guns and light artillery fired downward from the mountains. It was found practicable to use a few 150-mm howitzers. Only pack transportation could be used in the mountains, and in most cases mules had to be supplemented by human packers. The wastage of mules was very great, due in part to difficulty in providing forage for them during a winter. Trails could be developed in the mountains and it was possible to make attacks along the mountain ridges, provided proper artillery support was available.

If an invasion of this area is made, landings are practicable in the Gulf of Patras and near Preveza. Soon thereafter mountain warfare must be expected. Despite the trouble required, it will be safer to advance along the ridges rather than through the valleys. Every column must be self-supporting, as very little help can be expected from troops not immediately adjacent. All supplies must be imported.

There is no information available as to enemy preparations to defend this part of Greece.

#### *Macedonia*

Macedonia was acquired by Greece only in 1912. It lies on the north side of the Aegean Sea from the Gulf of Salonika (inclusive) on the west to the Merich River (the boundary with Turkey) on the east. Parallel to the Aegean coast and some 30 miles from it are the Rodopi Mountains, which form the north boundary. This territory was inhabited partly by Greeks and partly by Bulgarians, each claiming to form the majority and so leading to rival claims to this province. Since 1940 reports have arrived that a large number of Greeks have been forcibly evacuated from Macedonia, so perhaps now the population is predominantly Bulgarian.

The Aegean coast, although very irregular, has few good harbors. There are only three, evenly distributed in an air line at about 70-mile intervals. These are Salonika, Kavalla, and the mouth of the Merich.

Salonika, whose correct name is Thessalonike, is an excellent port and most suitable for a base. It has ample facilities for handling large ships. The port contains stone quays and can handle large volumes of freight. The city normally has about 100,000 people. A large part of its business is in the hands of Jews, who are descendants of the Spanish Jews forced out of Spain in the days of Columbus. They still speak Spanish, which is the commercial language.

From Salonika there are several important routes of advance into the interior.

The Vardar valley, with a good road and a railroad, leads northwards to Skoplje (or Uskub), about 125 miles away. This would be the first natural objective after Salonika is seized, for Skoplje is the junction for several main lines of communication. From here the main railroad leads to Nish and on through Yugoslavia to Belgrade. Another line of road and railroad extends from Skoplje into the Ibar valley. In 1940 this

railroad did not extend north of the old boundary of Novi-Bazar, although there is no engineering difficulty against building it through to Kraljevok where connection would be made with the main Yugoslav railroad system. Political reasons prevented the opening of this road. Such a line would be of advantage to the enemy and the possibility of this route being now open (or about to be opened) should be considered. Both these routes north out of Skoplje have numerous good defensive positions.

From Skoplje there is a railroad and road southeast to Struga near the border of Albania. At this point it connects with the Egnatia road, a military highway constructed by the Romans and extending from Durazzo, through Tirana and Struga, to Bitolj (or Monastir) and Salonika; this is one of the few east-west lines of communication in this area. From Bitolj there is railroad communication direct to Salonika and northeast through Prilep to the Salonika-Skoplje railroad.

Salonika is reported as strongly held by the enemy. A German corps of 3 divisions is thought to be stationed there. Italian reserves in Greece and Bulgarian reserves to the east must be considered available to reinforce the regular garrison.

The defenses are known to include a series of coast fortifications on each side of the Gulf of Salonika to prevent any landings. Terrain favors the enemy. Just west of the city is the delta of the Vardar, habitually swampy and unsuitable for landing operations. South of the city is the Khalkidike peninsula, along the high ground of which are positions covering a few narrow beaches. The south end of this peninsula consists of three smaller peninsulas, each a strip of mountain connected with the main peninsula by a narrow isthmus. The more easterly of the three is Akte, the end of which is Mt. Athos, 6,670 feet high and the site of famous monasteries.

The north side of the Khalkidike is covered by Lakes Langaza and Bechik, substantial obstacles. A landing would be possible northeast of the Khalkidike, near the mouth of the Struma River. An advance direct on Salonika would encounter these lakes, which also have swamps on the north side to further restrict the space available for military operations.

The Struma River is not marshy at its mouth, but there are extensive swamps along its banks only 6 to 7 miles inland; these will constrict an advance to a relative small space. Rough hills separate the Struma valley from the two lakes. The first road across them is from Serrai (or Seres) to Salonika and is 30 miles inland. The railroad goes around the hills about 55 miles inland and passes between them and Lake Dorian in another constricted space.

A landing on the west side of the Gulf of Salonika is pinched between sea and mountains. At the north end of the mountains is the Vistritza River, a possible defensive line for the enemy, and if this is crossed there is a 30-mile line of swamps and affluents of the Vardar which would be a good defensive position.

In all the enemy has an excellent location, and according to numerous reports is taking advantage of fortifying the few spaces favorable for landings.

Salonika was the Allied base from 1916 to 1918. It was seized without opposition then and there was no opposition when the Germans took it in 1940.

Kavalla's location would seem to make it suitable for a landing, for there are beaches in the vicinity and the island of

Thasos protects the roadstead so that the bay could be used at any time. There are extensive swamps about 6 miles inland, obstructing the width of a valley leading to Drama, 20 miles inland, where the west-and-east railroad runs. Kavalla has no facilities for a base but would be useful in connection with an attack on Salonika.

The Merich valley is a wide avenue of approach around the east end of the Rodopi Mountains. There is a small port at Merich Bay and a road and railroad leading to the interior.

The Rodopi Mts. are unusually rough. East of the Vardar valley there is not a single road crossing into Bulgaria and but few trails. These were blocked, prior to 1940, by the Metaxas Line, which is a series of small permanent forts constructed by the Greeks. The Germans succeeded in overcoming two sets of these defenses, but were able to move only small forces through the two passes. Their success came from their main force, which turned the Rodopi Mountains by moving south in the Vardar valley.

For an invasion from the sea this maneuver must be reversed, by advancing up the Vardar and/or up the Merich valley. The Vardar valley is narrow, with numerous positions suitable for blocking it. The Merich valley is broad, however, and goes around the Rodopi Mts., affording a wide way right into the heart of Bulgaria. It has been a favorable route of invasion since most ancient times.

Close to the sea the Merich is swampy, thereby reducing the space available for landing. On the west side are two hill positions within 15 miles of the coast, suitable for defensive positions against an invasion from the south. The east side of the valley is open but is on Turkish soil. If Turkey remains neutral an advance up the west side is practicable, and once the hill positions are taken we would have fairly level country suitable for armored forces.

The valley extends north from the sea 75 miles to Adrianople, on the Turkish side. Here the valley makes a right-angle turn to run westward by a wide gap between the Rodopi Mts. in Bulgaria and the Istranca Dagi in Turkey, which are parallel to the Black Sea. The valley continues westward over 150 miles almost to Sofia.

In the Bay of Merich is the small port of Alexandroupolis (or Dede Agach), which has no facilities suitable for a base. A temporary base would have to be organized in case of invasion, and might well be on an island such as Lemnos.

A Bulgarian army, estimated as having at least 12 divisions, is reported in the Merich valley, with main body facing toward Adrianople. Its mission appears to be to prevent an offensive by Turkish troops already deployed on their side of the Merich. According to Turkish reports of May, 1943, German divisions were arriving to reinforce the Bulgarians. Of about 4 other Bulgarian divisions, 2 are reported in Macedonia, guarding the coast from the Salonika area (exclusive) to Alexandroupolis (inclusive). The remaining 2 divisions are suspected as being on interior duty to preserve order at home.

The enemy is in a position to reinforce the Bulgarians quickly. Motor roads have been constructed leading south from the Danube valley to the Merich valley. Over these about 5 Romanian divisions could be moved in time to reach the vicinity of Adrianople within a week. Within the same period of time, but using a different set of roads and the railroad, about 5 Italian divisions could be brought from Yugoslavia,

giving the enemy not less than 22 divisions in the Adrianople sector. This gives some idea of the importance the enemy places on guarding the Merich valley.

#### COMMENTS

The enemy is defending the Aegean Sea by a line of islands covering the south entrance, by a line of islands along the east side close to Asia Minor, and by holding Greece proper on the west side and Macedonia on the north. This position is a quadrilateral. A hostile force penetrating into the Aegean by forcing one side will find hostile air and naval bases on the remaining three sides.

The only entrance the Allies have to the Aegean is the south side, and this must be opened to permit invasion fleets to proceed further. As between the east and west sides of the Aegean it would be better to reduce the islands on the east side, rather than undertake the occupation of Greece on the west side. This east side promises to be easier to reduce and more difficult for the enemy to retake. If the east islands are captured they would, in view of the superior Allied air and naval power, seem to be at once available for bases for Allied use, with little chance of the enemy being able to interfere with them materially.

The Aegean Quadrilateral having been opened by occupying two sides (the south and the east), attack of the north side would be the next logical step. If this falls, the enemy might evacuate Greece proper to avoid having his troops therein surrounded. If the west side (that is, Greece) is attacked first, it will in no way interfere with the enemy's hold on Macedonia; in fact, it will give him just that much more time to prepare to defend it.

No plan for attacking Macedonia can be undertaken without considering the role of the Turkish army, reported as able to bring 30 divisions to the Adrianople sector. If Turkey joins the Allies a landing at the mouth of the Merich will be unnecessary, as troops can debark at Istanbul, Tekirdag on the north side of the Sea of Marmora (previously known as Rodoste), and at Gelibolu (Gallipoli).

If Turkey does not join the Allies but continues to remain neutral a landing on the west side of the Merich may still be necessary, but it will be a more difficult operation due to the lack of space for deploying large forces. In this case the main landing will have to be in the Salonika sector.

Due to the nature of the enemy's position around Salonika, which was discussed above, an attack on Salonika will have the best chance of success if landings are made on a wide front on both sides of Kavalla, at the mouth of the Struma, on the peninsulas and flanks of Khalkidike, and on the west side of the Gulf of Salonika. Troops landing at Kavalla must guard the right flank in strength if no landing has been made in the Merich valley. Troops landing on the west side of the Gulf of Salonika need to guard their rear and left. The 1940 campaign indicated that the narrow passage along the coast between Mt. Olympus and the sea could be held for several days by two battalions of infantry with three batteries, against any force that could be used. A reinforced regiment should be able to watch in this direction, and it might be sent to guard the exit from the Vale of Tempe. After moving north from the vicinity of Mt. Olympus a left flank guard will be needed, but the space is so limited (about 11 miles wide) that a large force will not be necessary.

Latest information is that the enemy, in addition to the Bulgarian 16 divisions, has an Italian Army with 10 divisions in Greece (south of Salonika) and 15 divisions in Yugoslavia, with 9 Romanian divisions in Romania. Six Italian divisions have been located in Greece. The remaining 4 are presumably in army reserve. There is no information as to their location but they might well be in the plain of Thessaly, and in this case could commence to arrive in the Salonika sector within 24 hours. Of 15 divisions reported in Yugoslavia, which may include Croat and Hungarian divisions, at least 5 seem to be the minimum required to maintain lines of communication and guard bases. This would leave 10 divisions available to send to either the Salonika or Merich sectors.

The number of German divisions in the south Balkans, outside of the 3 divisions at Salonika, is not known. The Germans have a considerable number of service troops in Bulgaria, handling numerous air fields and air bases. All the forces mentioned above are under a single commander, reported to be a German Marshal. His air forces at date of writing are small, but the facilities exist for flying in large air reinforcements when needed.

Coastal defenses erected by the Germans are, in general, not large concrete forts. The majority are small works holding from a squad to a platoon of infantry. They are disposed in great depth, reported as exceeding 10 miles in the Vardar and Merich valleys. There works are supplemented by an extensive system of obstacles which include mines in the waters opposite beaches, land mines in the beaches themselves and along likely lines of advance, steel and concrete antitank abatis, and arrangements for demolishing bridges and roads.

The main enemy forces are not in the defenses, which contain men, ammunition, water, and provisions for only a period not exceeding two or three days. Mission of the defenses is to delay and break up the invaders and enable the main Axis forces to counterattack under favorable circumstances, supporting themselves on the defenses where possible.

All indications are that the enemy intends to make a strong defense of the Balkans and its approach through the Aegean Quadrilateral.

# Field Artillery Units as of 14 July 1943

## SUMMARY

The following is a list of the organic Field Artillery within Divisions:

<i>Division</i>	<i>T/O</i>
<i>Airborne Division</i>	71
Division Artillery	6-200
Bn, Prcht, 75-mm Pk-How (1)	6-215
Bn, Glider, 75-mm Pk-How (2)	6-225
<i>Armored Division</i>	17
<i>Division Artillery Command</i>	6-160-1
Bn, Armd FA (3)	6-165
<i>Cavalry Division</i>	2
Division Artillery	6-110
Bn, 75-mm Field How, horse (2)	6-115
Bn, 105-mm How, Trk-Dr (1)	6-25
<i>Infantry Division</i>	7
Division Artillery	6-10
Bn, 105-mm How, Trk-Dr (3)	6-25
Bn, 155-mm How, Trk-Dr (1)	6-35
<i>Light Division</i>	72
Division Artillery	6-270
Bn, 75-mm How, Pk (3)	6-155
Bn, 75-mm Pk-How, Trk-Dr. (3)	6-175
(Bn, Antiaircraft (1))	(44-575)
Btry, Antitank (1)	6-197

## DETAILS

Undated tables are being revised; those marked \* have been completed, and are now being printed. It is not contemplated that dated tables will be revised.

<i>T/O and E</i>	<i>Briefed Title</i>
6-10*	Div Arty, Inf Div. Hq Med Det, Div Arty, Inf Div.
6-10-1*	Hq and Hq Btry, Div Arty, Inf Div.
6-12	Hq and Hq Btry, FA Group. Med Det, Hq and Hq Btry, FA Group.
6-25*	Bn, 105-mm How, Trk-Dr. Med Det, FA Bn, Mtz.
6-26*	Hq and Hq Btry, Bn, 105-mm How, Trk-Dr or Trac-Dr.
6-27*	Btry, 105-mm How, Trk-Dr.
6-29*	Serv Btry, Bn, 105-mm How, Trk-Dr.
6-35*	Bn, 155-mm How or 4.5-inch Gun, Trk-Dr. Med Det, FA Bn, Mtz.
6-36*	Hq and Hq Btry, Bn, 155-mm How or 4.5-inch Gun, Trk-Dr or Trac-Dr.
6-37*	Btry, 155-mm How or 4.5-inch Gun, Trk-Dr.
6-39*	Serv Btry, Bn, 155-mm How or 4.5-inch Gun, Trk-Dr.
6-45	Bn, 75-mm Gun, H-Dr (1 Apr 42). Med Det, 75-mm Gun Bn, H-Dr.
6-46	Hq and Hq Btry, Bn, 75-mm Gun, H-Dr or 75-mm Field How, horse (1 Apr 42).
T/BA 6, 1 July 42, w/6 changes	
6-47	Btry, 75-mm Gun, H-Dr.
T/BA 6, 1 July 42, w/6 changes	
6-49	Serv Btry, Trk-Dr, Bn, 75-mm Gun H-Dr or 75-mm Field How, horse (1 Apr 42).
T/BA 6, 1 July 42, w/6 changes	
6-50	FA Brig (1 Apr 42). Med Det, FA Brig.
6-50-1	Hq and Hq Btry, Corps Arty.
6-55	Bn, 155-mm Gun, Trk-Dr. Med. Det, FA Bn, Mtz.
6-56	Hq and Hq Btry, Bn, 155-mm Gun, 8-inch How, 240-mm How, M1918 Modified, Trk-Dr, Trac-Dr, or SP.
6-57	Btry, 155-mm Gun, Trk-Dr.
6-59	Serv Btry, Bn, 155-mm Gun, 8-inch How, or 240-mm How, M1918 Modified, Trk-Dr.
6-65	Bn, 8-inch How, Trk-Dr. Med Det, FA Bn, Mtz.
6-56	Hq and Hq Btry, Bn, 155-mm Gun, 8-inch How, 240-mm How, M1918 Modified, Trk-Dr, Trac-Dr, or SP.
6-67	Btry, 8-inch How, Trk-Dr.
6-59	Serv Btry, Bn, 155-mm Gun, 8-inch How, or 240-mm How, M1918 Modified, Trk-Dr.
6-75	FA Obsn Bn (Sound and Flash Ranging) (1 Apr 42). Med Det,

6-76	FA Bn, Mtz (1 Apr 42).
T/BA 6, 1 July 42, w/6 changes	Hq and Hq Btry, Obsn Bn (1 Apr 42).
6-77	Obsn Btry (1 Apr 42).
T/BA 6, 1 July 42, W/6 changes	
6-95	Bn, 240-mm How, M1918 Modified, Trk-Dr. Med. Det, FA Bn, Mtz.
6-56	Hq and Hq Btry, Bn, 155-mm Gun, 8-inch How, or 240-mm How, M1918 Modified, Trk-Dr, Trac-Dr, or SP.
6-97	Btry, 240-mm How, M1918 Modified, Trk-Dr.
6-59	Serv Btry, Bn, 155-mm Gun, 8-inch How, or 240-mm How, M1918 Modified, Trk-Dr.
6-110	Div Arty, Cav Div (1 Apr 42). Med Det, Div Arty, Cav Div (1 Apr 42).
6-110-1	Hq and Hq Btry, Cav Div Arty (1 Apr 42).
T/BA 6, 1 July 42, w/6 changes	
6-115	Bn, 75-mm Field How, horse (1 Apr 42). Med Det, Bn, 75-mm Field How, horse (1 Apr 42).
6-46	Hq and Hq Btry, Bn, 75-mm Gun, H-Dr or 75-mm Field How, horse (1 Apr 42).
T/BA 6, 1 July 42, w/6 changes	
6-117	Btry, 75-mm Field How, horse (1 Apr 42).
T/BA 6, 1 July 42, w/6 changes	
6-49	Serv Btry, Trk-Dr, Bn, 75-mm Gun, H-Dr or 75-mm Field How, horse (1 Apr 42).
T/BA 6, 1 July 42, w/6 changes	
6-125 (24 Apr 43)	Bn, 155-mm Gun, SP.
6-25-M (1 Mar 43)	Med Det, FA Bn.
6-126 (24 Apr 43)	Hq and Hq and Serv Btry, Bn, 155-mm Gun, SP.
6-127 (24 Apr 43)	Btry, 155-mm Gun, SP.
To be revised under the following tables:	
6-125	Bn, 155-mm Gun, SP. Med Det, FA Bn, Mtz.
6-56	Hq and Hq Btry, Bn, 155-mm Gun, 8-inch How, or 240-mm How, M1918 Modified, Trk-Dr, Trac-Dr, or SP.
6-127	Btry, 155-mm Gun, SP.
6-129	Serv Btry, Bn, 155-mm Gun, SP.
6-145 <sup>†</sup>	Bn, 240-mm How, M1918, Trac-Dr (How in 4 loads—Hv Trac M1) (1 Apr 42). Med Det, FA Bn, Mtz (1 Apr 42).
6-26	Hq and Hq Btry, Bn, Mtz.
T/BA 6, 1 July 42, w/6 changes	
6-147	Btry, 240-mm How, Mtz (1 Apr 42).
6-59	Serv Btry, Bn, 155-mm Gun or 240-mm How, M1918, Mtz.
T/BA 6, 1 July 42, w/6 changes	
<sup>†</sup> This Bn will be superseded by T/O 6-95 and T/O 6-395.	
6-150	Div Arty, Mtn Div (1 Apr 42). Med Det, Div Arty, Mtn Div (1 Apr 42).
6-150-1	Hq and Hq Btry, Div Arty, Mtn Div (1 Apr 42).
T/BA 6, 1 July 42, w/6 changes	
6-155	Bn, 75-mm How, Pk. Med Det, Bn, 75-mm How, Pk.
6-156	Hq and Hq and Serv Btry, Bn, 75-mm How, Pk.
6-157	Btry, 75-mm How, Pk.
6-160-1	Hq, Div Arty Comd, Armd Div.
6-165	Bn, Armd FA. Med Det, Armd FA Bn.
6-166	Hq and Hq Btry, Bn, Armd FA.
6-167	Btry, Armd FA.
6-169	Serv Btry, Bn, Armd FA.
6-175	Bn, 75-mm Pk-How, Trk-Dr. Med Det, 75-mm Pk-How, Bn, Trk-Dr.
6-176	Hq and Hq and Serv Btry, Bn, 75-mm, Pk-How, Trk-Dr.
6-177	Btry, 75-mm Pk-How, Trk-Dr.
6-197	AT Btry L. Div (proposed).

6-200	Div Arty, Airborne Div. Med Det, Div Arty, Airborne Div (includes equipment for Div Hq Det and all Bn Dets).	6-36	Hq and Hq Btry, Bn, 155-mm How or 4.5-inch Gun, Trk-Dr or Trac-Dr.
6-200-1	Hq and Hq Btry, Div Arty, Airborne Div.	6-337	Btry, 155-mm How or 4.5-inch Gun, Trac-Dr.
6-212	Hq and Hq Btry, Airborne, FA Group.	6-339	Serv Btry, Bn, 155-mm How or 4.5-inch Gun, Trac-Dr.
6-215	Bn, 75-mm Pk How, Prcht. Med Det, Prcht Bn, 75-mm Pk-How.	6-355	Bn, 155-mm Gun, Trac-Dr. Med Det, FA Bn, Mtz.
6-216	Hq and Hq and Serv Btry, Prcht Bn, 75-mm Pk-How.	6-56	Hq and Hq Btry, Bn, 155-mm Gun, 8-inch How, or 240-mm How, M1918 Modified, Trk-Dr, Trac-Dr, or SP.
6-217	Btry, 75-mm Pk-How, Prcht.	6-357	Btry, 155-mm Gun, Trac-Dr.
6-218	AA and AT Btry, Prcht Bn.	6-359	Serv Btry, Bn, 155-mm Gun, 8-inch How, or 240-mm How, M1918 Modified, Trac-Dr.
6-225	Bn, 75-mm Pk-How, Glider. Med Det, Glider Bn, 75-mm Pk-How.	6-365	Bn, 8-inch How, Trac-Dr. Med Det, FA Bn, Mtz.
6-226	Hq and Hq and Serv Btry, Glider Bn, 75-mm Pk-How.	6-56	Hq and Hq Btry, Bn, 155-mm Gun, 8-inch How, or 240-mm How, M1918 Modified, Trk-Dr, Trac-Dr, or SP.
6-227	Btry, 75-mm Pk-How, Glider.	6-367	Btry, 8-inch How, Trac-Dr.
6-270	Div Arty, L Div. Med Det, Div Arty, L Div.	6-359	Serv Btry, Bn, 155-mm Gun, 8-inch How, or 240-mm How, M1918 Modified, Trac-Dr.
6-270-1	Hq and Hq Det, Div Arty, L Div.	6-395	Bn, 240-mm How, M1918 Modified, Trac-Dr. Med Det, FA Bn, Mtz.
6-325	Bn, 105-mm How, Trac-Dr. Med Det, FA Bn, Mtz.	6-56	Hq and Hq Btry, Bn, 155-mm Gun, 8-inch How, or 240-mm How, M1918 Modified, Trk-Dr, Trac-Dr, or SP.
6-26	Hq and Hq Btry, Bn, 105-mm How, Trk-Dr or Trac-Dr.	6-397	Btry, 240-mm How, M1918 Modified, Trac-Dr.
6-327	Btry, 105-mm How, Trac-Dr.	6-359	Serv Btry, Bn, 155-mm Gun, 8-inch How, or 240-mm How, M1918 Modified, Trac-Dr.
6-329	Serv Btry, Bn, 105-mm How, Trac-Dr.		
6-335	Bn, 155-mm How or 4.5-inch Gun, Trac-Dr. Med Det, FA Bn, Mtz.		

## FIRE DIRECTION AID

By Capt. F. W. Duff, FA

In the North African Campaign we found that the fire direction center of an armored artillery battalion was slowed by the standard TBA equipment of a range deflection fan and L-square whose scales were 1/20,000. Scales of all maps of the area were a multiple of 1/25,000, and furthermore were gridded in the metric scale. Having been trained to think in terms of the yard and a scale of 1/20,000, valuable time was being lost at the FDC in placing the initial round on the ground. Also, numerous missions were requested in which only coordinates from a 1/25,000 map (or multiple thereof) were used. In mobile artillery with fluid front lines, an observer may not (and often can not) locate a target by a base point shift. Another factor leading to use of coordinates rather than a base point shift, was that all observers might not (and often did not) observe the base point registration. This is particularly true of observers who are not field artillerymen, but who may be tank commanders or tank reconnaissance officers.

After a few engagements with the enemy, running from map to firing chart (by running I literally mean running, as there are times when they must be separated for air security and communication purposes), much thought was given toward developing a method of determining the initial data (except site) from the 1/20,000 firing chart, even though a target might be designated by coordinates from a map which was to the scale of 1/25,000 (or multiple thereof) and which was gridded in the metric scale.

Our first tentative solution was to change the firing chart to a scale of 1/25,000, but this was discarded since it would necessitate pasting strips along the sides of the range deflection fan and L-square. Also, there would be no quick method for locating a point designated by coordinates on the firing chart. The last-mentioned reason was of prime importance.

We then tried making a grid on a transparent map covering over which the firing chart could be superimposed, and from which the Y-

azimuth and range to any grid intersection or any point located by coordinates (based on 1/25,000 scale, or multiple thereof, and meters) could be read directly with the 1/20,000 deflection fan, so that every deflection shift could be a base deflection shift.

By experimentation on a firing chart which had been used previously, the size of the grid was determined. Various coordinates were located on the firing chart by deflection and range data from a 1/50,000 map. By dividing the distance between two points on the firing chart into the same number of parts as the same points were apart on the 1/50,000 map, the size of the grid was determined. Proper size of the grid was found to be 1,093.6 yards on a side, when scaled with a 1/20,000 scale (1,000 meters being 1,093.6 yards). By dividing the side of the grid into 10 parts and pasting the scale on an L-square, any given coordinates can be located on the firing chart.

This special grid is ruled on transparent map covering which is placed over a plain sheet of paper on the plane table. A sheet of tracing paper placed over the grid is used as the firing chart. The grid is numbered corresponding to the area in which operations are taking place. If it is desired to have the Base Point—Center Battery line lengthwise of the paper, the grid can be turned until it is oriented after the adjusted data from a battery has been received.

If the batteries are surveyed in previous to firing, the gridded firing chart can be set up from the survey.

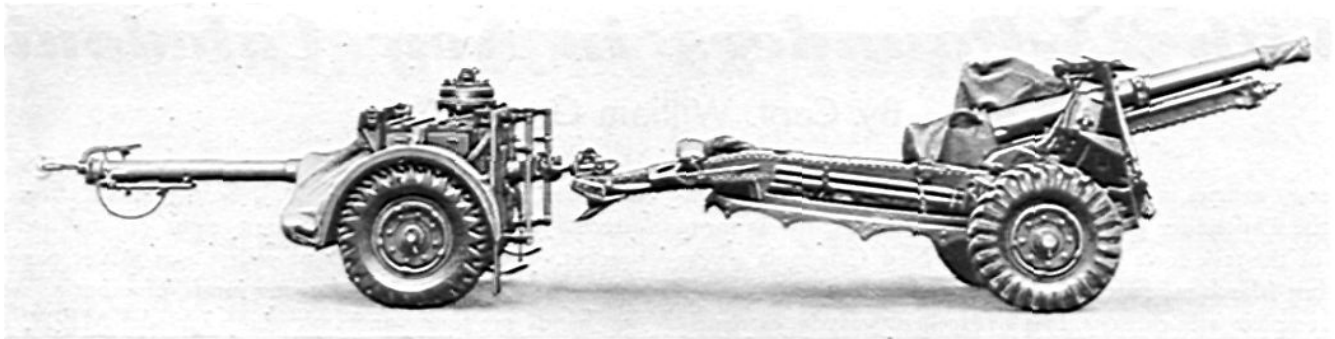
On the firing chart, if a target is designated by "Base point is (so much right or left) and (so much over or short)," an ordinary 1/20,000 L-square is used. If the target is located by coordinates, the L-square which is 1,093.6 yards on a side is used.

This fire direction aid has helped in the delivery of initial rounds, and also can be read with greater accuracy than a 1/50,000 or 1/100,000 map. When time is available plain white paper can be gridded so a supply of gridded sheets will be on hand.

### GRID LINES TOO FAR APART?

One day when Capt. E. J. Selbert was working on a grid sheet with the lines too far apart, he pointed out what a blessing it would be to have a 1:18,000 or 1:19,000 scale in place of one of the scales that is seldom used. Until such a change is made, get one of the flat scales which has yards on one side, meters on the other. The meter scale works fine, being about 1:18,288 in terms of yards.

—CAPT. R. F. CISELL, FA



## ***MORE ON THE 25-POUNDER***

By Maj.-Gen. Henry Rowan-Robinson  
C.B., C.M.G., D.S.O.

Artillery of the British Army is organized in regiments of horse, field, medium, antitank, antiaircraft, and coast artillery. The term "horse" is still used, although these units are now mechanized.

Horse and field regiments are organized in three batteries, each of two troops of four guns, thus numbering twenty-four guns in all. Horse regiments (of which there are two to each armored division) and field regiments (three to a division) are both armed with the 25-pounder. The shell of this gun weighs approximately eleven kilograms.

Equipment consists of gun, carriage, trailer, and tractor, the whole capable of a speed of 25 miles (40 kilometers) per hour over roads and 15 miles (24 kilometers) over easy country. Other details are:

Weight of piece	—about ½ ton (457 kg)
Weight of piece and carriage	—about 3700 lbs (1,677 kg)
Caliber	—3.45 inches (8.763 cm)
Weight of shell	—approximately 24¼ lbs

The piece contains a "loose barrel" which is protected for about half its length by a jacket. The barrel, whose life is around 10,000 rounds, can be changed on the spot in about thirty minutes.

A circular platform, the details of which can be seen in the accompanying illustration, is provided for the carriage. When traveling it is carried under the trail and is lowered to the ground when the gun is halted for action; the wheels of the carriage are hauled over the flange by the tractor before the gun is unhooked. This platform, provided with sharp projections which bite into the ground on firing, checks the recoil of the carriage by means of the firing stays. The whole system enables the carriage to be swung round the full circle of 360° in a

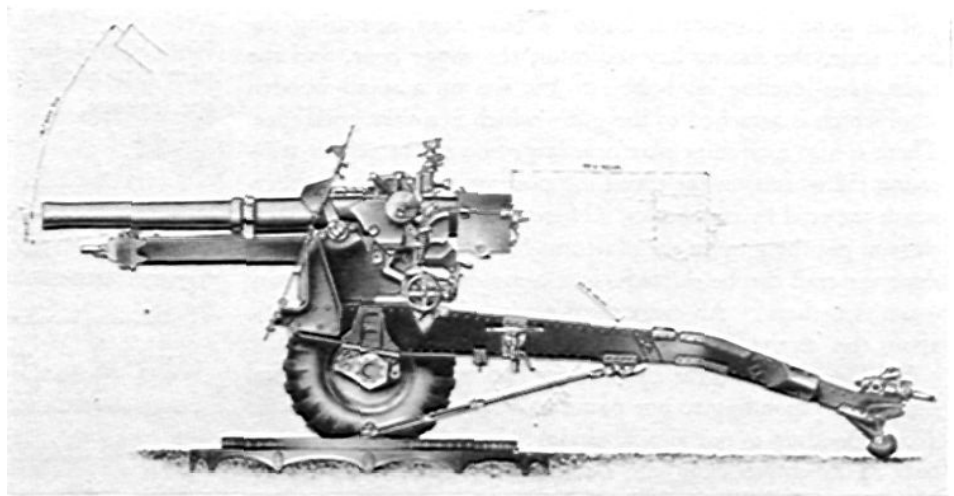
few seconds. Thanks to smooth recoil and recuperation, to the check applied by the platform, and to an efficient brake, the equipment is remarkably steady in action.

Four charges are available. The lowest gives a maximum range of 3,900 yards (3,566 meters) for a muzzle velocity of 650 feet (197.5 meters) per second, and the highest a range of 13,400 yards (12,152 meters) for a muzzle velocity of 1,700 feet (517.8 meters) per second; elevation in both cases is about 40°.

Projectiles are streamlined. High explosive shell is of normal type. The smoke shell is of the base-ejection type and particularly effective; it contains a bursting charge near the head of the projectile and, just below, three containers of smoke composition which (blown out of the base by the explosion) drop to the ground at a low velocity and burn at points roughly equi-distant from one another. For action against tanks there is a solid armor-piercing shot; and a chemical shell can be quickly made available should the enemy succumb to the temptation to use gas.

The principal fuze is the No. 119, which acts on graze or impact and has a high man-killing effect, mainly lateral, over a radius of some 200 yards (183 meters). If fired without removal of the cap, its action is slightly delayed and thus rendered effective against buildings and trenches.

No. 221—a powder-burning time-fuze—is used for smoke and chemical shell. No. 222 is a powder-burning, detonating time-fuze used with high explosive.



# With 25-Pounders in New Caledonia

By Capt. William Gray, FA

Recent articles in *THE FIELD ARTILLERY JOURNAL* concerning the 25-pounder gun especially interested us, for as members of the task force which landed in New Caledonia a year ago last March my battery was equipped with four 25-pounders, complete with caissons. It is an excellent weapon, extremely accurate, with little or no dispersion.

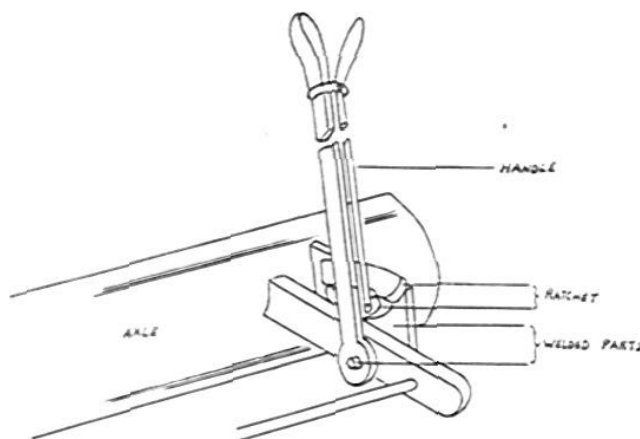


FIGURE 1 BRAKE MECHANISM

There are some outstanding features of this gun which are not found in any of our materiel. First, there is a drift scale on the gun itself which the gunner corporal operates. For each charge there is a corresponding index on the drift scale, which is set off as soon as the command "Charge" is given. This scale then automatically takes care of the drift.

The range cone is another excellent feature, with a calibration scale for each charge. When the charge is announced, the gunner corporal merely moves a sliding key indicator to the charge indicated on the calibration scale and turns the range cone to the correct range. This range cone is graduated in yards to the nearest 50; the thousand-yard graduation is indicated by a red line and the remaining graduations by black lines. The cone itself is divided into four sections (one for each charge) and is extremely easy to operate. We never used elevation or quadrant—always range.

This gunner corporal is indeed a busy man, operating the drift scale, the sliding key indicator, the range cone, and the sight, plus leveling his bubbles. He sits on a small wooden stool which is attached to the gun—which is a very good idea. There is also a circular platform large enough to permit traversing the wheels; in the travelling position it is latched underneath the trail by two hooks. There is a regular Notre Dame shift to get the gun on the platform for firing, but once this is done the trail can be shifted—in a complete circle if necessary—with one hand. All cannoneers are particularly enthusiastic about this, as the Chief of Section does all the trail shifting.

With apologies to the English, we had no love for their dial sight (corresponding to our panoramic sight) or their director (corresponding to our aiming circle). It did not seem right to hear an executive shouting "Base deflection left 15° 30', On

No. 1 open 5', "Right 2'" or "Aiming point this instrument, deflection right (left) 179° 45'." So my initial efforts were directed to mounting a panoramic sight on the dial sight bracket. The first problem of course was to get panoramic sights, but by begging, borrowing, and "promoting" we laid our hands on four panoramic sights, Model M1917, which were normally used on 155-mm howitzers. Sergeant Technician Leslie Green and his assistant, Pfc. Aubrey Childress, with the kind of assistance of the men and officers of the BLth Ord Co, evolved an improvised sight mount which was most satisfactory. We got hold of a piece of solid steel and cut it into four parts, each 2½" in diameter and 10" long. These sections were then honed down so that they fitted perfectly into the dial sight bracket holder. A "T" slot was cut out, and the sight fitted nicely.

Attached to the right wheel this gun had one brake handle which operated both wheel brakes simultaneously. It was felt that an independent brake system would facilitate jockeying the gun into position in difficult terrain, so our next effort was devoted to installing an independent brake system. We took the brake handle and ratchet off four Australian caissons and welded a flat ½" piece of iron to the axle on the left hand side of the gun, to which we bolted the ratchet and handle. A bolt ran through this handle to the brake shoe, completing the picture (Fig. 1).

Packing in the recoil system was our biggest problem. Initially we thought the packing was to hold the oil in the recoil system, but we discovered it actually guided the tell-tale rod (corresponding to the oil indicator in the 105-mm howitzer). On the inner end of the packing box in the recoil is a sealing valve composed of a brass U-shaped washer with small holes in it. A rubber U-shaped washer fits over the brass one. The oil escapes through these small holes on recoil, thus expanding the rubber washer against the tell-tale rod and preventing the oil from leaking out of the gun through the glands. This rubber washer was found to be much too short to fit snugly over the brass washer, so oil seeped out through the glands and the gun "leaked" every time we looked at it. This was solved by Green, Childress, and Co.'s obtaining a thin sheet of copper ½" wide and .008" thick. From this they made a washer (A) that fitted over the rubber U washer (B) (Fig. 2). When the oil passed through the small holes in the brass washer it first contacted this copper sheeting, which in turn expanded the rubber washer sufficiently. This stopped the leakage.

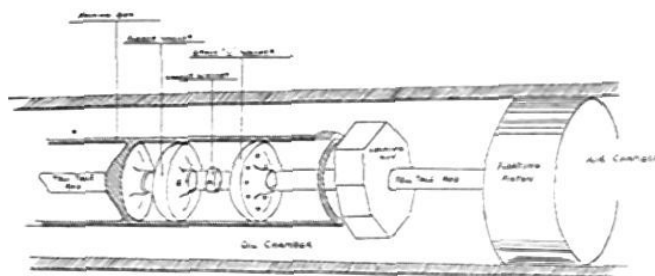


FIGURE 2 RECOIL MECHANISM

# RUNNING JUNGLE TRAVERSES

By Capt. Charles B. Foster, Jr., FA

It was with great interest that we noted the three articles in the February, 1943, FIELD ARTILLERY JOURNAL by Maj. H. E. Bisbort, Capt. C. R. Oliver, and Lt. Lauren D. Lampert, because a year and a half ago our battalion abandoned plotting of traverses and turned entirely to computing them mathematically. Our methods were worked out and tested in the thick woodland country of Mississippi and Louisiana, and now for the last year have been used in the thick jungle of an

connecting traverse, which is usually run by the battalion group.

For keeping notes of the aiming circle traverse we use Form No. 1, which we have found quite simple to explain to the men. Elevation is carried right along on the same note sheet, or vertical angles and heights of instruments are recorded for each point occupied by the instrument and the elevation then computed later. Another advantage of this note form is that the

traverse may be run without knowing the azimuth of the initial direction line until after completing the traverse. In this case it will be readily seen that the traverse may be run leaving columns 3 and 7 to be filled in after the azimuth of the initial direction line is determined by the connecting group.

Form No. 1 can be readily understood by comparing it with Fig. 1. Column 1 indicates the point over which the instrument is set up. Column 2 states the point backsited on. Column 3 gives the forward azimuth of the back-site—that is, forward with respect to the forward route of the traverse or the direction R.P. to I.P., for example. Column 4 describes the next point forward along the traverse or the foresite. In Column 5 is the clockwise angle from the

backsite to the foresite. Column 6 is (3200 minus Column 5), in which case the deflection angle would be minus, or (Column 5 minus 3200), in which case the deflection angle would be plus. Column 7 gives the algebraic sum of Columns 6 and 3. Column 8 simply states the distance from the occupied point to the foresite, to the nearest tenth of a yard. In Column 9 is the sum of the elevation of the occupied point and the distance from the ground under the instrument to the center line of

**INITIAL DATA**

Coordinates of I.P. 536 521-109 826  
 Name of Home Direction Line I.P.-R.P. 536 or R.P.-I.P. 3790  
 Description of any Point Occupied near Home Direction Line  
 Direction of I.P. 536 526  
 General Area and Altitude of Tabularly  
 Army Btry Area Group - A' Btry  
 Party Sgt. James C. Ph. Smith, Green's Squad  
 Date 12-2-43  
 Weather Clear and Hot - Daylight

Instrument set	Name of Point	Forward Azimuth	Distance to Foresite	Angle from Foresite to Backsite	Angle from Backsite to Foresite	Distance from Occupied Point to Foresite	Sum of Elevation of Occupied Point and Distance from Ground to Center Line of Foresite
I.P.	R.P.	3193	A	288	1627	3200	536.5
A	I.P.	1637	B	3026	2262	3200	536.0
B	A	2262	C	2221	2221	3200	536.3
C	A	2262	D	2221	2221	3200	536.3
Distance on Line	A	4493		2752	2752	3200	
				A. C. 4493 2752			

Form 1

unmapped South Pacific island—that is, unmapped with anything even slightly approaching firing chart accuracy. In country like this survey plays a most important part. It is much more difficult and tedious than ordinarily and, as Capt. Oliver says, the traverse becomes the most commonly used operation. Also, it will not be unusual to have two or three thousand yards between flank batteries because of the scarcity of battery positions in this sort of terrain.

During our time here we have made our own firing charts by entirely mapping the island, using over 250 miles of traverse (mostly closed) and of course putting in innumerable complete battalion surveys, with very good results in actual firing. With this experience behind us then, our methods (which you will see are a combination of the three articles mentioned above with a little extra thrown in) should be of particular interest to the Battalion Survey Officer who expects to operate in this theater, if only to give him some new ideas.

First of all, in the jungle the three battery positions of a battalion are in most cases separated by thick growth and instead of the battery area group being a single party it actually consists of a traverse group for each battery. Consequently it is usually not possible to have one continuous orienting line for all three batteries. This problem has been solved by giving a predetermined direction to the orienting line of each battery (thus making them parallel lines), or letting each battery traverse group put in its own orienting line and announce its direction upon completion of its traverse. For these three traverses we use a traverse team from each battery with an aiming circle or the BC 'scope, leaving the transit for the longer

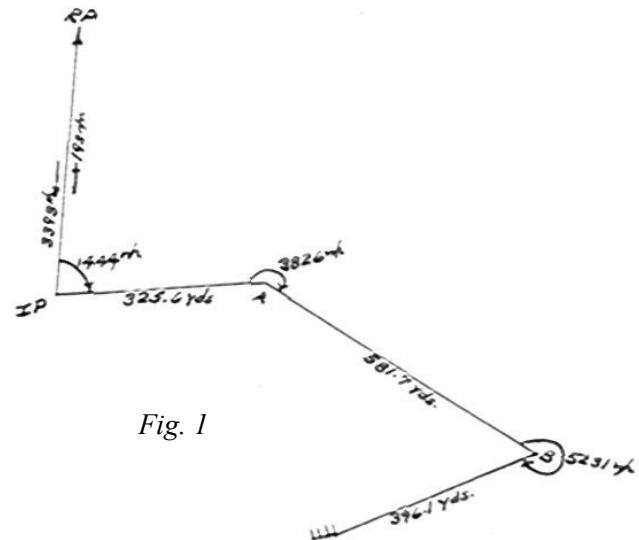
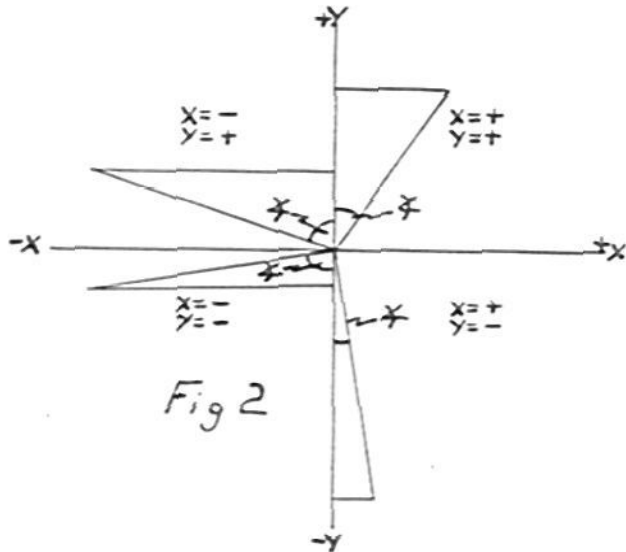


Fig. 1



the eye piece (Height of Instrument or H.I.). Column 10 is the product of the vertical angle to the foresite and the distance to the foresite in thousands of yards (mil relation). Column 11 indicates the algebraic sum of Column 9 and Column 10.

To calculate the traverse we use bearing angles only, as described by Maj-Bisbort; however, we have named it "The Angle" for simplicity, and represented it by the symbol  $\angle$ . For an example, in the case of the leg AB in Fig. 1 we imagine a grid intersection to pass through the Point A; "The Angle" =  $3200\text{ mil} - 2263\text{ mil} = 937\text{ mil}$  or the angle the leg makes with the nearest end of the Y-Line. "The Angle" is of course always less than  $1600\text{ mil}$ . Then it is very simple to see that the sine of  $\angle$  multiplied by the length of the leg always equals the X offset, and the cosine of  $\angle$  multiplied by the length of the leg equals the Y offset. Whether the offset is plus or minus depends upon the quadrant in which the leg lies, as shown in Fig. 2.

To compute this traverse we use a form similar in principle to the one suggested by Lt. Lampert, except that as Capt. Oliver suggests we have simplified it by using natural functions and the slide rule instead of logs; we have found this method much easier for the men to understand than logs, and much faster. In the computation form (Form No. 2), Column 1 designates the leg of the traverse. Column 2 gives the azimuth of the leg. Column 3 is  $\angle$ , as explained above. In Column 4 is the length of the leg. Columns 5 and 6 are the sine and cosine of  $\angle$ , accurate to four decimal places. Columns 7 to 10 are the X and Y offsets put in the proper column depending on whether they are plus or minus, according to the quadrant in which the leg lies. To determine the coordinates of the last point on the traverse, the X offsets (plus and minus columns) are added,

their difference taken, and the sign noted. The same procedure is followed in the case of the Y offsets. Then these differences (or the total X offset and the total Y offset) are added algebraically to the coordinates of the initial point. The result is the coordinates of the final point on the traverse. It will also be seen that the coordinates of any intermediate point may be calculated likewise.

Up to this point we have covered only the running and the computation of a traverse, and it will be noted that addition, subtraction, and multiplication, along with natural sines and cosines, are the only principles used. If we add the use of the tangent for figuring base angles, and the Law of Sines for target area surveys and solving oblique triangles, we have found that we can solve any problem of field artillery survey. To sum up, then, the only new principles that must be taught to the average survey man are the sine, cosine, and tangent for right triangles and the Law of Sines for oblique triangles.

For computing base angles we use Form No. 3 and a method which involves no new principles but does not seem to be generally used. We first determine, by the methods described above, the coordinates of the base point and of the base piece of each battery, and the azimuth of the orienting line. The coordinates of the base piece are subtracted from those of the

base point; an imaginary grid intersection is assumed to pass through the base piece and, by noting the sign of the total X and Y offsets, a rough sketch is made of the relative position of the base point. The angle the base line makes with the

nearest end of the Y-line ( $\angle$ ) is determined by solving the equation:  $\angle$  equals an angle whose tangent is X offset/Y offset

Sta.	Dist.	Az.	$\angle$	Sin	Cos	X	Y	Area	
TP-A	1037	1503	325.0	.9933	.0303	325.7	11.8		
A-B	2263	937	581.7	.7955	.0609	402.7	152.5	722.1	
B-Base	4294	1094	390.1	.8791	-.4708	788.1	185.8	4223.3	
							788.1	340.2	521.1
							521.1	340.2	521.1

Form 2

COMPUTATION OF BASE ANGLE

Battery "A"

Pn. Area west of Tabouille

Date 7-4-43

Computed by Sgt. Jones

Sgt. Cpl. Smith

Coord. Base Point 572.621 - 104.200

Coord. Base Piece 527.261 - 109.283

$X = +5260 ; Y = -5023$

$\angle$  = Angle Base Line makes with nearest end of Y-Line

$\angle$  = Angle whose Tan =  $\frac{X}{Y} = \frac{5260}{5023} = 1.047 ; \angle = 823\text{ mil}$

Y-Az Base Line: Quad. #I =  $\angle$

#II =  $3200 - \angle = 3200 - 823 = 2377$

#III =  $3200 + \angle =$

#IV =  $6400 - \angle =$

Base Angle: Az. of O.L. (+3200 if nec.) = +030

Az. of Base Line = 2377

Base Angle = 1075 mil

En. Base Piece to Base Pt. =  $\frac{X}{\sin \angle} = \frac{5260}{.823} = 7276\text{ Yds}$

Form 3



and referring to the surveying tables for the answer. Knowing this angle, one readily determines the azimuth of the base line. The base angle then equals the azimuth of the orienting line (adding 3200 $\mu$  if necessary) minus the azimuth of the base line. An example is worked out on the accompanying form.

These three survey forms may make it seem that we are "form silly," but from our experience it is found that a set method of doing this type of work is invaluable because it facilitates rapid checking for those careless mistakes which are many times more frequent than errors in theory. If left to his own devices each man will put his notes and calculations down so that more than likely he will be the only one who understands them, whereas if set forms are used as far as possible, any man in the battalion survey group or battery instrument groups can take over at any point and continue right along without any delay or chance of misunderstanding.

Another "gadget" we have found useful is an enlargement of the Short Base Chart put out by the Field Artillery School. After recalculating all the curves and replotting them to a larger scale, we were able to read ranges accurately to within two to four yards.

#### SUNDRY SUGGESTIONS

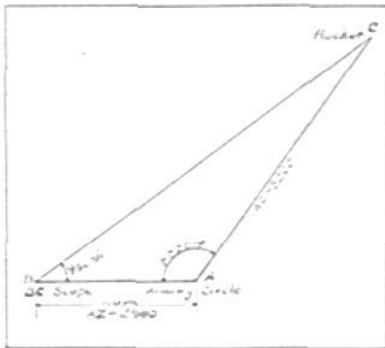
I'd like to say "Amen" to the article *How It Actually Works Out*

## Initial Data From Rocket Bearings

By LT. JAMES J. LANDY, FA

Lt. Landy developed and refined this procedure as a result of suggestions by Col. E. B. Edwards, Artillery Officer of his Armored Corps. Results have been spectacular: in many cases the initial round has been placed within 100 yards of the target.

Often a forward observer, whether or not with an armored outfit, is in a fast-moving situation. He may know nothing of the whereabouts of his battalion, although prescribed methods presuppose that he knows at least its general location. Actually he may make his initial sensings in precisely the wrong directions, in which case all rounds will be wasted.



The method here suggested keeps the first round in enemy territory, and as close to the target as the accuracy of the FO's initial sensing permits. FO senses the target's location from a known location (rocket is known to battery and observer) with reference to compass points; the battery determines

direction to the target by a rapid plot.

#### PROCEDURE

FO determines magnetic north by using his compass. His initial sensing of his rocket is then so much east (west) and north (south) of the target.

The adjusting battery sets up a 100-yard base at its position. Left end of the base is the BC 'scope in the executive's half-track, the right end is an aiming circle. BC 'scope zeros on the rocket, aiming circle measures the rocket's magnetic azimuth. Both instruments refer to each other, and the base angles are determined. BC 'scope immediately lays the battery on the rocket. From the base angles the vertex angle is determined and range to the rocket is computed.

At the start of the fire mission a plotting board and grid sheet are set up. The rocket's position is arbitrarily picked as being the intersections of two grid lines. The magnetic azimuth determined by the aiming

on page 128 in the February, 1943, FIELD ARTILLERY JOURNAL. We have found the same conditions and problems exist here on this island, almost word for word.

In spite of what the T/BA calls for, swap your 20-second transit for a more rugged one-minute mountain transit such as the Engineers and Antiaircraft regiments have. The one-minute transit is accurate enough, smaller, lighter, more rugged, and has a tripod with telescoping legs.

Buy from Eugene Dietzgen Company some "Eureka" tape splices in both the 5/16" size (for your 300' steel tape) and 1/4" size (for your new 100' tapes). These allow you to mend a steel tape in about 10 minutes, and the only other tools you need are a match and a knife. Provide your survey crews with a machete or brush hook per man, if possible. You can't have too many of these.

A simple system of arm signals taught your men will save a lot of unnecessary shouting back and forth which might give away your position.

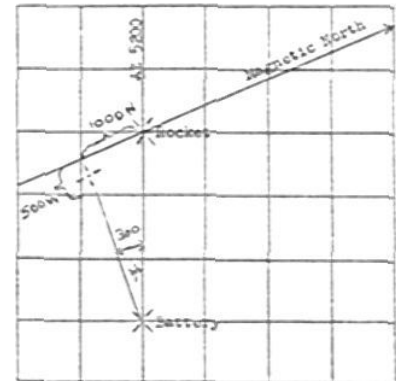
Again in spite of the T/BA, a couple of small infantry 536 radios would be very useful.

And above all don't forget your initiative and ingenuity, because you'll find that very few if any of the systems in "The Books" work *in toto* in the jungle.

circle is assigned to the grid from rocket position to battery position; battery is plotted along this grid line at the range determined. Magnetic north of the grid sheet is now laid off by using a protractor at the rocket's position.

Using FO's sensing, the target can now be plotted with reference to the rocket. A shift from rocket to target can now be measured and applied to the howitzers. Range is as measured on the chart.

With a trained crew this entire operation can be done within 3 minutes from the time the observer fires his rocket—but even if the procedure were to take 2 or 3 minutes longer, the accuracy of that initial round is well worth the extra time.



#### EXAMPLE

FO reports, "Rocket is 500 West 1000 North."

BC 'scope zeroes on rocket, measures angle CBA as 950 $\mu$ , immediately lays the howitzers.

Aiming circle determines magnetic azimuths of lines AC and AB. Angle BAC is the difference between the two.

Range to rocket is now computed as 3,000 yards.

A grid intersection has already been designated as the rocket's location. The battery is plotted 3,000 yards away, along a grid line—which latter is designated as azimuth 5200.

Magnetic north is drawn through the rocket's location, and the target is plotted with reference to the rocket.

Shift from the rocket is determined as left 300 $\mu$ ; range is 2,400 yards. This data goes right to the guns, and the first round is fired.

# THE SHORT BASE RESECTION

By Maj. T. N. Dupuy, FA

In a recent article in THE FIELD ARTILLERY JOURNAL\* Lt. J. E. Bean explained an excellent application of the Italian resection to a two-point, two-position method of resection. Fine as the method is, it has several limitations which can, I believe, be overcome in what I shall call for want of a better name the Short Base Resection. The basic principles of this Short Base Resection are very briefly outlined in Par. 2, Appendix III, FM 6-40.

In the first place, in Lt. Bean's method, there is the necessity for working in the open with an exposed plane table—not merely at one, but at two positions. As suggested in *Streamlining Resection* in the March-April, 1940, JOURNAL, the relatively lengthy procedure of working an Italian resection on a plane table gives an excellent panel target for both enemy planes and artillery. This shortcoming can be eliminated, of course, by applying to Lt. Bean's Two-Point Italian method the principles of the Geometric Italian Resection as described in the above-mentioned article and in Par. 1d of Appendix III, FM 6-40.

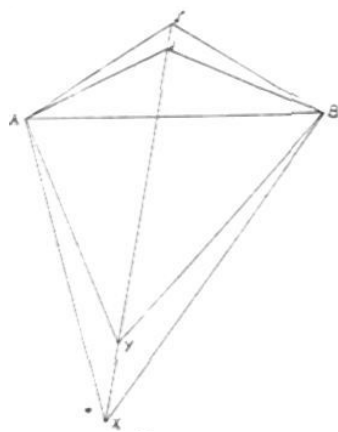


Figure 1

The next limitation is in the choice of positions X and Y (see Fig. 1) of the Two-Point Italian (as I shall henceforth call Lt. Bean's method). When we do a two-point resection we do it because the two known points are either distant, within the enemy's lines, or otherwise inaccessible. If the points are not distant and are accessible, then obviously the best method of locating our unknown point would be by intersection from the two known points. This would be just as quick as and more satisfactory than a Two-Point Italian. Now when the two known points A and B are distant, unless they are also very distant from each other our two unknown points (X and Y) must be chosen a considerable distance apart or else the line dd' will be too short for accuracy (see Fig. 1). This fact makes me believe that the best application of Lt. Bean's Two-Point Italian is when the two known points are roughly on opposite sides of the unknown point (see Fig. 2). Here, however, we have the further difficulty that the closer the angles AXB or AYB approach 3200 mils, the greater will be the difficulty of obtaining an intersection for d and d' on the map.

In its essence the method mentioned in Par. 2, Appendix III of FM 6-40, is an intersection in reverse (see Fig. 3). By short base methods we get the four unknown distances: PA, PB, SA, and SB. Knowing these we can determine angles 5 and 6 by computation and thus, using the known distance AB as a base, obtain the location of P by plotting or computation.

\*Page 327, May, 1943.

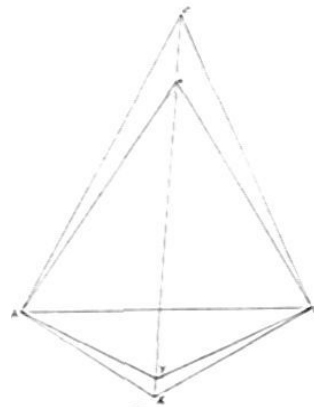


Figure 2



Figure 3



Figure 4

Still another means of finding the location of P is merely to obtain the lengths of AP and BP by short base methods and locate P with intersecting arcs. Using compasses, dividers, or even a straightedge, with A and B as centers and AP and BP as respective radii, we can strike arcs which would intersect at P (see Fig. 4). This involves less computation and sacrifices little, if any, accuracy. We can check the accuracy by measuring angle APB with a protractor and comparing it with the angle measured with our instrument.

There are several considerations involved in this Short Base Resection. All are concerned with the choice of point S. Par. 347a of FM 6-40 tells us that the angle of intersection opposite the short base should be 100 mils. This gives us the rough rule that the base of a Short Base Intersection should be approximately one-tenth of the range to be measured. We should be able to estimate the ranges PA and PB closely enough to apply this rule. Certainly, if we can read a map at all, we can figure our location close enough to be able to measure the ranges to the two distant points within a thousand yards. Unless one or both of these points is on very high ground, they will rarely be identifiable on the ground if they are more than 5,000 yards away. A base of 500 yards, therefore, would not be unusual. Of course there is no need to limit ourselves to one tenth of the range. If the line PS is too long to tape readily, we all know that it is a simple matter to "short base the short base." Two other considerations in the choice of point S are the direction of the line PS and the necessity for A and B to be visible from S. The need for visibility is obvious. The direction of the line must be such that angles ASP, APS, BSP,

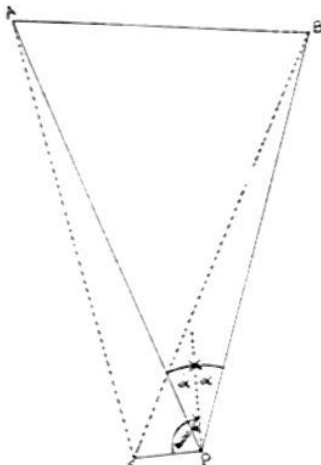


Figure 5

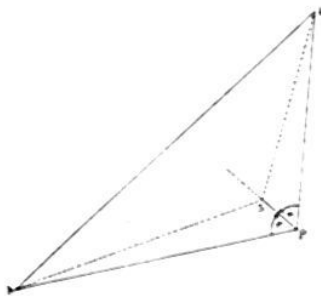


Figure 6

and BPS will be neither too acute nor too obtuse. Until practice has developed facility in estimating the best direction for the short base, the following simple rules may be of assistance. When angle APB is less than 1600 mils (see Fig. 5) the line SP should be roughly perpendicular to the bisector of angle APB. It would be better less than perpendicular than greater than perpendicular. When APB is greater than 1600 mils (see Fig. 6), line PS should run roughly along the bisector of angle APB. When angle APB is between 800 and 2400 mils, the length of SP should be at least one seventh the estimated range to the furthest point. If you have to deviate greatly from those rough rules, you should get satisfactory results by making SP arbitrarily twice as long as normal. Actually, common sense and an estimate of the situation will govern you in the selection of S. If you are guided by the rules given above the angles of intersection will practically always be well within the arbitrary limits laid down in Par. 347a of FM 6-40.

Sometimes we find ourselves in the predicament of having only one distant or inaccessible point which we can identify both on the ground and on our map. We are lost unless we combine the Short Base and Back Azimuth methods of resection. We realize that the use of our compass needle will

jeopardize the accuracy of our location, but even an approximate location is better than none. Under the circumstances, therefore, we will be forced to take this chance, and need not worry too much about accuracy if the instrument has been declinated recently.

Application of the methods is quite simple (see Fig. 7). We merely short-base the known point, get the azimuth thereto from our instrument, and compute the back azimuth. From the map location of the point we lay off a line

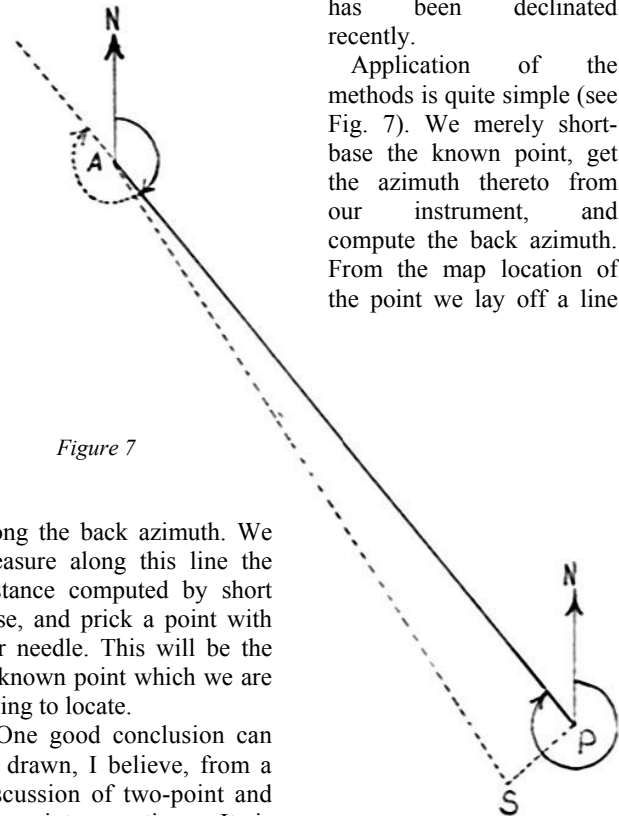


Figure 7

along the back azimuth. We measure along this line the distance computed by short base, and prick a point with our needle. This will be the unknown point which we are trying to locate.

One good conclusion can be drawn, I believe, from a discussion of two-point and one-point resections. It is very doubtful if there is a more accurate, more rapid, or safer method of locating oneself than by an Italian Resection, plotted safely, under cover and concealment, from two angles measured at the unknown point. The methods described above should only be used when three points cannot be identified both on ground and map.

#### GERMAN RICOCHET DOCTRINE

Considerable progress has been made by German artillery in the use of ricochet fire. It is recognized as being useful, effective, and not mysterious. Although it can not be used in every case, the possibility should always be examined. Our own investigations have borne great fruit, and as our doctrine develops it is interesting to see what the Germans have to say.

"Investigate the possibility of using ricochets. The decisive factor is the angle of impact on the terrain, not the angle of fall. Angles of impact up to 270 $\mu$  (15°) can be expected to result in ricochets; and even beyond that (up to 360 $\mu$  or 20°) ricochets are possible. In many instances it will be necessary to resort to practical trial." We have found ricochets entirely practicable at *angles of impact of 520 $\mu$  and greater.*

"Irregular lateral position of ricochet bursting points with respect to one another, is not sufficient evidence that the shots were not fired from parallel barrels. The lateral position of such points of burst is to some extent determined by the nature of the terrain at the point of ricochet." In other words, a projectile may be deflected from its plane of fire when it ricochets.

"Adjust with non-delay fuze, obtaining a bracket conforming to the depth of the target. After a shot has been placed within the target, change to fire for effect with delay-action fuze at the range diminished by 50 meters." Reducing the limits of the zone for fire for effect compensates for the projectile's additional travel, between its point of impact and point of burst. If ricochet fire for effect were conducted through the bracket established by a super-quick-fuzed projectile, part of the effect would be "over" and the near edge of the target would remain unscathed.

"When firing ricochets, a change in charge calls for renewed bracketing."

# SPEED AND SURVEY

By Lt. Francis Kernan, FA

Those words above do not mix in the average survey. One cannot literally jump from OP to target area and back to the gun positions, and rough terrain often hampers survey connecting a pair of OPs. But perhaps a system that is working for us on a rugged South Pacific island will help you too.

As there usually aren't enough transits to go 'round, we find ourselves on OP "A" (Fig. 1) with an aiming circle. We have

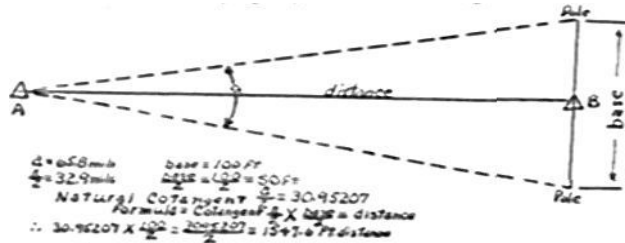


Figure 1

sent over to OP "B" a party equipped with two poles, tape, and—for convenience—an aiming circle and a radio. As the figure shows, they set off two right angles and place their poles at equally taped distances on either side. Though the aiming circle is generally used for turning these angles, it is actually a luxury: the tape will do just as well, if we use the old carpenters' rule of the 3-4-5 triangle. But how long should the base be?—of course, the longer the more accurate, but even with an aiming circle (instead of a transit) we have found that a 100' base (50' to either side) will let us measure 1,000 yards accurately. A good working rule, especially for long shots with aiming circles, is to spread your poles to get about a 30 mil angle on each side of the point; then the cotangent will not be changing too rapidly for your small errors of measurement.

With the poles in place, from "A" we measure the angle between them; and we re-measure this angle "a," for accuracy. The distance is now as good as ours. In a table of natural functions of angles in mils, look up the cotangent of  $\frac{1}{2}$  "a," multiply it by half the base at "B," and you have your distance. If a transit is used, the base can be shorter and Table IV of TM 5-235 used for making the computation. In either case only simple arithmetic is used; there are no involved formulas.

Appropriate angles can now be turned from both "A" and "B," and targets located by intersection.

For the connection area survey and those jumps, oftentimes a point may be seen from one OP and yet be masked from the other, so that a shortbase method would be very difficult. But we only need a small opening between some trees to make one of these cotangent set-ups. With our radio we can send the party at "B" down to such a point and, repeating the above process, come at least near the gun position with one shot.

Of course there are a lot of conditions that will arise, but if

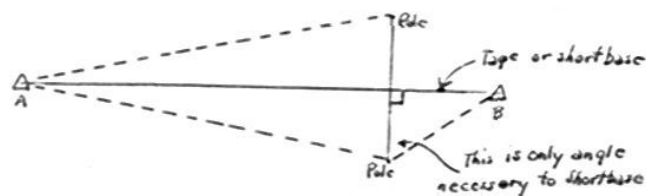


Figure 2

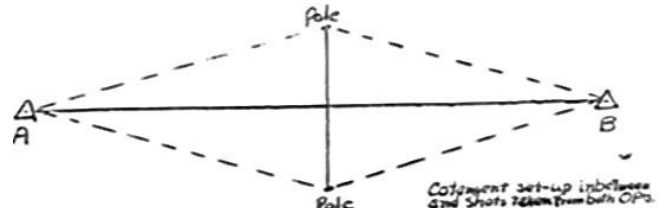


Figure 3

you will consider Figs. 2, 3, and 4, you will note that most of the cases you will meet will be solved. Notice (Fig. 2) that we can get the distance from the set-up to "B" either by taping or by shortbasing with one side of the set-up as a base. This too is simple arithmetic—multiplying the cotangent of the angle by the base. To avoid an obvious error in Figs. 2 and 3, the angles of site must be taken and the distances corrected to the datum plane (multiply by the cosine of the angle of site). These various set-ups would be necessary when the hills are too rough or narrow to be used themselves. Both Figs. 3 and 4 require only one man with an instrument to occupy the OPs—a good thought for combat conditions.

What is the accuracy of all this? Well, over here we have measured distances of over 4,000 yards at one shot with an aiming circle, spreading our poles out 300 feet on each side, and had a maximum error of 2 yards in balancing a system of triangles. This is with a 4-power aiming circle, remember. What is more, these shots were made and computed in a total time of less than half an hour. This is much faster and even more accurate than our shortbase work. Try it for yourself. We were and are being surprised at the ease with which we can measure distances.

One other thought about survey that perhaps some do not use or have forgotten: azimuths are a good independent check on

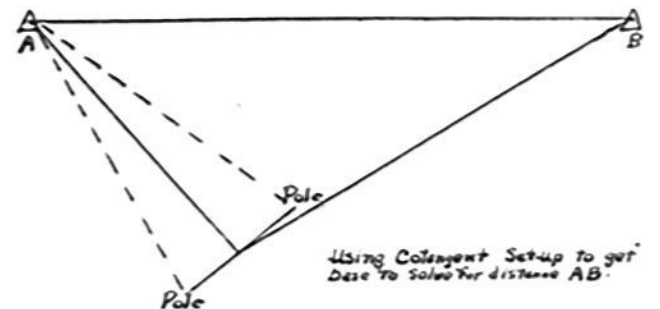


Figure 4

traverses. All we have to do is to carry along our calculated azimuths, and by checking with an occasional measured azimuth we can find most errors when they occur so they can be corrected on the spot. The azimuth is so easy to compute that your recorder can easily do it as you go along, without holding up the section at all. To compute when running aiming circle traverses with clockwise angles from the rear station, take starting azimuth, add next measured angle, and then subtract 3200 mils. This gives the azimuth of the next line in your survey, and this chain of figures will carry your accumulated errors, showing the value of your work. This has proved of great value in training new sections in position and connection surveys. For transit work simply carry along the bearing of each line by a glance at the compass, thus getting a constant check.

# S-2, DIVISION ARTILLERY

By Capt. Malcolm R. Wilkey, FA

The exact functions of the Division Artillery S-2 are nebulously and variedly defined, depending on the manner in which the individual Division Artillery Commander wishes to use the particular officer assigned this job. One would think that the S-2 officer is primarily concerned with Military Intelligence; in original theory this was correct, but in present practice rarely so. Few voices have pointed out that the S-2 is the intelligence officer with a very *definite* job to do, and that he should not be what practice usually makes him—another Assistant S-3 in the field, the odd-job man in garrison training.

In the Division Artillery section the S-2 has two enlisted assistants. Throughout the artillery battalions the survey and instrument men are supposed to perform S-2 functions. In combat this personnel is likely to find S-2 work assuming much greater importance than they ever thought possible, and themselves with an altogether inadequate training with which to handle it. In fact, since most Unit Training Programs give no time for special training of the survey men in intelligence work, these men get no more than occasional lectures or films on enemy organization and equipment.

In combat the Division Artillery S-2 will find three main subjects on which he must concentrate his time, if he is to perform his job for his commander and the artillery battalions. The first of these is TERRAIN.

It is not enough for the S-2 to ridge and stream-line aerial photos. He must actually *study* the lay of the land, forming definite ideas where the enemy is likely to be dug in, where his artillery positions will be found, and the chief routes of supply used. Of great importance are probable routes of approach for hostile infantry, on which the S-3 will plan concentrations. Possible positions for friendly artillery should be determined from maps, photos, and personal reconnaissance. This is also, of course, a concern of the S-3, yet he is usually so occupied with the tactical direction of the artillery at the moment that he has little time to offer more than a hasty estimate when, for example, a rapid displacement is imminent. The S-2 should be able to offer a more careful, thorough, and considered estimate, for his activities (if properly directed) have been concentrated on terrain in many different aspects.

Obviously one aspect is the location of OPs, the eyes of the artillery. Their exact location, and their assignment to battalions or batteries, is usually determined by the Bn COs or survey officers who are actually on the ground, and over *all* the ground. It is one of the jobs of the Division Artillery S-2, however, to make a rapid reconnaissance of observation possibilities in the area where employment of the artillery is considered. Since time will normally be limited, a careful prior study of available maps and photos is necessary to insure that he makes the most profitable and informative ground reconnaissance. An actual visit to selected points, plus maps and photos, should enable the S-2 to furnish the Division Artillery Commander with an accurate estimate of observation possibilities, including a rough division of the available OPs among the battalions. Armed with a knowledge of observation possibilities and suitable position areas, the Division Artillery Commander can confidently advise

the Division Commander from what general position the artillery can best support the infantry, and eventually formulate the plan for employment of the artillery. After the exact site of each OP has been selected, the battalions should inform the S-2 of the location and areas visible from it so he can be sure the entire front is covered. Furthermore, such knowledge will assist in evaluating reports of observers.

The road net is another proper concern of the S-2. He should always keep himself informed as to which roads and what bridges will carry the artillery's heavy loads. He should plan in advance how certain critical points can be by-passed, if need arises. Points can be critical because of a bridge which could be bombed or shelled out, a road subject to interdiction fire, or a stretch of road or a road junction on which heavy friendly traffic is likely to cause congestion. The Division Artillery S-2 need not make any personal reconnaissance for this information; he should consolidate reports from the Bn S-2s. If the Artillery S-2 maintains close contact with the Division Engineer Officer, and can anticipate events, he will be able to get much needed information in time.

One system for having pertinent information of the terrain available to the commander is for the S-2 to keep a sheet (or sheets) of acetate overlay showing ridge- and stream-lines, possible OPs, zones of observation, and roads capable of carrying the artillery. This can readily be placed over the situation map or the S-3 photo mosaic, to give a terrain estimate at a glance.

Second concern of the Division Artillery S-2 is the general TACTICAL SITUATION. Although the S-2 has his own sources of information within the artillery itself, his greatest source must be by close liaison with the Division G-2. After all, it is the front line of infantry units which is *the* front line in direct contact with the enemy, and the movements of the infantry (past and projected) which determine the artillery's movements and missions. From these infantry units G-2 is getting a constant stream of information. G-2 also has his reconnaissance troop, air observation, and close contact with higher and adjacent units. Information from all these sources should come to the Artillery S-2 frequently, so that his situation map will be as complete and up-to-date as G-2's. S-2 should keep on his map even such details as identification of enemy battalions in the line—not that it makes a particle of difference whether his fire falls on the 1st Bn 480th Inf or 3rd Bn 479th Inf, but in order that he may at all times have the "feel" of the situation. That "feel" may enable him to warn his commander precious minutes or hours ahead of the official word from Division that an enemy withdrawal is likely or that enemy pressure on the flank may force friendly troops back, thus enabling needed reconnaissance to be instituted at once. Of particular concern to artillery is the exact location of front lines, hence the S-2 should check often with the S-3 to be sure that any conflicting information is resolved before endangering friendly troops with artillery fire.

S-2's chief source of information with the artillery itself is reports from forward observers. Occupying the most advantageous observation positions, forward observers frequently

spot activity which goes unnoticed by the infantry. Forward observers have an additional advantage: they are not buried in the dogfight as are the doughboys. Trained as they are in exact location of points on the map and ground, reports of artillery observers are a particularly accurate check on front lines. Liaison officers with infantry regiments will also pass back valuable information. It is the task of S-2 to collate and evaluate this not only for his commander and the artillery battalions, but for G-2 at Division.

LOCATION OF TARGETS is the *primary* function of the Division Artillery S-2. Unless he is trained to do this well, his excuse for being included in the T/O is practically nonexistent. Division Artillery will fire on many targets immediately on discovery. In this circumstance the information may by-pass S-2 in favor of quick action through S-3, or even through one of the battalion S-3s. This practice is conducive to quick delivery of fire, and does not interfere with S-2 doing his job providing in all cases S-2 gets the complete information as to the type target fired on. S-2 then has another item to fit into the mosaic forming the complete picture of the enemy. There will be many targets (such as hostile OPs, gun positions not yet active, CP

installations) which Division Artillery will not fire on at once, but rather will wait until the critical time to shell out of action.

It is the responsibility of S-2 to locate both types of targets, but particularly the latter since the agencies most effective in locating targets requiring instant neutralization normally work as much with S-3 as with S-2. Among these agencies are forward observers of battalions, liaison officers with infantry regiments, and air observation from artillery liaison type planes. S-2 will be primarily concerned with air observation which is capable of flights over the enemy lines, particularly on photo missions. He must be awake to the opportunities offered for profitable photo flights, and not be backward in requesting them of higher headquarters if justified. The study of two sets of photos taken of the same area a day or two apart, or stereoscopic pairs of suspected areas, will do much to fill in the gaps in S-2's picture of the enemy position. If heavy reinforcing artillery is attached to the division, a Sound and Flash Battalion may be available also. Then the Artillery S-2 has another source of information to coordinate with those mentioned above, and an increased supply of that raw material which when processed through the mill comes out as military intelligence.

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#### RETREAT!

From now on we will be increasingly interested in Germany's conduct of retreats. Here is a translation of her doctrine of artillery support of the retreat.

"The beginning of a retreat must be concealed from the enemy as long as possible by artillery remaining in the earlier position. Wire connections are left intact in the interests of unified fire control, although there are circumstances when they may have to be sacrificed. Some pieces should be taken back to a rallying point or else directly to the new position. Isolated guns, detachments, or batteries remain with the rear parties.

"Be sure to give warning orders well ahead of time, as well as orders for the movements to be executed, since in a retreat more than at any other time commands and orders are likely to be received late, if at all. In giving the orders and commands, specify first the sector concerned, and then the road within the sector.

"Powerful artillery equipment (including batteries for long distance, flat trajectory fire) belongs with the rear guard. Choose firing positions along the road, providing opportunity for covered withdrawal. Use short distance communication (radio if possible); use artillery flyers with radio to the ground; and use a flash-ranging battery for both registration and tactical reconnaissance.

"Battalion and battery commanders remain with their troops, hurrying ahead only for the last part of the distance from one position to the next.

"Devote careful attention to each flank."

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#### RICOCHET AND TIME SHELL FIRE IN NORTH AFRICA

Practically no ricochet fire was sought or used by our artillery at the front, although artillery units in rear areas and British units armed with 105-mm Motor Carriage M7 used ricochet as well as time shell. Several reasons were given for non-employment of ricochet fire:

(1) Time fire has functioned satisfactorily. If the testimony of numerous prisoners is to be believed, Germans dread time shell. One of our divisions is reported to have based its plan of maneuver, to a great extent, upon the limiting range of time shell.

(2) No delay fuzes (other than the .05) have been available.

(3) The terrain was believed to be too broken for ricochet fire.

(4) Capabilities of ricochet fire were not fully appreciated. Since their entry into action, FA units have been engaged continuously with the enemy and have had little or no opportunity to train. Commanders were impressed with results recently obtained using ricochet fire in the United States, and stated that at the first opportunity its capabilities would be explored.

Most of our time shell concentrations appear to have been adjusted for a height of burst of about 50-60 yards. Results of tests in this country indicate that a burst center 15 yards high gives best effect.

Some German air bursts approximately 60-80 yards in the air were observed over one OP. These were fired approximately every half hour, apparently for harassing effect. The only other enemy artillery fire observed were impact bursts.

# Serviceman's Tax Guide

By Capt. Donald E. Stingel, Ord.

## WHAT IT'S ALL ABOUT

Income tax appears to most servicemen as a very complex problem, too difficult to solve. It is the intention of the *Serviceman's Tax Guide* to simplify this problem to the extent where income tax becomes a simple arithmetic calculation. In order to attain this end it is necessary to define a few terms to be frequently used in later discussion:

1. Withholding—deduction at the source of a certain portion of such income as salary or wages.
2. Net income—total income minus certain deductions, such as contributions to churches, interest, and bad debts.
3. Personal exemption—\$500.00 for a single person, \$1,200.00 for a married couple, to be subtracted from net income (see 2) before calculating surtax (see 9).
4. Credit for dependents—\$350.00 for each dependent (see 5) subtracted from net income, in addition to personal exemption (see 3) before calculating surtax (see 9).
5. Dependent—a person under 18 years of age or one physically or mentally defective, regardless of age, receiving more than 50 per cent support from a taxpayer.
6. Surtax net income—net income (see 2) less the personal exemption (see 3) and credit for dependents (see 4).
7. Earned income—salaries, wages, and compensation for personal service only to a maximum of \$14,000. All income up to \$3,000 is earned income.
8. Earned income credit—a credit of 10 per cent of the earned net income (see 12) up to \$14,000 or 10 per cent of the net income (see 2), whichever is the smaller, allowed for personal effort exerted in earning income. The earned income credit is to be deducted from the surtax net income (see 6) to arrive at the normal-tax net income (see 10).
9. Surtax—the tax on the surtax net income (see 6), starting at 13 per cent up to \$2,000 surtax net income (see 6) and rising in a graduated scale.
10. Normal tax—a tax at the rate of 6 per cent on the normal-tax net income, which is the surtax net income (see 6) minus the earned income credit (see 8).
11. Wages—all compensation for services performed by an employee for his employer.
12. Earned net income—earned income (see 7) minus deductions for such expenses in earning the income as, for example, expenses of an official trip for which mileage was received when mileage was included in the earned income.

## THE NEW LAW—GENERAL PROVISIONS PERTAINING TO SERVICEMEN

The Current Tax Payment Act of 1943 places in effect collection of tax at the source, or withholding, on wages. However, compensation paid to a member of the military or naval forces of the United States on active duty is not classed as wages and is therefore not subject to withholding, although it is subject to income tax.

The act allows up to \$1,500 to be subtracted from military or naval pay in computing net income, beginning in 1943 and continuing until the end of the war as proclaimed by the President. This allowance applies to both officers and enlisted men. For example, an army captain receives \$2,400 base pay during the year 1943. His military pay for tax purposes, after excluding the maximum of \$1,500 would be only \$900 for the year.

A sailor enters the service on August 1, 1943 after receiving \$1,200 as a civilian during the period January 1, 1943 to July 31, 1943. His naval pay amounts to \$600 for the balance of the year. He may deduct

**Capt. Stingel has as a hobby what is to many of us just an ache in both head and pocketbook. His interest in taxation has inestimably aided his fellow officers. He and we hope this outline will help guide you through the newly increased complexities of personal taxation.**

only this \$600 of the maximum \$1,500 special allowance in figuring his net income because the other \$1,200 received during the year was civilian pay and not naval pay.

Members of the Army and Navy Nurse Corps, WAVES, WACS, SPARS, and Marine Corps Women's Reserve are allowed the same benefits under the Act as are members of the Army, Navy, Marine Corps, and Coast Guard. Persons in the military or naval service of any of the United Nations, subject to income tax laws of the United States, are also included in such benefits.

Income tax owed by any member of the military or naval forces of this country or the United Nations who dies in active service on or after December 7, 1941, is cancelled, and any amounts already paid during the year in which the serviceman died will be refunded. This means that the serviceman's heirs will not be required to pay income tax out of the estate, if any.

The law also provides two special rules with regard to forgiveness of all or part of the 1942 taxes, with a particular provision for servicemen in Rule 2.

Rule 1. If the original 1942 tax figured on the March 15, 1943, return is less than the 1943 tax and:

- a. The 1942 tax is less than \$50, it is all forgiven and nothing is to be added to the 1943 tax.
- b. The 1942 tax is less than \$66.67 and more than \$50, \$50 is forgiven and the balance is added to the 1943 tax.
- c. The 1942 tax is greater than \$66.67, 75 per cent is forgiven and 25 per cent is added to the 1943 taxes.

For example, a WAC calculates taxes for 1943 (after subtracting from base pay the special exemption of \$1,500) to be \$75. Her original 1942 taxes are \$48. Since the 1942 taxes are less than \$50 (see Special Rule 1a above) nothing need be added to the 1943 taxes, which remain at \$75.

The 1942 tax of a sailor is \$60. His original 1943 tax is \$75. Applying 1b above, since the 1942 tax is greater than \$50 but less than \$67.75, subtract \$50 forgiven and add the remaining \$10 to the 1943 tax, making the revised 1943 tax \$85 instead of \$75.

The original 1943 tax of a serviceman is \$175, the 1942 tax being \$100. Since the 1942 tax is greater than \$66.67 (see 1c above), add 25 per cent of the \$100 or \$25 to the original 1943 tax, making the new 1943 tax \$200 instead of \$175.

Rule 2. If the original 1942 tax is greater than the original 1943 tax, including the Victory tax and taking into account the \$1,500 special military exemption in arriving at the 1943 tax, add to the original 1943 tax to figure the new 1943 tax:

- a. The difference between the original 1942 tax and the original 1943 tax, including Victory tax, and also add:
- b. Either one or the other of the following, whichever is the lesser:

- (1) 25 per cent of the original 1943 tax, including Victory tax if the original 1943 tax is more than \$50, or

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**Based on Current Tax Payment Act of 1943 and the Internal Revenue Code**

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(2) The amount by which the original 1943 tax, including Victory tax, exceeds \$50.

NOTE: The amount to be added to the original 1943 tax under the provisions of Rule 2*b* above will not be greater than 25 per cent of the original 1942 tax or the amount by which the 1942 tax exceeds \$50, depending on which is the lesser amount.

#### *Special Provisions for Servicemen*

If a taxpayer is in active service in the military or naval forces of the United States or any of the United Nations at any time during 1942 or 1943, the increase in the original 1943 taxes shown in Rule 2*a* above will be reduced by the same amount by which the original tax for 1942 is increased by including in the net income for 1942 the amount of the earned net income. (See definitions of the terms "net income" and "earned net income.") Rule 2*b*, however, still applies to military or naval personnel if the original 1943 tax is \$50 or more.

For example, the original 1943 tax of a serviceman (including Victory tax) is only \$25. His 1942 income is all from salary, and the tax is \$100. Applying Rule 2*a* above, the amount to be added to the 1943 tax would normally be the difference between \$100 and \$25, or \$75, but under the special provision for servicemen with respect to Rule 2*a* the \$75 difference will be reduced to zero because the 1942 income is all from salary which is earned income. Rule 2*b* does not apply because the original 1943 tax was less than \$50. Therefore, the total 1943 tax remains at \$25 and any amounts already paid on the 1942 tax become credits against the 1943 tax.

If, for example, in the case above, the original 1943 tax (including Victory tax) had been \$60 instead of \$25, then under the provisions of Rule 2*b* (2) above the serviceman must add \$10 to the original 1943 tax making the revised 1943 tax \$70. Any amount already paid on the 1942 taxes will be credited against any amount due on the 1943 taxes.

#### VICTORY TAX DISCUSSION

Contrary to the opinion of most servicemen, Victory tax has not been forgotten. Pay of servicemen is still subject to the Victory tax even though not subject to withholding at the source. This tax is in addition to the regular normal tax and surtax which make up income tax. The Victory tax from January 1, 1943 and thereafter is at the rate of 5 per cent, after allowing \$624 yearly exemption to be subtracted from Victory tax net income (which is the same as gross income except in very special cases not applicable to servicemen unless they have high income from a trade or business outside the army).

The \$1,500 exclusion for servicemen under the new law may be deducted from Army pay or Navy pay before arriving at the Victory tax net income. Then before calculating the tax at 5 per cent, deduct \$624 specific exemption whether single or married. For example, the pay of a Marine officer is \$2,650 during 1943. His Victory tax net income is \$2,650 minus \$1,500 or \$1,150. Single or married, with or without dependents, his specific exemption is \$624 per year; therefore, the amount taxable at 5 per cent is \$1,150 minus \$624 or \$526, and the Victory tax is \$26.30.

However, there is a post-war credit of 25 per cent for a single person, 40 per cent for a married person or head of a family, and 2 per cent for each dependent which may be currently credited against the Victory tax if the amount claimed in the credit has been used during the year to buy War Bonds, pay life insurance premiums, or pay off debts contracted before September 1, 1942. If, for example, the Marine officer in the illustration above were married and had one child under 18 years of age, he would be entitled to credit 40 per cent plus 2 per cent of the \$26.30 Victory tax, reducing the amount to be paid from \$26.30 to \$15.78. The \$15.78 may be added to the regular income tax for 1943 and paid at the same time.

In general, a serviceman who has a base pay plus longevity which after deducting the \$1,500 special exclusion is less than \$624, will pay no Victory tax for 1943. Therefore, a man in the service whose pay is \$2,124 or less will deduct the \$1,500 exclusion and then the Victory tax exemption of \$624, leaving no amount taxable at 5 per cent.

#### WHAT TO INCLUDE IN SERVICE PAY AND INCOME

In general, in figuring gross income for income tax purposes, include the following:

1. Base pay and longevity pay for length of service.
2. Foreign duty pay.
3. Flying pay and parachute pay.
4. Pay for qualifications in arms.
5. Payment from Government for transportation of dependents.
6. Mileage allowances (then deduct the actual cost of the trip).
7. Retirement pay of retired officers and enlisted men where retirement was for sickness or injury not in line of duty, or for age or length of service.
8. Any amount charged to an enlisted man's pay as an allotment under the Servicemen's Dependents' Allowance Act of 1942. (The amount added by the Government prior to giving the dependents the total allowance is not taxable and not included in gross income.)
9. Pay of the first year of retirement of an officer permanently retired.
10. Any income derived from an outside source, such as salary received from former employer during service term, dividends, interest, rents.

Do *not* include the following in reports of income for tax purposes:

1. The first \$1,500 of military or naval pay earned in the year 1943 or in subsequent years until the termination of the present war as proclaimed by the President.
2. Retirement pay received for the second and subsequent years of permanent retirement.
3. Subsistence or value thereof.
4. Monetary allowance for rent or quarters or value thereof.
5. Per diem allowance.
6. Uniform allowance.
7. Veteran's pension.
8. Retirement pay received for injuries or sickness in line of duty.
9. Part of Servicemen's Dependents' Allowance added by the Government to the enlisted man's allotment.
10. Entertainment allowance spent particularly for that purpose in connection with official duty, such as for example the entertainment allowance of a Lieutenant General.

Certain deductions from gross income are allowable in calculating net income. The deductions met most often by servicemen are as follows:

1. Contributions to charities, religious organizations, or educational institutions which are non-profitmaking.
2. Interest paid on loans or mortgages.
3. Taxes, such as real estate taxes, state income taxes, personal property taxes, automobile use tax, admission taxes, state gasoline tax.
4. Dues to professional society.
5. Collar ornaments, corps devices, campaign bars, and Sam Browne belts.

#### TRAVEL PAY AND PER DIEM

Mileage allowance paid to servicemen traveling on official business is considered gross income and must be included the same as base pay or longevity, but in the same way it is not subject to withholding at the source. However, the expenses of the travel may be deducted under the item "deductible expenses" incurred in earning the mileage and the earned net income under Item 1 on the standard Individual Income Tax Return. The itemized statement of expenses called for in allowing the deduction of the expenses of the travel should include:

1. Cost of transportation—railroad fare, bus fare.
2. Cost of lodging—hotel room, Pullman berth.
3. Cost of meals for which payment has not been received.
4. Total cost of trip—total of 1, 2, and 3.

Per diem in lieu of subsistence is considered an allowance and not pay, in the same way as subsistence, so it is not declared as income, is not taxable, and is not subject to withholding at the source.



THE DECLARATION OF ESTIMATED TAX

Under the provisions of the Current Tax Payment Act of 1943, servicemen whose gross income exceeds \$100 for a taxable year must file a declaration of estimated tax. The declaration for 1943 must be filed by September 15, 1943. For succeeding years, the declaration for the taxable year must be filed with the Collector by March 15 of the year in which the taxes are to be paid. If estimates must be revised upward or downward because of changes in pay, new declarations must be filed with the Collector by the 15th day of the last month of the quarter in which the revision of pay takes place.

For the year 1943, payments already made on the 1942 tax will be applied to the 1943 taxes instead of the 1942 taxes and offset against the estimate of taxes on the September 15 declaration. The balance of the 1943 taxes will then be paid in two installments on September 15, 1943 and December 15, 1943.

Where the original 1942 tax exceeds the original 1943 tax (see Rules 2a and b) the difference between 1942 taxes and 1943 taxes (reduced by Special Provision for Servicemen) must be included in the September 15, 1943 estimate; but the additional 25 per cent of the 1943 taxes (Rule 2b) need not be included in the estimate and need not be paid by the end of 1943. The extra 25 per cent may be paid in two equal installments on March 15, 1944 and March 15, 1945, or it may be all paid when the regular March 15, 1944 final return is filed for 1943.

In cases where the original 1943 tax exceeds the original 1942 tax (Rule 1) the increase in 1943 taxes of 25 per cent of the 1942 taxes need not be included in the declaration for September 15, 1943, but must be paid, either all on March 15, 1944 or in two installments—one-half on March 15, 1944 (with the regular final return for 1943) and one-half on March 15, 1945.

For years after 1943, payments of amounts of tax estimated on declarations made on March 15th may be made in four quarterly installments on the 15th of March, June, September, and December. Where a new estimate is made in a quarter of the year after March 15th, the remaining installments must be revised accordingly to make certain that current taxes are paid off by the end of the current year.

Severe penalties have been set up for failure to file a declaration, failure to pay an installment, and for gross underestimating on declarations (errors in excess of approximately 20 per cent).

The September 15, 1943 declaration and declarations for subsequent years should contain the following information:

1. The estimated tax for the taxable year.
2. The estimated credits for the taxable year (such as first two installments paid on 1942 taxes, or any amount withheld at the source).
3. The excess of 1 over 2, or the amount still to be paid.
4. A statement that the declaration is made under penalties of perjury, such as "I declare under the penalties of perjury that this declaration has been examined by me and to the best of my knowledge or belief is a true, correct, and complete declaration made in good faith for the taxable year."

Final returns for the year 1943 must be filed on or before March 15, 1944 with the local Collector of Internal Revenue, and any amounts still due as taxes for the taxable year 1943 after payment of the September 15, 1943 estimate will then be paid and penalties collected, and at that time any claim for refunds due will be granted.

For example, a serviceman, single when making his September 15, 1943 declaration, estimates his income for the entire year 1943 to be \$2,400 base pay and longevity. He estimates he will have purchased \$100 worth of War Bonds by the end of 1943. His estimated tax is as follows:

Estimated income .....	\$2,400.00
Exclusion of first \$1,500 service pay .....	1,500.00
Estimated net income .....	\$900.00
Personal exemption (single) .....	500.00
Estimated surtax net income .....	\$400.00
Estimated earned income credit (10% of \$900) ....	90.00

Estimated normal-tax net income .....	\$310.00
Estimated normal tax (at 6%) (1) .....	\$18.60
Estimated surtax (at 13%) (2) .....	52.00
Victory tax net income .....	900.00
Specific exemption .....	624.00
Taxable at 5% .....	\$276.00
Victory tax at 5% .....	13.80
Postwar credit (25% if War Bonds purchased in like amount) .....	3.45
Net Victory tax (3) .....	10.35

Estimated 1943 tax: (1) plus (2) plus (3) ..... \$80.95

Assume that the taxes for 1942 (based entirely on earned income) are \$100, of which amount \$25 was paid on March 15, 1943 and \$25 on June 15, 1943. The September 15, 1943 declaration will be as follows:

1. Estimated tax for 1943 .....	\$80.95
2. Credits for 1943 .....	50.00
3. 1943 tax still to be paid .....	30.95
4. Statement of perjury.	

Since the 1943 tax in this example was less than the 1942 tax, there must be added to the 1943 tax 25 per cent or \$20.24, which need not be put into the September 15, 1943 declaration but must be paid all on March 15, 1944 or one-half at that time and one-half March 15, 1945. The original 1943 taxes still to be paid as declared on September 15, 1943 must be paid one-half on September 15, 1943 and one-half on December 15, 1943. A final return must be filed on March 15, 1944.

AN EXAMPLE COMPARABLE TO YOUR PROBLEM

The following selected examples are intended to illustrate income tax calculations for servicemen of all grades and ranks, some of whom entered the service in 1942 and before, some in 1943, some with and some without extra outside income from sources other than military or naval pay. Many of the examples are given for military and many for naval pay, but by a comparison of grades in the various services the examples can be used to cover a great number of cases.

*Example 1.* An Army private enters the service on January 1, 1943. His pay is \$50 per month for the entire year. His 1942 income was an \$1,800 salary on which the tax was \$236.20, of which he paid \$59.05 on March 15, 1943.

Military pay for 1943 .....	\$600.00
Exclusion up to \$1,500 .....	600.00
Net pay declared .....	none
1943 Income and Victory tax .....	none

Since the 1942 tax was all on earned income, applying Rule 2 and the Special Provision for Servicemen, we find that there is nothing to be added to the 1943 tax and therefore the private will receive a refund of \$50.05 on March 15, 1944.

*Example 2.* A seaman, 1st class, married, who entered the service late in 1942, receives \$792 Navy pay in 1943 in addition to \$100 a month for the entire year 1943 from a former employer. His income for 1942 was \$3,500 (including civilian pay and Navy pay), all earned, and the 1942 tax was \$432 of which he paid the first two installments of \$108 each. His wife had no income in 1942 and has none in 1943.

Military pay for 1943 minus \$792 exclusion .....	none
Income from former employer .....	\$1,200.00
Personal exemption (married) .....	1,200.00
Surtax net income .....	none
Normal tax net income .....	none
Victory tax net income .....	1,500.00
Specific exemption .....	624.00

Taxable at 5% .....	\$876.00
Victory tax at 5% .....	43.80
Credit claimed at 40% .....	17.52
Net Victory tax .....	26.28
Total original 1943 Income tax and Victory tax .....	\$26.28

Applying Rule 2, although the 1942 tax is greater than the 1943 tax, since the original 1943 tax is less than \$50, 25 per cent need not be added to it; and since (under the Special Provision for Servicemen in Rule 2) the income in 1942 was all earned income, it is not necessary to add to the 1943 tax the excess of the 1942 tax over the 1943 tax. In this case the first two payments on the 1942 tax (totalling \$216) will be credited against the \$26.28 owed for 1943 taxes. The excess will be refunded on March 15, 1944.

*Example 3.* A master sergeant, married and with one child, earns \$138.00 per month base pay in 1943 and \$34.50 per month longevity for over 15 years' service. His pay for 1942 was \$1,704, on which the tax was \$20, all paid March 15, 1943. His wife did not work during 1942 but works all of 1943, earning \$175 pay per month. For withholding purposes she claims all of the personal exemption for a married person after July 1, or \$104 exemption per month plus \$26 per month exemption for the child. They file separate returns for 1943. The 1943 taxes of each are shown with wife claiming all of personal exemption and credit for dependent.

a. Husband—

Pay for 1943: \$2,070 less \$1,500 exclusion .....	\$570.00
Surtax net income (no personal exemption or credits for dependents) .....	570.00
Earned income credit .....	57.00
Normal-tax net income .....	\$513.00
Surtax at 13% of \$570 .....	74.10
Normal tax at 6% of \$513 .....	30.78
Total original 1943 tax .....	\$104.88
No Victory tax because the \$624 yearly exemption exceeds the Victory tax net income of \$570. All of the 1942 taxes are forgiven because they are less than \$50.	
Credits for March 15, 1943 payment .....	20.00
Tax due for 1943 .....	\$84.88

b. Wife—

1943 income .....	\$2,100.00
Personal exemption (husband and wife) and credit for dependent .....	1,550.00
Surtax net income .....	\$550.00
Earned income credit .....	210.00
Normal tax net income .....	\$340.00
Surtax at 13% .....	66.50
Normal tax at 6% .....	20.40
Total original 1943 income tax .....	\$86.90
Victory tax net income .....	2,100.00
Less specific exemption .....	624.00
Taxable at 5% .....	\$1,476.00
Tax at 5% .....	73.80
Post war credit (42%) .....	29.52
Net Victory tax .....	44.28
Total Income and Victory tax .....	\$131.18
Credits:	
Victory tax withheld from Jan. 1, 1943 to July 1, 1943 on six payments of \$175 per month .....	\$36.90
Withholding at 20% over exemption from July 1, 1943 to December 31, 1943 on 6 payments of \$175 per month .....	54.00
Total credits .....	90.90
Portion of 1943 tax paid March 15, 1944 .....	\$40.28

*Example 4.* A Navy lieutenant, married, has been in the service all of 1942 and 1943. His base pay in 1942 was \$2,400 on which the tax was \$189. His pay is the same in 1943. His wife is not working and he has no other income. The first two installments of 1942 taxes were paid.

1943 pay less \$1,500 exclusion .....	\$900.00
Personal exemption .....	1,200.00
Surtax net income .....	none
Normal tax net income .....	none
1943 income tax .....	none
Victory tax income .....	900.00
Less specific exemption .....	624.00
Taxable at 5% .....	\$276.00
Tax at 5% .....	13.80
Postwar credit (40%) .....	5.52
Net victory tax .....	\$8.28
Total 1943 tax .....	8.28
Credit for payment of 1942 taxes .....	94.50
Refund due March 15, 1944 .....	\$86.22

*Example 5.* A doctor, single, enters the service on December 31, 1943 in the grade of major after earning \$10,000 professional fees during 1943. His 1942 income, all from professional fees, was \$14,000; the 1942 tax was \$3,000, all paid March 15, 1943. Assume he had no military pay in 1943, therefore, he is not entitled to any part of the \$1,500 special exclusion. Assume deductions for 1943 are \$1,000.

1943 income .....	\$10,000.00
Deductions .....	1,000.00
1943 net income .....	\$9,000.00
Personal exemption .....	500.00
Surtax net income .....	8,500.00
Earned income credit .....	900.00
Normal-tax net income .....	\$7,600.00
Surtax .....	1,600.00
Normal tax .....	456.00
Total original 1943 income tax .....	\$2,056.00
Victory tax income .....	\$10,000.00
Specific exemption .....	624.00
Taxable at 5% .....	\$9,376.00
Tax at 5% .....	468.80
Post war credit at 25% (sufficient War Bonds purchased) .....	117.20
Net Victory tax .....	351.60
Total original 1943 tax .....	\$2,407.60
1942 tax .....	\$3,000.00

Since 1942 tax is greater than 1943 tax, Rule 2 applies. The excess of the 1942 tax over the 1943 tax is \$592.40, but under the Special Provision for Servicemen (since this officer entered the service prior to the end of 1943) the excess based on earned income need not be added to the 1943 tax; however, 25 per cent of the 1943 tax must be added:

Original 1943 tax .....	\$2,407.60
25% of 1943 tax .....	601.90
Revised 1943 tax .....	\$3,009.50
Credit for 1942 tax paid .....	3,000.00
Additional 1943 tax still owed .....	\$9.50

\* \* \* \* \*

In general, a serviceman whose 1943 pay, if single, does not exceed \$2,000 and whose 1942 income is all earned and does not exceed \$14,000, has no 1943 income tax or Victory tax and no 1942 income tax, and any amount already paid on 1942 taxes will be refunded.

A serviceman who is married, has no dependents, and whose wife is not working, with a pay not exceeding \$2,400, will have no 1943 income tax—only a very small Victory tax; and if the 1942 income is all earned and does not exceed \$14,000, he will have no 1942 income tax, allowing refund of 1942 tax payment in many cases.

# Occupation of Position by Service Battery

By Capt. David M. Levy, FA

Although the occupation of position by a service battery as a single unit or with the rear echelons of the firing and headquarters batteries of a battalion does not constitute normal procedure, there will be times when this situation will occur. A suitable solution to the problem must be obtained during our training period. Too much adherence to so-called normal procedure loses battles—therefore abnormal conditions must be foreseen and provided for.

Reconnaissance is of primary importance and should be accomplished by the service battery commander or the assistant S-4. This should be a ground reconnaissance whenever time and conditions permit, because a more detailed knowledge of the terrain is necessary than can be deduced from map reconnaissance. This reconnaissance should be made in daylight whenever possible. Conditions of roads, type of terrain, depth of hollows, amount of cover, avenues of approach, and several other factors must all be considered in determining the occupation of a position area. Approximate length of time position area is to be used is a prime consideration, since the type of occupation will in some cases be diametrically opposite for night from that used in daylight. The time for this reconnaissance may vary from a five minute interval between the reconnaissance party and the main body of the battery to several hours, depending upon the necessity for immediate action, prior knowledge of the terrain, and the general nature of the terrain.

After a brief reconnaissance (5 to 10 minutes) a plan for occupation must be formulated before arrival of the main body. This plan must put principal emphasis upon the ability to perform the service battery supply mission, provide maximum control, take full advantage of cover, and provide perimeter defense.

The following brain child was formulated as the result of many sessions with my battery officers, and is offered after the bugs have been ironed out through experimentation and practice. Ideas include those derived from reading of desert operations, a study of firing battery formations, common horse sense, and the reading of Western thrillers as a boy.

The most practical formation takes a

diamond shape. The BC establishes his headquarters as close to the entrance to the road as possible. With him during his reconnaissance were his bugler, driver, machine gunner, radio operator, scout, and 1st sgt., plus a peep containing a machine gunner, agent corporal, and chauffeur. The BC stations his bugler and scout at a point on the ground approximately 1,000 yards from the battery CP. For purposes of reference we will call this landmark the point, as it will be the distant point of the diamond. The bugler and scout will be furnished with a red and orange flag, respectively (taken from the flag set of the vehicle). Each ammunition section upon entering the position area will carry a flag of a predesignated color, namely: 1st Section: red, 2nd Section: orange, 3rd Section: green.

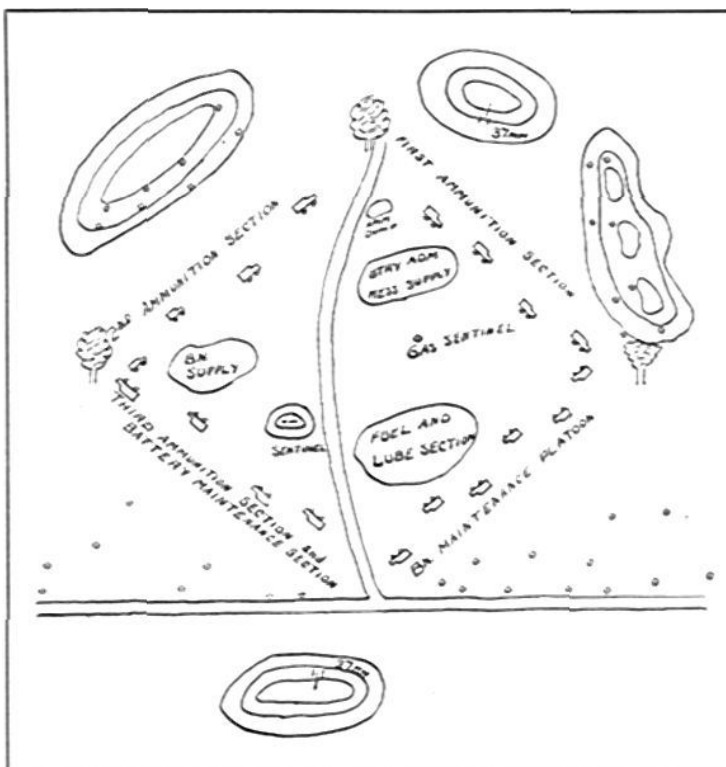
Upon arrival of the battery the ammunition officer in the leading vehicle is guided by the agent's chauffeur and machine gunner to the point, where the bugler mounts the first truck of the first section and guides him directly to the right, to a designated point on the right flank and to the rear of the point.

The scout boards the first vehicle of the second section and guides it sharply to the left to a predesignated point on the left flank and to the rear of the point.

The agent corporal, who has remained near the CP, boards the first vehicle of the third section and guides it on a left oblique to a position near the mark designated as the left limit of the second section, and approximately 100 yards from the last vehicle of the second section.

The first sergeant (who has remained near the CP) guides the battalion maintenance section on a right oblique from the CP to a mark designated as the right limit of the first ammunition section and approximately 100 yards from the last vehicle of the first ammunition section.

Each vehicle in a section follows the preceding vehicle in its section at a 100-yard interval. When the leading vehicle stops the others stop and make a very limited reconnaissance of their immediate vicinity and take the best position available. The BC takes a position near the CP and directs the fuel and lube section, and battery administration, mess, supply, and any attached vehicles to the best locations within the diamond. The purpose is to give the thin-skinned vehicles as much protection as possible. The two antitank guns are directed to that section of surrounding terrain commanding the best observation and greatest



possibilities of attack.

A perimeter warning system is established immediately upon arrival of the ammunition section at the bivouac area. The term "perimeter warning system" is used advisedly instead of the term perimeter defense, because under the conditions outlined above the service battery will not have perimeter defense. The weapons available are chiefly for anti-aircraft fire, and will not offer sufficient resistance against a mechanized ground attack. Although they may be effective against attacking foot troops, it is very unlikely that the enemy will employ foot troops against a service battery position.

To most efficiently utilize the weapons available it is recommended that each half-track send out two sentinels 300 to 500 yards to its immediate flank. One man is to be armed with the bazooka and the other with a rifle. Since each half-track is authorized one bazooka and one is authorized per four GMC 6×6 trucks, a total of 23 bazookas surrounding the battery position will give some protection and the impression of considerable fire power. Gas sentinels will patrol the position area.

In case of an attack by a mechanized force the perimeter sentinels must concentrate in the direction of the attack as much as is practical, and still maintain the warning system from other directions. Bazooka gunners will be required to fire their weapons individually while the riflemen return as rapidly as possible to the battery position. The bazooka gunner must employ a plan to shoot and drop back until he is close enough to the vehicle positions to get aboard before the battery moves out. The principal defense mechanisms of service battery are definitely mobility and speed.

It is obvious that there will be losses of personnel in connection with a plan of this nature. This must be accepted,

since the principal value of the service battery lies in the cargo carried in the vehicles. All drivers must be informed of a rallying point in case of an attack and must know the routes to use to reach it. Upon receiving orders to evacuate a position that is being attacked, drivers should take off in all directions like children being chased after upsetting the neighbor's outhouse.

The question often arises as to procedure for perimeter defense after the ammunition section moves out. Here the term perimeter warning system becomes even more appropriate. With the armor-plated half-tracks and their accompanying weapons gone, the best protection is greater dispersion of both vehicles and sentinels, the use of the sub-machine guns, a more thorough use of cover, concealment, and camouflage, and a greater trust in God. The return to the position by sentinels as soon as enough time has been allowed for the vehicles to move out, should be standard operating procedure.

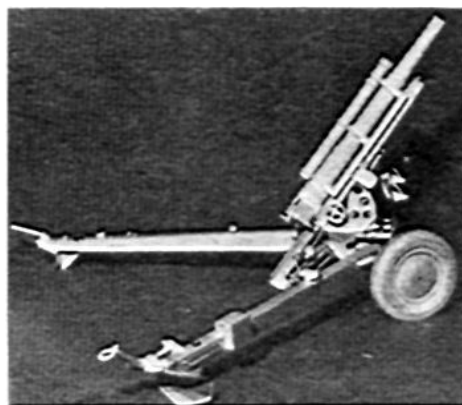
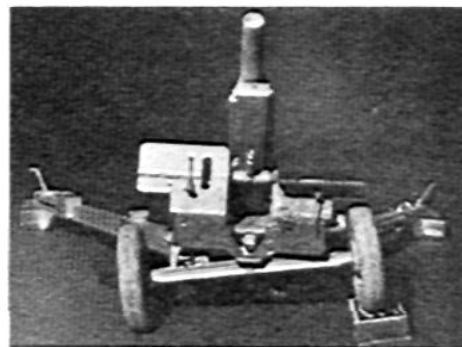
Control of the position area by the BC is attained by efficient use of available communication. The ammunition officer's radio half-track is most beneficial if placed close to the V-shape made at the point by the first and second ammunition sections. The battalion maintenance officer's half-track should be placed at the V-shape between the third ammunition section and the battalion maintenance shop. The BC's half-track is at the CP. Wherever possible, mounted or dismounted messengers should be used in the position area instead of radio communication. When the 10-ton wrecker is present within the area its siren makes an excellent signal for gas or mechanized attack. This can be no more than a supplementary signalling system, however, because its presence cannot be definitely relied upon.

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*This matchbox is the equivalent of a 10" obstacle for a real 105.*

Partly to learn all he could about the 105-how., Lt. Albert S. Haroun, S-3 of Sill's Replacement Training Center, carved a 1"-to-1' model that does everything but shoot. Complete even to the correct number of lugs on each wheel, it is equipped with the regular double-spring equilibrator and will elevate to the correct 1180<sup>m</sup> and traverse the standard 800<sup>m</sup>. Traveling locks permit the necessary cant. One of the most intricate parts is the breech block, which not only opens and closes but also can be field-stripped with or without the use of tweezers. Only things lacking are recoil fluid, firing pin, and elevating gears.

Aside from infinite patience Lt. Haroun used only pocketknife, sandpaper, and 1,000 straight pins (as bits to drill the many infinitesimal holes).



*Model in full elevation and traverse.  
Equilibrator rods are thread-like.*

# Not in the BOOK

## CLIP AND PLUG

The BC goes forward with his vehicle—he is in touch with his battery only by radio—he hears a possible OP, but he doesn't care to bring his car right up to the OP as cover is scant. The distance from OP to vehicle is too great to use voice and he can not see from OP to car. What can he do? Well, if the battery had more phones he could run a short local line to his car and have his commands relayed over the radio; but it so happens there aren't enough phones to go around. Well———?

Easy—when he left his car he carried one phone with him, already connected to a small reel of light wire. When he reached the OP, his radio operator at the car snapped a pair of test clips onto the wire. The clips in turn were connected by 2 or 3 feet of wire to a plug (PL-55). The radio operator inserted the plug into one of the two jacks in the receiver of the radio in the car. The operator's headset remained plugged into the other jack.

Now—the BC can talk to the radio operator directly over the phone. The operator speaks to the BC by throwing the transmitter to "Interphone" and using his mike as per normal. With the switch over to "Radio" he repeats the BC's commands over the radio as he hears them through the headset. This is the only relaying necessary, for since the BC's phone is plugged into the receiver, he will receive all transmissions direct from radio through his telephone receiver.

So much for the BC. What about the Exec? Initially the Bn FDC was using radio only—this being a fast moving gang—then shortly after the BC adjusted, direct wire lines were laid from FDC to each gun position. The Exec decided it would be faster if he could be plugged into the FDC line direct. So he took a headset, plugged it into one jack on his receiver (it is immaterial if the radio is on or off, preferably off), and plugged into the other jack with a gadget such as the BC used. He connected the test clips on his gadget a trifle differently, though: the clips were snapped onto the handset terminals of the phone marked "Common" and "Rec." This prevents the FDC from ringing into the radio and also into the headsets.

One more handy use: When telephones are scarce at the CP, run a wire line to those radio vehicles with which it is desired to connect by a party phone line. The same gadget is used as above. The plug is inserted in one of the receiverjacks, the test clips are snapped onto the party line, radio receivers and transmitters are switched to "Interphone," and intra CP communication by wire-interphone is complete. The party line for CP will be found a convenience, as information (specially that obtained over different radio sets) can be circulated at once, without sending messengers all over the area. It is a particular godsend at night. We have so used the radio sets as a substitute for telephones. Switch any receiver to "Radio" and the party line can hear all radio transmissions coming over that receiver. It is not intended that this arrangement be a permanent one, but it often comes in handy for short stays of an hour or two.

There's many a way these gadgets can be used. Several officers consider this a more simple, foolproof, and dependable remote control arrangement than the present issue type. At least all that is needed is *one* phone, wire, test clips, and a plug into the radio receiver. It offers considerable room for experiment.

COMMO

## MEASURING THE ADJUSTED COMPASS

In our windy country, vibration of the aiming circle head makes it very difficult to center the needle. The less often this process need be repeated, the better. We have therefore modified the process of measuring the adjusted compass.

As usual, the aiming circle is set up in rear of the base piece, declination constant is applied, and the needle centered with the lower

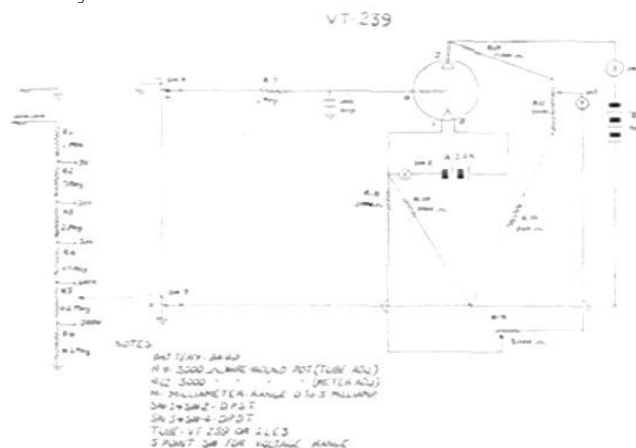
EDITOR'S NOTE: *This feature is devoted to ideas sent in by our readers describing methods or devices which, though not specified by official literature, have proved useful in service.*

motion. We then turn to zero (with the upper motion) and with the cross-hairs line in two stakes on the ground. Grid north is thus materialized, and usually the work is done before registration. After registering, the gunner lays the aiming circle reciprocally. With the upper motion, the aiming circle is referce to the line of the stakes. 6400 minus the instrument's reading is the adjusted compass.

T/SGT. HUGO C. PETERSON, FA

## SUBSTITUTE ME 13's FOR 610's

We have developed a vacuum tube volt-meter that serves as a good substitute for the ME 13, which is used to tune 610 sets on different frequencies. Although ME 13's are for issue they are a controlled item, and 610's tuned by hand definitely do not give the satisfaction of those tuned by a vacuum tube volt-meter.



If other units are interested in the building of such a meter, all parts may be bought at any radio store for a small amount. The accompanying diagram will assist them. We are sure that communications within their battalions will improve.

S. SGT. JAMES R. MYERS  
T/4TH GR. ARTURO F. RAMIREZ

## RAPID BORESIGHTING

We wanted a method of boresighting which would be accurate, speedy, and equally adaptable to daylight or dark. Rather a big order, but we think we have a solution; the brainchild of Lt. Seymour N. Mermelstein, it fulfills all three requirements.

Our weapon (the 8" howitzer) has a sight offset of 27" from the center of the tube. This distance can be determined for any weapon by measuring the distance between the lines marking the center of the tube and the vertical hair of the sight, on the issue test target. We reasoned that since 27" is three-quarters of a yard, it would subtend an angle of  $7\frac{1}{2}^\circ$  at 100 yards or  $15^\circ$  at 50 yards. Therefore all that would be necessary to boresight our howitzer would be to set an aiming stake either 50 or 100 yards to the front, boresight the tube on the aiming stake, and have the gunner refer to the stake and obtain a reading of either  $7\frac{1}{2}^\circ$  or 15, depending on the distance.

To facilitate measuring the distance for the stake each section can be equipped with 100 yards of salvage telephone wire; the 50-yard mark can be indicated by white adhesive tape. The gunner takes hold of one end of the wire and a cannoneer runs to the front with the rest of the wire and the aiming stake. Depending on conditions of terrain and brush, he goes out 50 or 100 yards and sets up the stake. Boresighting is then accomplished in a few minutes.

For boresighting at night, the obvious solution was to use the aiming

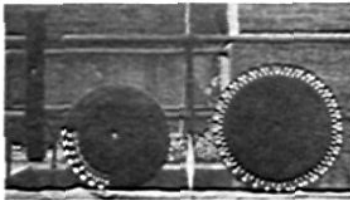
stake light. It worked out very well after we learned the trick of illuminating the muzzle boresight with an obliquely held flashlight.

An alternative method of checking the boresight in a matter of seconds also came to us during the tests we ran. After leveling the tube, the gunner refers to the end of the tube by placing the vertical hair of his sight tangent to the arc of the muzzle. If his piece is boresighted properly, he should read 116 on the sight. The only difficulty arises from the fact that the average sight can be made to "jump" one mil either way by shifting the position of the eye. To overcome this we required all gunners to shift their eyes purposely, and take the extreme readings from each side of the eyepiece; when the divergence was split we had the right reading. Obviously this reading of 116 applies only to 8" howitzers. Other weapons will have their own figures.

CAPT. EDWARD G. SEIDEL, FA

#### TRAINING AIDS

The principles of reciprocal laying and laying by compass and base angle can be brought out clearly by the use of large wooden models which show at the same time the lines of sight, 0-3200 lines, and line of fire. Models also seem to clarify the difficulty that many students have understanding the two 0-32 half circles on the scale of the panoramic sight. In addition, they clear up such mysteries as the movable index on the aiming circle and the fixed index on the sight.



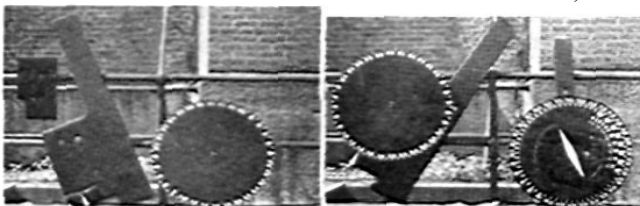
Parts of aiming circle

The accompanying photos show the demonstration aiming circle and piece used at Xavier University;  $\frac{3}{4}$ " plywood was used throughout. Diameter of the panoramic sight and lower motion on the aiming circle is 30"; 1" numbers are white on black, large and distinct enough to be seen throughout the average classroom. The piece is painted OD. Lines of sight and line of fire are red. Although they do not show very well in the photos, they are perfectly all right in class since once noticed they do not have to be read like the scales. Of course, no plateau scale is needed if the equipment is to be used only for training for materiel equipped with the panoramic sight.  $\frac{1}{2}$ " bolts hold the devices together.

The compass needle is white, and is leaded at one end so that it points "north." It is held in place with an 8-32 machine screw which goes into a hole drilled and tapped in the bolt head. A hole can be drilled through one end of the needle and into the upper motion, and a nail or pin used to lock the needle if this feature is desired.

These particular models are hung above the blackboard using the suspension devices shown. The piece should be suspended at its center of gravity so that when turned it will remain in any position. To determine this point first mount the sight on the piece. Now balance the complete unit on a narrow board parallel to the tube and draw a line along the board. Then balance the piece at right angles to the tube. Where the two lines intersect is the proper point of suspension.

CAPT. R. F. CISSELL, FA



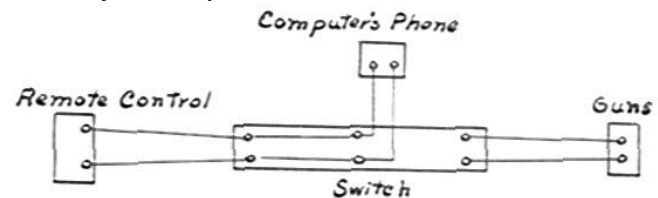
Parts of piece. Raised index is still assembled to gun. Note two holes in gun; the left one is for the sight, the right one is at the center of gravity when the sight is in place. Through the right hole is placed the bolt that fastens the piece to the mount as shown to the left of the tube

Aiming circle being used to lay piece reciprocally. Reading of 4600 on instrument should be sent to gun as 1400.

#### COMPUTERS' PHONES

I have just completed reading an article in the April JOURNAL, page 291, entitled *Radio in Fire Direction* by Lt. James H. McBroom, Jr. The article held much interest to me as at one time I had employed a slightly modified version of the communications net advocated by Lt. McBroom.

His net, I believe, has one flaw in it. If a "short" occurs in either the gun line or the remote control line the alternate also has a "short"; that is, a "short" in the gun line prevents use of the remote control. And a "short" is just as likely to occur as a "break."



To overcome this difficulty our computers' telephones were each equipped with a double-throw switch connected as shown in the accompanying sketch. If a break or a short occurs in the gun line, a quick flip of the switch will connect the computer with the remote control radio. Of course, in this system the computer does not talk simultaneously with the guns and forward observer as advocated by Lt. McBroom, but turns his switch as his conversation alternates between guns and observer.

LT. COL. R. C. GILDART, FA

#### ISSUE SHELL SEPARATOR

Capt. E. W. DeMoore is right (page 342 of the JOURNAL for May, 1943)—something must be done to overcome the difficulties of preparing the rounds for firing when other than Charge VII is used. But there is a simpler solution. Why build a device which will get in the way when we already have a nearly ideal separator issued with our ammunition?

Just use the fiber container in which the round is packed. At first two men may be needed, and their steps are these:

- (1) One man holds the assembled fiber case, with projectile end pointing slightly downward.
- (2) The other man removes the base cap, withdraws the case and its powder increments, prepares the proper charge, and then returns the case to its fiber container where it will fit snugly around the base of the projectile.
- (3) Both men turn the case and complete round upright, one of them removes the long portion of the container, and the round is ready for loading.

With a little practice, one man can learn to do the whole thing alone.

But a word of caution; this method is not a "cure-all," as it will not work with a damaged round.

CAPT. SAMUEL S. VERBECK, FA

#### COMPASS COUNTERWEIGHT

Units shipped to the South Seas or any place south of the equator will have trouble with their compass instruments. On arriving in New Zealand, every battery in our battalion reported that the needle supports of their aiming circles had been so damaged in shipment that the needles would no longer work. On checking into this I found that the north magnetic attraction had been so much reduced by our movement south that the north end of the needle had tilted to touch the glass. To overcome this tilt we made a coil of four turns of W-110 copper wire formed around a small match; this coil was then slipped over the north end of the needle by removing the needle magnifier assembly—this obviated the need of removing the glass for this operation. Our transits and M-1 compasses were weighted in the same manner.

CAPT. DIXWELL GOFF, FA

# Diary of War Events

(As Reported in the American Press)

## JULY, 1943

- 1 In occupying Rendova Island, US loses 17 planes and shoots down 110 Jap planes.  
Under personal command of General MacArthur, Allied troops push toward Salamaua.  
Savage aerial attacks continue on Sicily.  
Russians advance in Kalinin sector.
- 2 Heavy air activity continues over New Georgia Island.  
RAF blasts Sardinian port of Cagliari.
- 3 Navy intercepts 3 Jap cruisers and 4 destroyers attempting to shell US positions on Rendova.  
Bombing continues over Italy.  
RAF and 8th USAF give Germany and occupied countries another fierce round-the-clock pounding.
- 4 Flying fortresses obliterate German aircraft plant at Le Mans, knock out repair shop at Nantes, and damage U-boat installations at La Pallice.  
Allies bomb airfields in Sardinia and Sicily.
- 5 Navy reports a naval battle in progress in Kula Gulf (between New Georgia and Kolombangara Islands).  
German offensive starts in Russia on 160-mile front from Orel through Kursk to Belgorod.  
General Sikorski, Premier of Polish Government in exile, killed in plane crash.
- 6 German offensive in Russia continues with slight advance.  
Allied airmen raid Sicily, shoot down 56 planes, lose 12.  
Naval battle in Kula Gulf ends with Japs suffering the heavier losses.
- 7 US troops land on both sides of the main Jap base at Munda, New Georgia Island.  
Germans gain slightly in the Belgorod sector.  
Gen. Giraud arrives in Washington.
- 8 US troops close in on Munda, encounter strongly entrenched Jap resistance.  
Great tank battle rages on Russian front.
- 9 Allied bombers and artillery pound Jap base of Munda.  
RAF raids Cologne.  
Unceasing air raids continue over Sicily.
- 10 US, British, and Canadian troops land on Sicily on 100-mile front.
- 11 Allied troops push forward into Sicily, capture airfields and beachheads. Secretary of War Stimson lands in England to confer with military leaders. Russian forces hold back the German offensive in Orel-Kursk sector.
- 12 Syracuse among 10 towns captured by Allies in Sicily. Heavy fighting continues and enemy resistance stiffens as Allies advance deep into Sicily.  
US naval forces in the Solomons sink a Jap cruiser and 3 destroyers.
- 13 US troops meet British and Canadian forces at Ragusa. Heavy fighting costs enemy 53 planes, more than 100 vehicles, many ships; Allies lose 11 planes.  
Fighting slackens in the Kursk-Orel sector.  
US troops continue to close in on Jap base at Munda.
- 14 In Sicily we take 12,000 prisoners.  
RAF bombs rail center of Aachen, Germany. Flying fortresses with RAF blast German airfield in France, destroy 51 enemy planes.  
14th US Air Force in China continues to raid Jap positions in Hunan Province and the Haiphong area of Indo-China.
- 15 Despite stiff resistance Allies gain 4 miles beyond the port of Augusta, US troops push northwest of Ragusa.  
Red Army seizes the initiative near Orel.  
Allies capture Mubo, last important enemy defense before Salamaua.
- 16 Allies continue to push eastward in Sicily; 20,000 prisoners captured to date.  
Russians advance 6 to 10 miles in the Orel sector.  
100 US planes bomb Munda.
- 17 Americans gain 10 miles in Sicily.  
Germans reinforce their position around Orel, but fail to stop the Russian advance.
- 18 A third of Sicily now captured by Allied troops; entire Allied front moves forward.  
500 bombers pound Naples.  
Gen. Alexander takes over government of Sicily.  
Russian troops advance 4 miles closer to Orel.  
Allied planes attack Jap air base at Munda.
- 19 500 Allied planes bomb Rome military center for first time; lose 4 planes.  
Red Army now within 12 miles of Orel.
- 20 British Eighth Army meets strong resistance south of Catania, Sicily.  
US troops continue toward Santa Caterina.  
Russian troops cross the Donets and Mius Rivers.
- 21 US and Canadian troops capture Enna, take command of all communication networks leading to all parts of the island.  
Russians within 8 miles of the German Orel base.  
Heavy bombing of the Jap-held New Georgia bases continues.
- 22 Allied troops continue northern advance in Sicily. British Eighth Army advances slowly against strong resistance around Catania.  
Allied planes pound Italy.  
US troops on New Georgia Island advance closer to Munda.
- 23 Allies capture Palermo (capital of Sicily), trap 35,000 to 45,000 Italian troops in western Sicily.  
British Eighth Army continues ahead in the Catania area.  
Italy orders to arms all men 21 to 36 years of age.
- 24 US forces capture Marsala.  
British and Greek air forces raid Crete.  
Russians close in on Orel from the south.
- 25 Mussolini resigns, Marshal Badoglio takes over as Prime Minister.  
Allies continue to push ahead in Sicily.  
US 14th Air Force in China shoots down 45 Jap planes over Hunan Province bases.
- 26 Fierce resistance continues around Catania.  
Allied air forces make heavy raids on Hamburg, Hanover, Wilhelmshafen, and Wesermuende.  
Russians cut Bryansk-Orel railway, cross the Oka River.
- 27 Russian Army breaks through German defense south of Orel.  
US *Liberators* raid Jap position on Wake Island, destroy 18 planes.
- 28 Strikes for peace break out throughout Italy.  
Allies continue Sicilian advance.  
RAF and US air forces continue ferocious bombing of Germany.  
US planes bomb Wake Island for second time in four days
- 29 Allied troops capture Nicosia and Agira in northern Sicily.  
Navy reports that US submarines sank 10 Jap ships (including 2 large transports) and damaged 4 others.
- 30 Disorder breaks out in Milan in defiance of military authority.  
American Seventh Army drives the German northern flank into the mountains northwest of Troina.  
RAF raids Hamburg with 300 tons of bombs, Flying Fortresses raid Kassel and other German industrial cities; shoot down 61 planes and lose 39.
- 31 Allies send word to Italy that bombing will continue unless peace terms are met.  
Germans disarm Italian troops in Greece.

# BOOK REVIEWS



*THIRTY SECONDS OVER TOKYO.* By Capt. Ted W. Lawson, edited by Robert Considine. 221 pages; photographs; endpaper maps. Random House, \$2.00.

After an extraordinarily long period, details were released of Gen. Doolittle's raid on Tokyo in April, 1942. It is an amazing tale, full of "firsts"—B-25s flying from Navy carriers, hostile planes over Japan and her capital, crash landings in China, . . .

Capt. Lawson flew one of those planes. His plane, like most, was washed out in landing. He himself was horribly injured, but fortunately his crew was found by loyal Chinese and after many torturing miles were taken to a Chinese hospital. After a month's treatment they reached an air base by car, truck, jeep, coolies, and ricksha—and were flown back home.

The event was epic. Lawson's direct narrative is fascinating. Magnificent is the word for *Thirty Seconds Over Tokyo*.

*SPIN IN, DUMBWHACKS.* By Richard N. Ryan, Lt., AAF. 153 pages. J. B. Lippincott Co. \$1.75.

Truly a humorous writer, the author (an AAF lieutenant) gives you life of an Air Cadet from his first "processing week" until the glorious day when he receives his bars and wings. In witty style he gives a vivid picture of just how our military pilots are moulded, how they work, sweat, and work some more. Don't shy away because of the name. It's a delightful book! M. K. W.

*MEN IN MOTION.* By Henry J. Taylor. 296 pages; index. Doubleday, Doran & Co. \$3.00.

Here is a book for which I have been waiting. It is a dynamic masterpiece by a well informed author. The book is based on firsthand information that Mr. Taylor obtained by being at the right place at the right time. It clears up much of the mystery concerning the North African political affair. Another good account is the underlying reason why Rommel stopped at Alamein, when he might otherwise have advanced to take Alexandria and Cairo before the British could reinforce.

Mr. Taylor's opinions on the future are forceful. He aims a warning at our post-war policy makers who are promising the moon to our allies. In this respect his adversaries are mounting. His opinion that each country must get back to "self faith and integrity" before world peace and cooperation are assured sounds logical, and his other

thoughts should be a great lesson to all who read them. B. H. W.

*ONE WORLD.* By Wendell L. Willkie. 86 pages. Simon & Schuster. \$1.00 in paper, \$2.00 in cloth.

How would you like to travel 31,000 miles via air around the world? This book is about that trip—but in a sense not so much the trip itself as the conditions and people that it was Mr. Willkie's pleasure and privilege to observe.

The book is not written from a political point of view. It is written in true faith and honesty so that all who read it can grasp the feeling of sincerity that prompted him to tell his fellow Americans the truth for what he saw and heard. As one reviewer puts it, "It's not a book, it's a searchlight."  
B. H. W.

*THE LUFTWAFFE: Its Rise and Fall.* By Hauptmann Hermann. 294 pages; bibliography. G. P. Putnam's Sons. \$3.00.

Hauptmann Hermann is of course a pseudonym, but this writer was a German flier in the first World War, was a leader in building Germany's post-war aviation industry, knew well both the pioneers of German aviation and the Nazis who are now in power. This is his publisher's account, and it is vouched for by Curt Reiss (*Total Espionage*), who contributes an introduction.

This tale of the Luftwaffe starts on the very day of the Armistice, carries through the African defeat, and makes definite suggestions about what Germany will likely do in her death throes. It shows clearly how little, if anything, the Nazi party had to do with the rebirth of German aviation. And Hauptmann traces how the Nazis distorted and perverted in practice even their own theories as to what sort of air force they needed and how it should be used. As fascinating as any part of *The Luftwaffe* are the descriptions of those—some past, some still living—who were prominent in the industry, in the party, or both.

*LETTER FROM NEW GUINEA.* By Vern Haugland. 148 pages. Farrar & Rinehart, Inc. \$1.50.

Here is the full account of Associated Press Correspondent Vern Haugland's 42-day wanderings in the jungle of New Guinea. He describes the crossing of torrential rivers, endless rain, and the approach of starvation. As the certainty grew upon him that he would not survive, he found his faith in God and lost the fear of death. A truly interesting book.—M. K. W.

## DISCOUNT OFFER AND MAILING DATA

**FOR CASH WITH ORDER, the U. S. Field Artillery Association can obtain for its members 'most any books (texts, biographies, histories, fiction, etc.) at the following discounts:**

On orders amounting to at least \$2.50 ..... 10%

On orders amounting to \$10.00 or more ..... 15%

Remittances must be in U. S. funds; checks or money orders are safest. Please do not send foreign currency, as it "shrinks" amazingly.

No discount is possible on Government publications, however, nor on *Journal* subscriptions or Association memberships.

We pay book-rate postage.

Nothing can be sent C.O.D., or by insured or air mail, to A.P.O.s overseas. Such items as globes are too bulky for shipment to individuals overseas, as we are of course subject to Post Office Department Order No. 19687; for its detailed provisions, consult your local postmaster.

Between September 15 and October 15, Christmas gifts may be mailed overseas without showing the postmaster the addressee's request for the parcel. SO—minimize your family's wrapping and mailing problems by having them order books, maps, etc., through your Association. We will be glad to extend your members' discount to your family, and will, of course, see that all necessary special markings are put on your packages.



*LET THE PEOPLE KNOW.* By Norman Angell. Viking Press. 245 pages. \$2.50.

Although Mr. Angell has a tendency to apologize and to explain the British Empire out of existence, the solid worth of his book makes one forgive him for riding one of his pet hobby horses. *Let the People Know* is a frontal attack upon the isolationist point of view as it existed before the war, as it still exists, and as Mr. Angell fears it will continue to exist after the war. While he discusses many questions related to his theme, such as our relations with our Allies and the position of Asia in the future, the main current of his book circles about the problems of a collective international organization of all nations after the war and the social revolution. As a Socialist, Mr. Angell is much concerned about the future of the common man, but he is convinced that during the conduct of the war military necessity forbids any far reaching social changes. He even goes so far as to place the securing of international stability above the attainment of socialist goals. It is his view that social revolution is impossible without international security. The future lies in the hands of the people and they must be awakened to the necessity of close international cooperation after the war, or else it will have been fought in vain.

H. A.

*THE MAKING OF MODERN BRITAIN: A Short History.* By John Bartle: Brebner and Allan Nevins. 234 pages; maps; index. W. W. Norton & Co. \$2.50.

These two authors, distinguished history scholars of England and the United States, respectively, felt there was a place for a brief, modern, and readable survey of British history, based on scholarship but written for plain Americans. There is. And their book well fills it.

It also shows how much British history is a record of the growth of freedom and representative institutions, of the lawful achievements of the enterprise of both individuals and society as a whole, of the development of justice with adequate machinery for securing it for all.

This book gives a bird's-eye view. It is not stodgy nor fact-crammed, nor is it specialized. It is too short for that. But it is a direct, straight-forward narrative that will help set us all straight on our relationships with England, whether we are headed for that country or not.

*THE JAPANESE IN SOUTH AMERICA: An Introductory Survey with Special Reference to Peru.* By J. F. Normano and Antonello Gerbi. 126 pages; bibliography; index. The John Day Co. \$1.75.

How many Japs have gone to South America? How many returned home? What has the numerical trend been? What occupations are represented? What type of commerce has Japan sought in Latin America? Where are the Jap settlements? How strong are they, who runs them, and what is their political significance?

Two well-qualified men make a start toward the answers to such questions as these. Dr. Normano is research secretary of the Latin American Economic Institute, which is co-sponsor (with the Institute of Pacific Relations) of this book. Antonello Gerbi, an Italian economist, now resides in Lima, Peru, where his work has included extended studies of that country's Japanese communities.

*KHAKI IS MORE THAN A COLOR.* By Sgt. M. H. E. Marsden. 282 pages. Doubleday, Doran & Co. \$2.00.

Here is a book written by a sergeant who got his material from experience. Like millions of others, he was inducted into service because there was nothing else he could do about it. He was lonesome and homesick, but soon adjusted himself to the new army life and made the most of it.

Sgt. Marsden gives you a typical description of Army life from the first stages until the rise of the curtain of battle. He does not depict that life as too glamorous—instead, he tells about the strict discipline and hard work which is necessary in building an Army. His book is well written in the simple, everyday language which exemplifies a typical soldier.

B. H. W.

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*JEEPS AND JESTS.* By Bruce Bairnsfather. G. P. Putnam's Sons. \$2.00.

"Old Bill" and "The Better 'Ole" were last war's classic cartoons. Their creator has been roving through Ireland and North Africa as official cartoonist. He's lived and worked with our soldiers, bounced in jeeps and slept under leaky roofs with them; seen them on pass, and struggled through the Irish rains and gumbo. One result is a collection of 51 full-page drawings in wash, plus 52 smaller cartoons. They add up to more than just 103 illustrations—they're a humorous, rounded picture of life in the Emerald Isle, with both quiet chuckles and full belly-laughes. Oh, yes—Old Bill is still with us, but he's grown older with the years; now he's a member of the Home Guard.

*ISLANDS OF THE PACIFIC.* By Hawthorne Daniel. 215 pages; maps; index. G. P. Putnam's Sons. \$2.50.

Truk, Espiritu Santo, and Guadalcanal are but a few of the places unheard of a few months ago, now fully in the news. Many another island or atoll will gain fame in the months to come. We will want to know where they are and how they are built; what inhabitants they have, what government, resources, and language; what climate, and what fauna and flora.

Mr. Daniel gives us a good view of the vast sweep of islands of the Pacific, from Hawaii to the south and west and back via the Philippines, Japan, and the Aleutians. Larger and better known groups (such as the Dutch East Indies and the Philippines) are just mentioned in passing. Lesser islands are emphasized, those of which we know so little but many of which now have their American garrisons. This will be a fine book to have handy for reference in the days to come.

*ATTACK CAN WIN IN '43.* By Max Werner. 216 pages; maps. Little, Brown & Co. \$1.75.

Whether or not you agree with Mr. Werner's time estimate, you'll respect his examinations of pros and cons of the chances of Soviet and Nazi victory and defeat. It is refreshing, too, to find such a lucid statement of how the Axis never really effected a coalition for operations against the Allies.

*AMATEURS AT WAR: The American Soldier in Action.* Edited by Ben Ames Williams. 498 pages; maps. Houghton Mifflin Co. \$3.00.

*Amateurs at War* is not to be confused with Hemingway's *Men at War*. This new book is concerned only with the American soldier; it contains only fact, no fiction; and its tales of fighting were all told first-hand, soon after the particular actions.

Here are John Paul Jones's own account of his capture of the *Serapis*; Haskell's story of Pickett's charge, written while its memory was still sharp; Sgt. York's capture of a good chunk of the German army; and many another account of the way free men fight.

Each is preceded by a brief outline of the engagement, fitting it into the general picture. Result: a composite of the American amateur soldier, who through the years has gone ahead with his job unhampered by too many wrong, traditional ideas, and never knowing when he was beaten. Indian fighters on the early Maine frontier have a great deal in common with our Marines on Guadalcanal, and with all the citizen soldiers in between.

For a close-up picture of either fighters or their battles, *Amateurs at War* is excellent. Mr. Williams's judicious editing, by the way, makes the reading both easy and interesting.

*LOVE AT FIRST FLIGHT.* By Charles Spalding and Otis Carney. 160 pages; cartoons. Houghton Mifflin Co. \$2.00.

Ensign Dowd's pursuit of his wings makes up a most hilarious book. For an evening of pleasure reading this book is heartily recommended.—M. K. W.

*BRIDGEHEAD TO VICTORY.* By L. V. Randall. 183 pages; maps. Doubleday, Doran and Co., Inc. \$2.00.

In this fine little book for the layman, Mr. Randall takes a quick geostrategic swing among the various Axis and Axis-occupied countries, glancing at their terrain, climate, inhabitants, and invasion possibilities. He then outlines the manifold problems of any invasion anywhere: man power, transportation, weapons (both new and sham), publicity and propaganda, and the armed forces themselves. After paying his respects to various aspects of the tactics required, he looks at the eastern front and into the general strategic position. Finally, he details his own personal plan for an invasion, covering all possible areas.

Not only the folks at home, but our own troops should be glad to have this summary volume handy, for use in following events as they develop. Mr. Randall stays quite close to the beam, and obviously has studied his subject more than casually. Perhaps this is due in part to his claimed five years in the German army before and during the last war?

*"WILDCATS" OVER CASABLANCA.* By Lts. M. T. Wordell and E. N. Seiler, as told to Keith Ayling. 309 pages; endpaper map. Little, Brown and Co. \$2.50.

Seeing action for the first time, this squadron of Grumman fighters made history at Casablanca: for the first time anywhere, carrier-based planes supported invading troops and gained control of the air over hostile territory so ground forces could take over and pave the way for land planes brought overseas by carrier! It is a brisk, bubbling, exciting tale, told by partaking youngsters to our best-versed writer on aviation. Nothing is lost in the telling, for Keith Ayling is as fresh and vigorous as his collaborators.

A rounded picture, this—it is more than the flights and the dogfights. We see all that affected the actual operations. The ready-room, incidents aboard the carrier whether pilots were there or on missions, and events at the base are all covered, and all blended into one exciting whole.

Perhaps the highlight is the experience of Wordell after being shot down and taken prisoner. Much tripe has been published about French actions, reactions, and counter-actions in North Africa. Dismal and conflicting stories are still coming to light. Wordell gives in considerable detail his conversations, interviews, and treatment; they are revealing, especially in view of the subsequent (and continuing) confused political-military situation of the French.

*THE STORY OF DR. WASSELL.* By James Hilton. 158 pages. Little, Brown and Co. \$1.50.

*The Story of Dr. Wassell* is a true story of heroism achieved so naturally and simply that the hero himself was unaware of the outstanding quality of his performance, and was genuinely astonished by the recognition accorded him in the form of the Navy Cross.

In the same deft manner that distinguished *Goodbye, Mr. Chips* the author penetrates the moods and motives of the homespun Dr. Wassell. There had been much of physical hardship in the doctor's life, and some disappointments which had crystalized into a sort of philosophic humility rather than bitterness. He had been mildly unconventional in adapting his practice to the peculiar needs of his impoverished home community in Arkansas, and this had not advanced him professionally. His earnest efforts as a medical missionary in China, and, at another period, as medical officer of a CCC Camp, had somehow been dissipated by a combination of circumstances. In his middle fifties he looked back on a rather unsatisfying record of achievement.

Then quite by chance, friendlier than other chances in his life, he was assigned as liaison officer to an inland Dutch hospital in Java, caring for wounded men from the *Marblehead* and the *Houston*.

His loyalty and genuine devotion to the suffering men led him, by way of some embarrassment and confusion and the casual risking of his life, to the splendid achievements for which he was awarded the Navy Cross.

The story is told with a compelling simplicity that makes Dr. Wassell very real and delightfully human.

F. E. J.

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*KENDALL OF THE PICAYUNE.* By *Fayette Copeland*. 320 pages; bibliography; index; illustrated. University of Oklahoma Press. \$3.00.

Perhaps the most outstanding publisher of Americana, and best-known in the army as the publisher of Col. Nye's *Carbine and Lance*, the University of Oklahoma Press has just produced this biography of an outstanding frontiersman. More than that, he was publisher, first war correspondent the world had seen (when he covered our Mexican War), wide traveller, great booster of Texas and one of her greatest ranchers, and outstanding proponent of expansion of the United States. Kendall's life was never dull. Neither is this biography.

*SHORT CUT TO TOKYO.* By *Corey Ford*. 140 pages; maps. Charles Scribner's Sons. \$1.75.

Here is the first detailed account of the Japanese invasion that failed. It was planned to invade the United States by way of Alaska, but the heroic pilots of our Army Air Force stayed off the Nips in air battles and raids under the most perilous flying conditions in the world. Corey Ford appreciates the importance of the Aleutians; so does our high command; so also should we all.

M. K. W.

*ABRAHAM LINCOLN AND THE FIFTH COLUMN.* By *George Fort Milton*. 247 pages. Infantry Journal. 25c.

Originally published a year or so ago, this interesting and detailed book has just been re-issued in convenient pocket size.

*AIRBORNE INVASION.* By *John Hetherington*. 178 pages; maps. Duell, Sloan and Pearce. \$2.50.

At last we have the full, terrific, and gripping story of the Battle of Crete! Hetherington wrote with the benefit of official records, but equally important he checked his facts with literally scores of veterans of that fighting. Plainly, Crete was not the pushover the Germans made it out to be. Nazi losses were heavy—very, very heavy. And perhaps the invaders' reactions when matters went awry gives a clue to what they will do when even Berchtesgaden surrenders hope of victory. You see, seven months before Pearl Harbor and Bataan the Germans were out-Japping the Japs with their treachery, throwing grenades from hands upraised in surrender and ruthlessly slaying unarmed medical officers.

The whole story is here, from the "big picture" on down to the riflemen in the brush. It is worth careful scanning as a vivid action tale, for a picture of German, Greek, British, and New Zealander in action and reaction, for a clear understanding of one type of combat we will inevitably encounter when we invade mountainous islands or mainland.

*THE ARMISTICES OF 1918.* By *Sir Frederick Maurice*. 100 pages; index. Oxford University Press. \$2.00.

In 1918 the Allies were caught rather flat-footed when Germany sought an armistice. A myriad of questions had to be answered, and answered *now*. Many of them had not been anticipated, so inevitably some instantaneous solutions were later regretted.

This situation should not occur again. History should be able to point out some of the pitfalls, if not furnish proper solutions. Hence this documentation of the political and military negotiations involved in preparing the several armistices and in supervising their execution. Sir Frederick also has some suggestions concerning the machinery which must be set up to handle such matters when present hostilities draw to a close.

*The Armistices of 1918* is printed in Great Britain. It is unfortunate that its publisher often whets readers' appetites, then is forced to leave orders for various titles unfilled. This reviewer hopes it will soon make arrangements for domestic reproduction of some of its fine products.

## Journal Reprints

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*THE NAVY READER.* Edited by Lt. William Harrison Fetridge, USNR. 443 pages; illustrated. The Bobbs-Merrill Co. \$3.75.

Today's navy is perhaps the most important one we have had throughout our history. All sorts of books have been published about our navy in the past, but none have given a rounded picture of it as it exists today. Newspapers and magazines, however, have printed magnificent accounts by seagoing sailors, and from these sources the bulk of *The Navy Reader* has been compiled.

This is a book for every individual new to the navy, and for many who are not so new. It has a place in every army day-room, for before we have entered Berlin and Tokyo a great many more of us will get pretty intimately acquainted with our navy brothers. *The Navy Reader* gets us acquainted with the sailors, their language, life, and surroundings; with the different types of ships—what they are like and what they are for; naval aviation is well covered, too: types and purposes of planes, and how they do their job.

Some of the book's greatest value lies in its collection of first-hand battle accounts from the present war, from Wake Island to Alaska to Murmansk, and way-stations in between. These are by people who took part in these engagements, and plainly show that the day of "iron men" has not passed.

For a picture of our living navy of today, you can't find a better book than *The Navy Reader*.

*THE FIGHT FOR NEW GUINEA.* By Pat Robinson. 176 pages; index; photographs; endpaper maps. Random House. \$2.00.

Mr. Robinson was the first American correspondent to set foot in New Guinea. He gives us the story of Gen. MacArthur's first offensive, and how inch by inch it drove the Japs away from Port Moresby, over the Kokoda Trail, and finally cornered and destroyed them at Gona and Buna. M. K. W.

*HERE COME THE MARINES!* By Alexander R. Griffin. 211 pages. Howell, Soskin. \$2.00.

A quick, comprehensive once-over of highlights in the Marines' tumultuous history, from Tripoli through Montezuma to Wake Island.

*WHY JAPAN WAS STRONG.* By John Patric. 313 pages; endpaper maps. Doubleday, Doran & Co. \$2.50.

Mr. Patric takes you into the homes of typical Japanese families, to show what they are like and how they feel about their war with America. His is not an economic or a political study: it merely gives the facts as the author got them from his journeys among the people.

M. K. W.

*DUEL FOR THE NORTHLAND.* By Kurt Singer. 212 pages. Robert M. McBride and Co. \$2.75.

Born in Vienna in 1911, by his own account Kurt Singer has wandered into and lived in eight different countries. He spent considerable time in Scandinavia. His journalistic rise seems to have been on the meteoric side, for although he is now only 32 he claims some years ago to have known well many top leaders of and sympathizers with both the Nazi and Communist parties.

Singer has put together a comprehensive and fascinating account of Scandinavia's underground struggles, headed by Pflugk-Hartung on the one side and Wollweber on the other. All the lesser lights of any importance at all are outlined, and their mystery-thriller exploits detailed. On the surface the book is quite an exposé. But I felt an underlying question mark: some errors and inconsistencies make the whole thing a bit suspect.

For example, Singer is supposed to have had to flee Germany, leaving his wife as a hostage. How, then, did she and her daughter join him here?

Another case: two different Norwegians are flatly stated as having charge of the 25,000 Norwegian sailors employed aboard the 1,000 Norwegian ships in the service of the United Nations. On page 81 it is Haugen, but by page 90 it has become Haslund.

## Recommended Reading for Ambitious Artillerymen

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### THE WAR IN MAPS \$2.00

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North America .....	230	Western Pacific .....	280
South America .....	195		
Alaska .....	64		
Canada .....	132		
France .....	33		
Mediterranean Lands ....	124		

\*Oceania, 463; Australia, 240; New Zealand, 77.

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Perhaps there is some explanation for these first examples, but there can hardly be one for the third. Germany invaded Russia on June 22, 1941. On page 122 Singer says that evidence introduced in a propaganda trial which the Nazis started on July 7, 1941, "was obviously a part of a build-up by the Gestapo of a case against Russia in order to prepare Hitler's way for a declaration of war on Russia." Since when has Hitler needed or even wanted an excuse for such a declaration after his shooting started?

Again, Wollweber's Swedish trial was held in November, 1941 (page 142), soon after his arrest so the delicate matter could be settled before Germany's extradition demands became too vehement. Was Swedish justice really so speedy? or is Singer just mixed up on his dates again? On page 153 *et seq.* are outlined acts of violence dating from May 26, 1941—and supposedly occurring while Wollweber was in his prison cell.

If you overlook inconsistencies like these, you will enjoy a thriller comparable with Oppenheim's. And obviously the bulk of Singer's material is true, and of the sort with which we should be acquainted.

*DOCTORS AWEIGH.* By Rear Admiral Charles M. Oman. 231 pages; illustrated. Doubleday, Doran & Co. \$2.50.

This book tells us what our Naval Medical Corps can do and has done in action. It is a fine story of the sea, and contains information on the progress of Naval medicine and the care of men in the service.—M. K. W.

*HISTORY OF BIGOTRY IN THE UNITED STATES.* By Gustavus Myers. 495 pages; index. Random House. \$3.50.

Bigotry of the sort that produced Colonial witch-hunts continued through our history and still flourishes. This is not to say, however, that it was indigenous to this country or even limited to this hemisphere. Our Puritan ancestors brought it from Europe, even as Cortez carried it into countries to the south. Origins of bigotry are lost in antiquity, and its end may never come.

But we can do one positive thing about it—minimize its growth and effects. For this, we must be able to recognize its ugly snout, before the whole head has a chance to rear up. Knowledge of bigotry's more flamboyant moments, and the way it affected the populace, may stand us in good stead.

Here is where Mr. Myers's contribution fits in. He has gone back to the days of blue laws and witchcraft, and written a lively, highly readable account of bigotry through the years. Clashes of races and religions, strife between clergy and laymen, anti-fraternal movements, anti-democratic processes of all kinds are exposed for what they were—intolerant prejudice on the part of many, and sometimes even fostered by self-seeking demagogues who sought some personal advantage or perquisites. Yes, Mr. Myers brings his history down to date, and includes movements with which we are familiar: the Bund, Christian Front, Silver Shirts, and kindred organizations.

This is a fitting valedictory for Mr. Myers. His manuscript was completed just before his death last December.

*FIRST PRINCIPLES OF RADIO COMMUNICATIONS.* By Alfred P. Morgan. 353 pages; illustrated; index. D. Appleton-Century Co. \$3.00.

Alfred Morgan has written many books on elementary electricity, radio, chemistry, and electro-chemistry. A professional radio engineer, he is skilled both in his subject matter and in expressing his meaning clearly. This new book avoids higher mathematics, but lucidly explains step by step the underlying principles and their application to radio receivers and transmitters. It is concise, readable, and easily understandable.

*BUT SOLDIERS WONDERED WHY.* By Frank Gervasi. 266 pages. Doubleday, Doran & Co., Inc. \$2.75.

Mr. Gervasi, a *Collier's* correspondent, has travelled through South America, and was in Cairo in time to see the fall of Tobruk and in

Portuguese East Africa to meet the exchange ships bearing our diplomats and refugees. He is in a good position, and well enough informed, to suggest what victory and the consequent reforms will bring to South America and Africa.—M. K. W.

*CRYPTOGRAPHY: The Science of Secret Writing.* By Laurence Dwight Smith. 160 pages; index. W. W. Norton & Co. \$2.50.

All cryptography follows very definite patterns, otherwise a mere jumble would result. How transposition, substitution, and combination systems developed, and how they are applied today, is the theme of Mr. Smith's book. Problems, with answers, give the student a chance to apply his study, and also an opportunity to check his progress and evaluate his skill.

*THE FIGHTING FRENCH.* By Raoul Aglion. 315 pages; index; illustrated. Henry Holt and Co. \$3.00.

As its title implies, this is the story of those courageous men and women who kept the Frenchmen's spirit alive with organized underground movements. A price on their head meant nothing to them, so long as they could get word to the rest of the true Frenchmen that the spirit of France was not dead, but would live forever. Their quiet yet magnificent heroism is strikingly told.

B. H. W.

*COMBAT AVIATION.* By Keith Ayling. 253 pages; photographs; bibliography. Military Service Publishing Co. \$2.00.

In a clear, easy style Mr. Ayling gives a mighty good picture of fighter planes and their pilots, formations, tactics, armament, recognition, and the great masters of the game. Knowing his subject inside and out, he is able to write in non-technical style without in the least sounding as if he were trying to address a kindergarten. A perusal of *Combat Aviation* will give you a pretty good idea of the whys and wherefores of fighter flying. It is perhaps unfortunate that the photos did not reproduce more clearly, but they are at least sharp enough to give a good idea of the planes shown.

*OLD NAMELESS: The Epic of a U. S. Battlewagon.* By Sidney Shalett. 177 pages; photo; sketch. D. Appleton-Century Co. \$2.00.

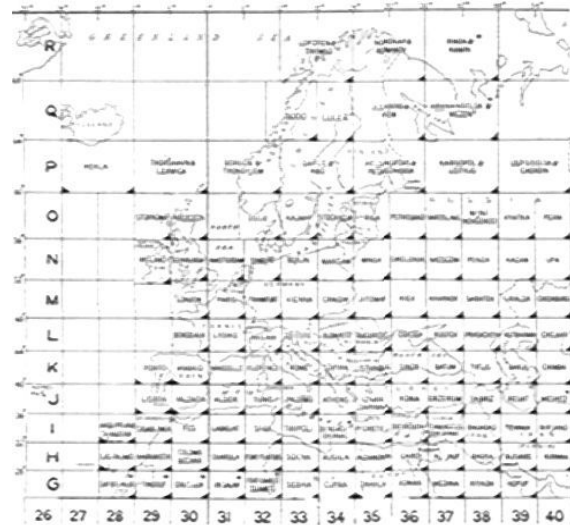
"Old" is a term of affection, for she is one of our newest, most powerful battleships. "Nameless" for security reasons, as the Nips are unsure of her true identity. But "Gatch" should be part of the title, as Capt. Thomas Leigh Gatch, USN, is an inseparable part of the achievements of this magnificent vessel.

Gatch and *Old Nameless* went to sea together. He obtained a command (from Washington desk duty) within a month of Pearl Harbor; his ship was newly launched and fitted. His crew grew up with his command, as 60% of his men enlisted only in January and February, 1942. Swiftly a perfect team was welded. All emphasis was on battle readiness, smooth seamanship and gunnery. Spit and polish took only second place. Every man aboard was enthusiastic and spoiling for combat. Filipino and Negro mess attendants asked for and received training in manning automatic AA guns; in the Battle of Santa Cruz they performed wonders.

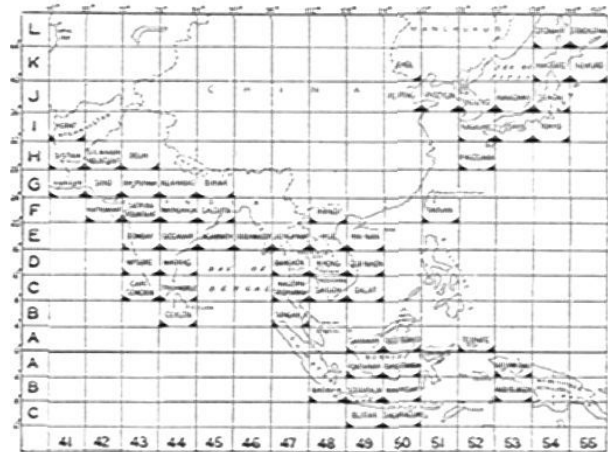
New ship and green crew first saw action on October 26th. Normal tactics were inverted—the battlewagon was protecting a carrier! The Japs launched three separate, coordinated air attacks against *Old Nameless*. In the first, 20 dive bombers were used; every one was shot down by the battleship's AA fire. The second and third combined dive bombers and torpedo planes, 64 in all. Altogether, 40 Jap planes were surely downed, and of these the battleship accounted for 32! One hit was scored on the ship, by a 500-pound bomb which struck a turret; worst of all, it seriously wounded Capt. Gatch—but he resumed command within three weeks, took his ship through her next trial, brought the vessel back home for repairs, and only then took real time off for recovery.

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Less than three weeks after her first battle, *Old Nameless* helped break the back of Japan's naval strength, in the night Battle of Guadalcanal. The strength of our new ships is astounding. *Old Nameless* took a terrific pounding, suffered tremendous damage and high casualties, but came through in fairly decent condition. Her crew's heroism, both individually and collectively, is a good index of why Japan must cry "uncle" as soon as our main effort can be turned in her direction.

Shallett has done a fine job in making this ship, her commander, and her crew live before your eyes. You can feel, smell, and touch the action. Naval accounts are often detached and impersonal, because of the trackless areas over which naval actions usually take place. Here, though, the action ties in with familiar land areas about Guadalcanal, and one gains a new appreciation of the interplay between land and sea engagements. It's a grand book.

*TRAINING THE VOICE FOR SPEECH.* By C. Raymond Van-Dusen. 207 pages; illustrated; appendices; index. McGraw-Hill Book Co., Inc. \$2.00.

*SPEECH FOR THE MILITARY.* By Cole S. Brembeck and Albert A. Rights. 149 pages; appendix; index. Stackpole Sons. \$1.20.

America's early history is of deeds. When words were used they were short, direct, to the point; statements were brief and well organized; without PA systems, voices had to carry well—and thus they were used. But we lately passed through an era of "the world owes me a living," and among the laziness thereby developed was a laziness of speech. Military educators have found a dual lack—improper use of the voice itself, and ignorance of how to organize and present ideas, instruction, etc. These two books are therefore a valued addition to current "war books," although at first thought their titles might not so indicate.

*Training the Voice for Speech* goes squarely to the root of the matter. It deals with the physical mechanics of the voice—pitch, tone, breathing, rate, monotony, intensity, and kindred items. It includes practical suggestions, and even selections the practice of which will help improve or even correct the voice. Dr. VanDusen is now on active duty as a captain in the AGD.

*Speech for the Military* is more concerned with organization and presentation of the subject-matter, and only incidentally touches on the production of sound. As a text on "public speaking" it is clear, direct, and forceful; many of its thoughts apply equally to a writer.

Attention to these two books will without doubt improve the delivery, poise, and forcefulness of any officer.

*MOSCOW DATELINE: 1941-1943.* By Henry C. Cassidy. 367 pages; index; endpaper maps. Houghton Mifflin Co. \$3.00.

Henry Cassidy has been around: Paris for the AP 1936-38; then the battle of the Ebro (covering the Spanish Republican side); in Paris when war broke, he was accredited to the front, where he was with the British; staying in Paris through the occupation, he went to Berlin by troop train and thence flew to Moscow. There he has been chief of AP's Bureau for nearly three years. More important, he has so gained the Reds' confidence that it was to him last fall that Stalin wrote two letters, one on the question of a second front, the other stating his reactions to our North African invasion.

*Moscow Dateline* is an intimate view of Russia's government, her people, and her phase of this war, from Germany's invasion through last winter's relief of Stalingrad and Leningrad. It is important, authoritative, and a fine piece of writing—a "must" to help complete one's picture of this war.

*SOUTH AMERICAN JOURNEY.* By Waldo Frank. 374 pages; appendices; index; maps. Duell, Sloan, & Pierce. \$3.00.

A well qualified Latin American traveller gives us our Latin American friends and their countries in an interesting, historical manner. The author shows us the continent, its countries, peoples, cities, types, and races.

M. K. W.



*WAR IN THE SUN.* By James Lansdale Hodson. 449 pages. Dial Press. \$3.00.

Small type is hard on the eyes, but it does permit a publisher to cram an amazing quantity into a book. I don't mind it so much, when it is as interesting as *War in the Sun*.

Mr. Hodson served through the last war, and has been a war correspondent through this one. In the late spring of '41 he sailed from England, and before returning nearly a year later had visited the Middle East, India, Burma, and North, South, and West Africa. He traveled in tanks, warships, and bombers.

But this is not a book of rewritten dispatches. Instead it is a travel diary, human, searching, and penetrating. Hodson tells not only what he saw but what he heard, read, thought. Result is a really intimate picture of the war in the areas he visited, and a composite portrait of sound and sensible Britishers. I thoroughly enjoyed it.

*PACIFIC BLACKOUT.* By John McCutcheon. 244 pages; maps. Dodd, Mead & Co. \$2.50.

Another CBS correspondent comes through, with a first-hand account of the fall of the Netherlands East Indies. He answers all the questions—are the natives and whites loyal to us? were the islands well protected? how did we lose them? *Pacific Blackout* is considerably more than "just another correspondent's yarn."

M. K. W.

*MOTHER RUSSIA.* By Maurice Hindus. 395 pages; illustrated. Doubleday, Doran & Co., Inc. \$3.50.

Maurice Hindus takes up the case for Russia again as he has done so ably before. In this book on Russia under the stress of war he brings to light instance after instance of patriotic fervor, heroism, and social-mindedness grown to full expression in the recent revolutionary period of the country.

The author reviews Russia's astonishing history since the 1917 revolution with candor and understanding. He admits the ruthlessness in methods of accomplishing political objectives, but he sees vastly more in the struggle than the immediate and spectacular means taken by these daring people to accomplish the ends they sought. He quotes a statement from a Russian official which expresses the political code of the revolution with fitting starkness: "Remember, in a revolution the fight is not always between right and wrong but between two rights, an old right and a new right, your right and my right. . . ."

Inevitably such a code in vigorous operation aroused the indignation of other peoples who, the author appears to believe, focused their shocked attention on the ruthless means without due regard for the social worth of the end.

Mr. Hindus has studied the Russians deliberately, and he accords them a generous measure of respect. There is a note of pride in his accounts of their technological achievements and in his evidences that their staunch spirit has survived the several violent stages of the country's development under the "new right."

His vivid account of young people, boys and girls in their teens, daring the wrath of a ruthless German army to engage in guerrilla warfare, is an almost incredible story of selfless devotion to the country's cause. He conveys the belief that the people generally are keenly aware of the country's social and political aims, and that their vigorous defense of the Russian way of life is an endorsement of these aims.—F. E. J.

*SLAVES NEED NO LEADERS.* By Walter M. Kotschnig. Oxford University Press. 275 pages; index. \$2.75.

Are you interested in the fashioning of the educational program after the war? If you are, then the contents of this book will be of great material value.

The book is divided into two parts. Part one takes into account the educational background between the two wars (1919-1939) and the Fascist war on education. Part two deals with the reconstruction of our educational system now and after the war.

The author, who is well qualified for this type of writing, should be

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highly commended for his achievement. He compares the Fascist "order" of education with that of the United Nations concept of freedom through learning. From his account you will understand how easy it has been for the different "orders" to maintain their following. Teaching paved the way.

A book for everyone, but especially recommended to those interested in or associated with educational functions or organizations.  
B. H. W.

*U. S. FOREIGN POLICY: Shield of the Republic.* By Walter Lippmann. 177 pages. Little, Brown & Co. \$1.50.

In the forthright manner of one who is sure of his ground Mr. Lippmann discusses United States foreign policy, or rather the startling lack of a foreign policy adapted to the scale of this country's foreign commitments. The noted columnist and author reviews America's history of expansion from the purchase of Alaska through the annexation of the Hawaiian Islands and the conquering of Guam to Spain's cession of the Philippine Islands.

The author then traces the outlines of the young Republic's commitments made up to February, 1899, in a significant summary: "The direct American commitment included the defense of territory from Alaska to Luzon, from Greenland to Brazil, from Canada to the Argentine." He deplors the fact that throughout the period of expanding commitments the country had held on to principles of foreign policy long since outgrown, that the few measures taken toward adequate defense and security had not been sustained. He adds up the facts to a stern conclusion that "the history of our foreign relations in the twentieth century is a story of failure. It is the story of our national failure to balance the commitments which were made in the nineteenth century. Because of that failure we have been compelled to fight two great unexpected wars for which we were unprepared."

When Mr. Lippmann has drawn this unflinching conclusion he proceeds to point the way toward a national remedy. His discussion of the elements of a sound, adequate foreign policy is clear and forceful. While it may not be entirely agreeable with many habits of American thought, it bears a stamp of realistic reasoning.

This book has a particular timeliness in relation to our post-war position in the scheme of things. The subject is one of vital concern to our country.—F. E. J.

*ON YOUR OWN: How to Take Care of Yourself in Wild Country.* By Samuel A. Graham and Earl C. O'Roke. 150 pages; illustrated. The University of Minnesota Press. \$2.00.

Here is a "must" manual for service man or sportsman. It's complete. It tells how to meet physical extremes; how to prevent and treat minor injuries and infections; how to find drinking water in the desert or on coral islands; what wild plants are edible—and how to recognize them; what to do about poisonous plants, dangerous animals, insects, and other pests; and many another useful point, especially for the tenderfoot in the woods or for one going into strange climes.

This little book is plain and direct. Its authors have had plenty of practical experience in the field. Now they are on the University of Michigan's faculty, as professor of economic zoology and associate professor of forest zoology. Their work is another fine example of how science and experience can be combined for the common good.

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