

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



IN THIS ISSUE:

*Tunisia*

JULY, 1943

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CONGRATULATIONS to the 30th Inf Div Arty! It has just broken all records for successful completion of its firing tests, even though it took them (1) 3 weeks earlier in its training period than the normally scheduled time, (2) on a range where it had never previously fired, (3) immediately after a 2-day movement from its permanent station. Furthermore there was not a single failure in any test. This outfit thoroughly deserved its commendation by army, corps, and division commanders.

SINCE FEBRUARY we have been publishing each month a traditional or unit field artillery song, in an effort to record permanently a comprehensive group of nostalgic or lung-busting songs. The end of the trail is now in sight, however. Unless additional words and music (with piano arrangement) are received before the end of July, this series will close with the 6th Field Artillery Song in the August JOURNAL. If you have any candidates for this group, don't tarry—send them in right away.

AUTHENTIC MATERIAL is coming in from the battle fronts and from defense installations. Those taking an interest in forwarding their experiences earn the heartfelt thanks and appreciation of all artillerymen. It is interesting to note, too, that overseas authors generally send in neater, more orderly, and better illustrated articles than do those nearer home, who presumably have better facilities at hand. Perhaps an answer is that combat experience has made them acutely aware of the importance of meticulous attention to detail.

In any case, though, the contributions of all are appreciated!

WE ARE SEEKING a top-notch photo of the 155-mm gun, M-1. It should make one feel the grace and power of this magnificent weapon, should be of a high pictorial standard, and must be suitable for reproduction. Have you a print to submit?

NUMBERED POSTAL DISTRICTS have been established in 178 cities, to speed the sorting and delivery of mail. Your association's address, for example, is now "1218 Connecticut Ave., Washington 6, D. C."

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# The Field Artillery Journal

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

**JULY, 1943—Vol. 33, No. 7**

	PAGE
FINALE IN TUNISIA.....	482
<i>By Col. Conrad H. Lanza</i>	
CLOSE SUPPORT IN TUNISIA .....	489
<i>By Lt. Col. P. W. Thompson, FA</i>	
IN TUNISIA'S MUD AND BLOOD .....	492
<i>By Maj. Gen. Lunsford Errett Oliver</i>	
BRITISH ARTILLERY ACTION IN TUNISIA.....	494
<i>By A British Artillery Officer</i>	
ENGINEER SURVEY .....	495
<i>By Lt. Col. W. C. Hall, CE</i>	
THE SIMPLE LIFE.....	498
<i>By Capt. E. A. Raymond, FA</i>	
HINTS TO A BATTERY COMMANDER GOING OVERSEAS .....	500
<i>By Capt. Misha N. Kadick, FA</i>	
THE TANK AND ITS ADVERSARY .....	501
<i>By Capt. Robert D. Hanson, Inf.</i>	
RE-BIRTH OF THE WAR ROCKET.....	506
<i>By Capt. Andrew Kamarck, FA</i>	
ROUTES INTO EUROPE, PART II .....	510
<i>By Col. Conrad H. Lanza</i>	
LET WELL ENOUGH ALONE!.....	518
<i>By Lt. Harold G. Miller, FA</i>	
PHOTO LUBRICATION CHARTS.....	520
<i>By Lt. Melvin L. Hart, FA</i>	
SEVENTY-SIXTH FIELD ARTILLERY SONG .....	521
<i>By Edith H. Ward</i>	
RICOCHE FIRE—INTERIM REPORT.....	522
<i>By Lt. Col. J. H. Bertman, FA</i>	
FIRING TESTS UNCOVER THE "WHAMMIES" .....	524
<i>By Maj. Harold E. Bisbort, FA</i>	
AWARDS OF ASSOCIATION MEDALS .....	527
PERIMETERS IN PARAGRAPHS .....	528
<i>By Col. Conrad H. Lanza</i>	
SURPRISE FIRE WITHOUT REGISTRATION .....	533
<i>By Col. Christiancy Pickett, FA</i>	
A SITE COMPUTER .....	534
<i>By Lt. Col. F. H. Skelly, FA</i>	
USEFUL POINTS FROM AUSTRIAN FIELD ARTILLERY .....	536
<i>By Lt. Frederick W. Hess, FA</i>	
ARTILLERY COURSE AT QUANTICO .....	538
<i>By Capt. J. R. Blackwell, U.S.M.C.</i>	
SEEK AND YE SHALL FIND.....	540
<i>By Lt. Paul Roberts, FA</i>	
TRAINING A MOTORIZED BATTERY .....	542
NOT IN THE BOOK .....	544
DIARY OF WAR EVENTS.....	545
FOR HEROISM AND SERVICE.....	546
BOOK REVIEWS.....	548

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At the beginning of the period the 122-mile front line was:

Cape Serrat (to Allies); thence south 30 miles to Oum Guerinat; thence east 7 miles to Djebel Elang; thence southeast 8 miles via Heidous (to Axis) to Foume St. Eloi (4 miles northeast of Medjez-el-Bab); thence south 18 miles to north of Bou Arada; thence south 16 miles to Djebel Mansour (to Axis); thence southeast 10 miles to Djebel Chirich; thence east 33 miles via Djebibina (in No Man's Land) and Enfidaville (to Axis), to the coast.

Allied forces constituted the 18th Group of Armies, commanded by the British Gen. Sir Harold R. L. G. Alexander. He had the following forces:

French Africa Corps	Africa Volunteer Division (mostly French refugees) and Morocco Division
U. S. II Corps	1st Armored Division and 1st, 9th, and 34th Infantry Divisions
British First Army	1st and 6th Armored Divisions, 4th Division, and several others
French XIX Corps	Tunis and Morocco Division, and Algiers and Constantine Division (remnants of 4 divisions consolidated into two)
British Eighth Army	50th and 51st Infantry Divisions, 2nd New Zealand Division, 4th India Division, 7th Armored Division
French Desert Corps	2 divisions of Fighting French, mostly native troops

In all there were 21 or 22 divisions (including four armored divisions), with a total strength of well over 350,000 men.

Axis forces constituted the Afrika Group of Armies, under Col. Gen. Jurgan von Arnim. His forces were:

Afrika Panzer Army	10th, 15th, and 21st Panzer Divisions, 90th and 164th Afrika Divisions (special reduced size motorized divisions), 334th Infantry Division, Hermann Goering Division (special Afrika type), Manteuffel Division (special engineer type)
1st Italian Army	131st Centauro Armored Division, 21st Trieste, 1st Superga, Spezia, Pistoia, Folgore, Giovani Fascisti Infantry Divisions.

In all 15 divisions (including 4 armored divisions) and a total strength, including services, of about 210,000 men.

The mission of the Axis was to defend the beachhead in Tunisia as long as possible. The mission of the Allies was to capture the beach at as early a date as practicable. To accomplish this Gen. Alexander decided to penetrate the enemy's center by a drive on Tunis and split his forces in two.

In preparation for the coming campaign the Air Force dropped numerous propaganda leaflets over the Axis lines. Those in German represented that the German troops had been left to cover the "escape" of Marshal Rommel, their previous commander, who had left Africa (ostensibly on sick report) about March 15th. It was stated that his troops were being sacrificed so that brass hats might live. Leaflets for Italians asserted that Marshal Rommel had fled, and that once more the Italians had been betrayed by the Germans. It was stated that the German troops intended to abandon their Italian comrades by sailing away in Italy's own ships. They were invited to "come over to us and save your lives."

A more effective preparation was the air combat program. The Allied air forces were a separate command under the British Air Vice Marshal Sir Arthur Coningham, whose CP was adjacent to that of Gen. Alexander, enabling close cooperation to be arranged between air and ground forces. The air force undertook a concentrated and daily series of attacks, by day and night, against enemy lines of supply across the sea to Tunisia; against enemy ports in Tunisia, Sicily, Sardinia, and Italy (including west Italy); and again all enemy airfields in Tunisian and Italian territory within operation range. British and American air forces based on Egypt and British air forces

# FINALE IIN

*April 16th to May 15th 1943*

based on Malta, participated in the program.

This air program had considerable success. Many enemy ships were sunk or damaged. Great destruction was caused at the base ports of Palermo, Trapani, and Messina, all in Sicily. Air bases of the enemy in Sicily and Sardinia were bombed to such an extent that there was a noticeable diminution of enemy air activity day by day, until finally (near the end of the campaign) few enemy planes were operating anywhere within this theater of operations.

In preparation for the coming attack, Gen. Alexander relieved the 50th and 51st Divisions and the 7th Armored Division from duty with the Eighth Army and moved them to the rear of the British First Army, to which they were assigned. The U. S. II Corps was relieved from line in the vicinity of Pont du Fahs, moved north, and replaced in line from near Sedjenane to the Tine River. The French XIX Corps was attached to the First Army, to whom was assigned the main effort in the proposed attack: to capture Tunis and split the enemy in two. The French XIX Corps and Desert Corps took over those sectors in the south made vacant by the withdrawal of the divisions sent northward.

The initial attack was made on the south side by the Eighth Army, with its reduced strength, attacking on both sides of Enfidaville on the night of April 19/20. Most of the artillery had remained to participate in the artillery preparation, which was unusually heavy and intended to induce the enemy to believe that the whole of that British army was still in his front. The infantry jumped off by moonlight, with restricted tank support. It got by Enfidaville. Circling toward that village, it entered it from the rear and soon had full possession. This part of the front was defended by the Italian Pistoia Division, which made several counterattacks during the ensuing day. These were continued on the 21st and 22nd, but the British held the village.

During the night of April 20/21 the enemy made an attack on Djebel El Ahmera, better known as Long Stop Hill, about 4 miles north of Medjez-el-Bab. The mission of this attack appears to have been to capture prisoners to determine what the Allies were going to do. This night battle was led by German tanks, the obscurity protecting them from most of the antitank gun fire. The enemy made an appreciable advance and captured several hundred prisoners. Fortunately these belonged to a division which had been in line for some time and not to any of the reinforcing divisions, so the enemy failed to find out about the new distribution of Allied troops. He himself lost about 500 prisoners, and 20 tanks (out of 33 present) were disabled.



# TUNISIA

By Col. Conrad H. Lanza

The British First Army, having received its new troops and been informed as to its mission, decided to attack Tunis by a double movement. One effort would be made from the vicinity of Medjez-el-Bab, directly toward Tunis. The second would be directed in a northeast direction from the sector about Bou Arada, also toward Tunis. It was hoped that by proper coordination of these attacks a substantial force of the enemy could be encircled in the flat country west and southwest of Tunis and captured.

A great part of the country in Tunisia is devoid of cover, hills being generally bare. Night attacks were therefore continued. On the night of April 21/22 the north British attack started with a preliminary operation of recovering Long Stop Hill. The artillery preparation commenced at 2000 and was followed by an infantry attack. This made an initial progress, taking about 300 prisoners, but it then encountered mine fields and its advance broke down. The south attack was launched on the 22nd near Bou Arada but immediately met a terrific artillery fire from the Italian Trieste and Folgore Divisions and was unable to make more than a minor advance.

On April 23rd one of the new infantry divisions made a new attack on Long Stop Hill, starting at dawn. This broke down under German artillery fire. In a second effort a ridge some distance below the summit was taken. British tanks then clambered up the hill, followed by a second division which leapfrogged the division stopped on the ridge. During the afternoon this attack reached the summit and held it despite a furious artillery fire. The south British attack was extended as far southward as Sebket el Kourzia. Led by armored troops, a slight advance was made.

The U. S. II Corps joined in the battle on this day. At 0300, by moonlight, it jumped off from near Djebel Abloud. The first part of its advance was cross flat land. It then ran into a number of smooth, round-topped hills; these hills were not steep, but there was almost a complete lack of cover. In the north sector the advance reached its objective by 1000, having taken about 100 prisoners and accomplished a gain of between 5 and 6 miles. The south sector was not so successful: our troops found the enemy holding right to hill 575, and by 1700 (when the battle died down) they were only halfway to the top. The American troops received strong support from their 105-mm and 155-mm batteries; the enemy used 88-mm guns. North of the Americans the French Morocco Division advanced to a line connecting with the left of the II Corps.

On the 24th there was fighting all along the front but with no appreciable gains anywhere except in the south, where the front was once more extended southward, French troops attacking and capturing Djebel Mansour (Hill 2,224.\*).

On April 25th the U. S. II Corps, having found it impracticable to advance the preceding day, attacked by night. The artillery preparation was fired by 14 batteries from 0200 until 0245 on a front of one division. The infantry met no opposition and reached their objectives, finding only one wounded German and one German straggler.

The First Army made its main effort down the north side of the Medjerda valley. Slight progress had been made here the day before, on both sides of Heidous. This day Heidous was completely isolated, and by dark the remnants of the garrison (which had been one battalion) surrendered. The British went 4 miles beyond—as far as Djebel Tangouch. On the south side of Medjerda valley raids were made without securing substantial changes in the line. East from Medjez-el-Bab French troops captured a ridge and held it.

The south attack made a decided gain. It got by Sebket el Kourzia and had a tank battle in which the enemy lost 14 tanks and was forced back. As it was believed that the enemy had no tank replacements, it was hoped that his armor had been so weakened that this attack would on the morrow be able to push further to the northeast and thereby threaten the rear of enemy forces facing Medjez-el-Bab.

Down near Enfidaville the Eighth Army was doing its best to attract the enemy's attention by continuous artillery and patrol activity.

The Allied Air Force was particularly active. Instead of attempting to furnish continuous overhead cover along the entire front, it gave it only where and when attacks took place. Then it was complete and effective. However, on request of regimental and higher commanders air bombing was undertaken invariably as desired, and usually within the hour.

Next day, the 26th, the battle was renewed along the entire front. The U. S. II Corps made two main attacks. The north attack was astride the road from Sedjenane to Mateur. With good artillery support this attack reached the vicinity of Jefna, through which ran the enemy's line. This town is in a hollow between two hills. About 3 miles to the north is Djebel Azag; the infantry almost reached its summit, but an enemy counterattack accompanied by severe artillery fire forced the Americans back to the base of the hill. Two miles south of Jefna is Djebel Ajred, which was captured and held by the Americans.

The south American attack was astride the road from Beja to Mateur. The road is in a valley, with a ridge on each side. Engineer troops advanced down the valley and removed great quantities of mines. Infantry attacked along the ridges. By night they were in the vicinity of Sidi Nsir, holding Djebel Meftah on the north and Djebel Smala on the south.

Between the north and south attacks the enemy held Djebel Auntra, about 8 miles from Jefna toward Sidi Nsir. The II Corps' advance was made cautiously, against strong opposition. At the end of the day the American artillery had been firing almost continuously, day and night, since 0200 of the 25th.

The French Africa Corps advanced in conformity with the American advance.

The British First Army also made two main attacks. The north attack was around Medjez-el-Bab, in a wide circle with that village as a center. Although the British had held the crest of Long Stop Hill since the 23rd, the enemy held all the

\*Heights of Tunisian hills, unless otherwise stated, are in feet.

rest of his side. An attack launched in the morning cleared off the German defenders (who amounted to about a battalion) and resulted in the capture of 260 prisoners.

The British were unable to advance along the north side of the Medjerda valley: the enemy held Djebel Bou Aoukaz on the south side, which hill dominated the surrounding country. It was found impossible to push forward as long as the enemy held this position. South of this 2,200-foot hill the British were unable to advance beyond Sidi Medien, on the direct road to Tunis. In view of this situation the British massed troops for a major attack against Djebel Bou Aoukaz.

The south British attack, in which French troops participated, was launched in the vicinity of Pont du Fahs to exploit the success of the previous day against the enemy's armor. Armored troops moved northeast between Sebket el Kourzia and Pont du Fahs, and had a severe engagement with enemy armored forces. An advance of 2 to 3 miles was made, but at a cost of many armored vehicles. According to enemy reports over 100 were lost, while the Allies claimed the loss of only 20 German tanks. South of Pont du Fahs French troops advanced across the road from Djebelina.

The Axis High Command seemed to fear an attack from the British Eighth Army in front of Enfidaville. The Italian infantry in this sector was strengthened, more artillery (which included 210-mm batteries) was placed in line, and armored troops were posted well to the rear to counterattack any hostile penetrations. The Eighth Army, however, made no attack, as its mission was only to demonstrate.

On April 27th the Allies continued the general advance. The U. S. II Corps attacked astride its two roads, slowly, due to clearing of mines and severe enemy shelling. An assault against Djebel Azag (Bald Hill) north of Jefna failed, while the enemy pushed the Americans off Djebel Ajrad (Green Hill) south of Jefna.

Near Sidi Nsir the Americans enlarged their hold on Djebel Meftah, southeast of that town, and made some advance south of the road. In spite of severe fighting and considerable losses the line remained substantially unchanged throughout the Corps front.

The British First Army made its main effort against Djebel Bou Aoukaz, judged to be the key to further progress eastward.

At 1545 an air preparation covered the hill with bombs. At 1600 the artillery preparation, fired by approximately 100 batteries, started. The fire was so heavy that the hill resembled a volcano, belching forth fire and smoke over its entire front slope. The infantry jumped off under protection of a rolling barrage and powerful air cover. Unusually strong resistance was met from the very beginning, the enemy's artillery fire being intense and costly in casualties.

The enemy had not fortified the front slopes of the hill. Only minor detachments, including OPs and machine gun nests, were on this side. The main infantry was on the reverse slope and was equipped with numerous infantry mortars which fired over the crest. The German artillery was at least 3,500 meters in rear of the hill, where it was possible for the guns to clear the hill and sweep the forward slope up which the attackers were

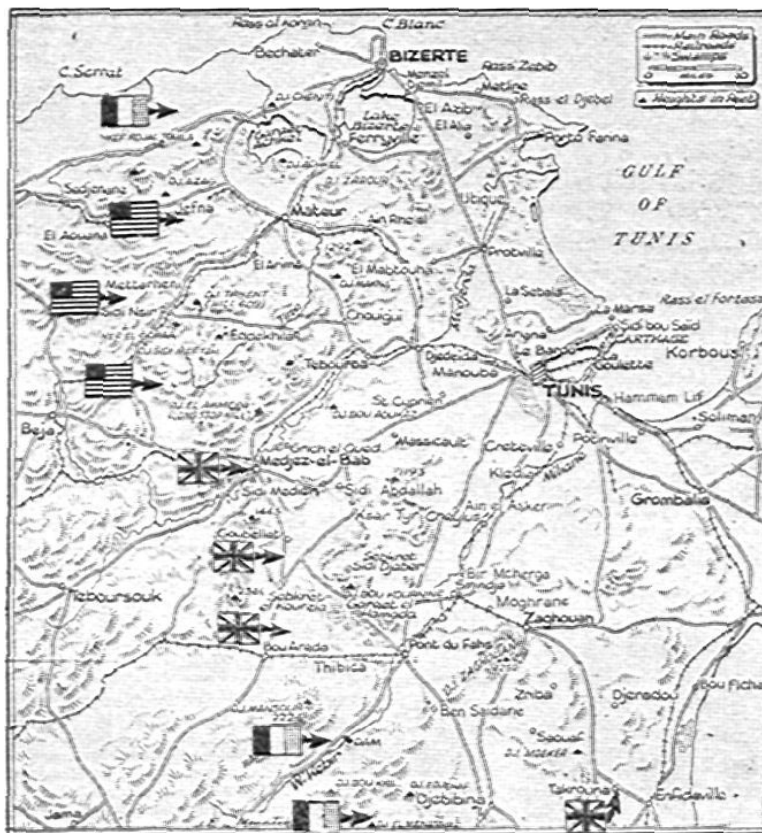
coming. Most of the enemy troops appear to have escaped both the air and artillery preparations.

The battle was stubborn and costly. By night the British had arrived within some 150 yards of the summit, but mortar and artillery fire was so constant and accurate that they were unable to hold it; under cover of darkness the troops fell back. From prisoners it was ascertained that the enemy opposite had arrived in Tunisia but two weeks before. This gave Headquarters the impression that the Axis was reinforcing its armies and would continue to defend Tunisia as long as possible.

The British south attack, near Pont du Fahs, which had had the

mission of pushing toward Tunis and thereby turn the enemy's defenses covering that city to the west, failed to make any progress. As near as can be ascertained the tank losses of the preceding days had been too heavy. Again the French in this area had the greater success. Attacking south of Pont du Fahs, they reached the west slope of Djebel el Zaghouan (4,250 feet), the highest mountain in this part of Tunisia.

On the morning of the 28th the Allied Air Force attacked the enemy's artillery east of Djebel Bou Aoukaz. Then British infantry again attacked under cover of their artillery. This attack was cut to pieces. Notwithstanding the air and artillery preparations, the enemy's fire was overwhelming. Only a few men reached a line within 400 yards of the summit. These managed to hold on. A new attack wave was sent forward.



This in spite of high losses carried to the crest and held it. The fight had been of unsurpassed ferocity and did not cease for a minute after the objective had been obtained. It kept right on.

In early afternoon the British were attacked by the enemy, but he was beaten off with no change in positions. British armor moved up on the left and advanced around the north end of Djebel Bou Aoukaz. It had an initial success and went into and through the German line in this vicinity. This attack was not pushed. Enemy armor held in reserve outside of the forward zone came up and attacked the British armor. In a savage fight the British withdrew. The German tanks then turned south and attacked Djebel Bou Aoukaz from the north, with the support of a battalion of infantry, numbering about 500 men. The British were forced off the crest of the hill and part way down.

The British attack north of Pont du Fahs, before dawn, made a new attempt to get the offensive toward Tunis going. This was made against Djebel Bou Kournine and captured part of the foreground of the enemy's line of resistance. At daylight enemy artillery severely shelled the British. Reinforcements were sent forward and an assault started. It failed, and the losses were so heavy it was deemed advisable to abandon the initial gains. The French on the other side of Pont du Fahs made new gains as usual, taking most of Djebel Derhafla (1,712 feet), south of Djebel Zaghuan.

The U. S. II Corps had bitter fighting. It continued its attacks along the two roads leading to Mateur. Near Jefna, repeated and game attacks throughout the day made gains but were unable to drive the enemy completely off Djebel Ajrad, south of Jefna.

South and southeast of Sidi Nsir better progress was made. Djebel Sidi Meftah was cleared of the enemy, and Djebel Badjar (to its north) was captured. Possession of these hills gave good observation to the east. Capture of these positions involved heavy losses. The greatest difficulty of the advancing troops was the enemy artillery and mortar fire, which was heavy and accurate. As the terrain was rocky, bursting shells split off chunks of rock which caused many casualties.

The II Corps decided to make its major effort of the 29th against what appeared to be the enemy's main position covering Mateur. This was Djebel Tahent, often referred to as Hill 609 (its height is 609 meters, equal to 1,998 feet). The successes of the previous day had afforded an opportunity for an envelopment from the south. The battle started at dawn, the artillery shelling the hill with all guns available. The air force bombed it. From prisoners' statements, it was estimated that the enemy had only about two weak companies on the hill, their total force being under 200 men.

The hill dominated the surrounding country, and with good visibility the enemy was able to observe the attack and direct his artillery fire with good effect. The Americans fought their way forward, in and out among the bare rocks, always under heavy fire, until they had built up a line about halfway up the hill. They held it during the day, but were unable to advance. Late in the afternoon the enemy reinforced his artillery with a terrific fire of machine guns and mortars. A large number of men were killed and wounded. The Germans came forward, and the American line was forced back to in rear of three small hills at the base which had been captured early in the morning.

Around Jefna an advance was made on the south side over Djebel Ajrad, and in the intervening sector to Sidi Nsir. The French Africa Corps advanced about 4 kilometers along the coast.

Severe fighting occurred all day around Djebel Bou Aoukaz, with the enemy as the aggressors. Several attacks on the morning failed to drive the British off the hill. In the afternoon a German attack, delivered by about 1,000 infantry led by some 40 tanks, attacked the hill from the south and east. This drove the British back, only a few remaining on the lower slopes. The German tanks kept on toward the north, and traversing the sector arrived in the Medjerda valley. British reserves, including armor hastily brought up, counterattacked the Germans and the latter retreated south, but they retained practically all of Djebel Bou Aoukaz. In this tank fight the Germans claim that within the 30 minutes that it lasted 21 British and American model tanks had been destroyed by their huge Mark VI Tiger tanks and 17 additional tanks had been destroyed in this vicinity during the rest of the day. After dark the enemy continued to attack what few British remained about Djebel Bou Aoukaz.

The British attack near Pont du Fahs was renewed on the same plan as the day before. Once more a night attack gained an advance into the enemy's foreground near Djebel Bou Kournine, with exactly the same result as on the preceding day. As soon as the sun came up the Axis artillery opened an accurate and intense fire on the advanced British. As before, to avoid excessive losses the troops were withdrawn to their original positions. Once more the French advanced; south of Pont du Fahs they arrived at the summit of Djebel Derhafla.

On the 30th the enemy continued to be the aggressors. About 1000, new German attacks were made in the Djebel Bou Aoukaz sector. A considerable number of tanks were used and the British fell back slightly, fighting savagely all the time. In the Medjerda valley, three German attacks were stopped. Due east from Medjez-el-Bab, along the road to Tunis, the German attacks were so persistent that the aid of the Air Force had to be invoked. For three hours American planes bombed the assailants. The general result of this battle left the situation nearly unchanged.

The British renewed once more their attack north of Sebket el Kourzia, but it had no more success than on previous days. It was now clear that the plan to push a strong armored force through the enemy's line northeastward into Tunis would not work. Consequently this plan was abandoned and the British decided to make a new main effort from Medjez-el-Bab directly toward Tunis, without counting on an advance further south.

Everywhere else the front was active on the last day of April, with considerable air, artillery, and patrol activity, but there was no important change.

It was now decided to regroup the British forces and prepare for a new advance straight from Medjez-el-Bab to Tunis. A few days would be required for the necessary preparations. At the same time the enemy decided to regroup also. His plan was to abandon Bizerte, in view of the slow but steady American advance toward Mateur, and withdraw from that area to the south where the Axis lines had held in general.

On May 1st both sides, engaged in arranging new dispositions, announced a lull in the battle. It was far from being a peaceful day however. The U. S. II Corps began a new attack against Djebel Tahent (Hill 609), and were surprised to find little opposition. The hill was taken. An attack farther east against another hill met very strong resistance and failed, the leading American battalion suffering heavily. The enemy's

artillery interdiction fire along roads was so strong that the forward troops had their food and ammunition dropped from the air. Including the French Africa Corps, some 600 prisoners were captured.

The British First Army made some local adjustments in their lines, involving minor advances. There was one exception: near Goubellat it was the enemy who advanced about a mile.

Commencing this day the enemy moved stores by truck out of Bizerte, south through Tunis. It is not yet known what induced the enemy to abandon this area. It is possible that the air force activity against sea lines of communication and against transport planes had caused a shortage of Axis supplies



*In North Africa the French took to our 105 like ducks to water.*

and required a shortening of the front. If this were the case, the shortest front possible would be across the base of the Cape Bon peninsula. Gen. von Arnim formed the impression that the main Allied attack would come from the south, and he massed the greater part of his available forces in that direction. He intended to make a strong defense here, under cover of which he would withdraw from the north.

The Axis dispositions ordered in pursuance of this plan were:

a. An immediate but orderly withdrawal from Bizerte. The Axis troops in this area were about 3 divisions: 334th, 15th Panzer, and Manteuffel Engineer Divisions. Against them were the French Africa Corps with 2 divisions and the U. S. II Corps with 4 divisions (including 1 armored division). Making no allowance for differences in strengths of divisions, the Axis was in this sector outnumbered 2 to 1.

b. A holding operation against the Allies on the Medjez-el-Bab front, by 2 divisions (the Hermann Goering and the Folgore Divisions). No armored troops were on this front, other than small detachments. Against this force, unknown to Gen. von Arnim, the main British attack was preparing with the following divisions, all British: 1st Armored, 6th Armored, 7th Armored, 50th, 51st, and about 4 other divisions. Here the British outnumbered the enemy by about 9 to 2—it was to be the decisive sector.

c. In the south the Axis main force would actively oppose the expected attack. Here were concentrated under the Italian 1st Army the 10th Panzer, 21st Panzer, 90th Motorized, 164th Motorized German Divisions, 5 Italian Divisions, and the Italian Sahara Group, the equivalent of 10 divisions. Against this the Allies had the French XIX Corps with 1 British and 2 French Divisions, the French Desert Corps of 2 divisions, and the British Eighth Army with 2 or 3 divisions—in all, not over 8 Allied Divisions.

The Axis had no general reserve, and nothing in the vicinity of Tunis—where unknown to him the main attack was coming.

On May 2nd there was a general lull in the battle. Only at the extreme flanks did changes occur. The French Africa Corps

advanced along the coast to a line between Lake Achkel and the sea, taking 500 prisoners. The French XIX Corps, south of Pont du Fahs, continued its slow and steady advance and by night reached the west outskirts of Saouaf.

Next day the U. S. II Corps suspected the enemy was leaving its front. It made a general advance along its entire front. Only small hostile forces were encountered, who netted 200 prisoners. Mateur was entered without opposition at 1100. The British First Army sent patrols east from the Medjez-el-Bab sector, who reported the enemy in position. Pending the proposed direct assault toward Tunis, the patrol activity was not pushed.

On May 4th the U. S. II Corps pushed forward cautiously to a point about halfway from Mateur to Ferryville. Other detachments advanced toward Tebourba from the north. At the same time British troops in the Medjerda valley also advanced toward Tebourba. This town was held by the 15th Panzer Division, which was holding the territory between the Bizerte and Tunis groups. This German force, while holding against the Americans, counterattacked the British, who were stopped on a line about 1½ miles from where they had started; the Germans used 17 tanks in this affair and lost 12. This little action gave the Allies valuable information as to the deployment of the enemy's forces.

May 5th the British First Army knew that it would be ready the following day to deliver a major attack. The plan was to overwhelm the two hostile divisions barring the way to Tunis, push rapidly into that town, and cut the enemy forces in two. The separated parts could then be dealt with later in such order and manner as circumstances indicated. It was decided to take Djebel Bou Aoukaz as a preliminary measure that very afternoon. For this purpose 100 batteries were detailed to fire the artillery preparation, concentrated on a front of 3,000 yards. This gave over 13 guns to each hundred yards' front, and this was supplemented by an intense air preparation. The combined air and artillery preparation smothered Djebel Bou Aoukaz in a hurricane of shells and bombs. Care was taken this time to have the preparation cover the rear slope of the hill. Behind a rolling barrage, armored troops preceded infantry in an attack up and over the long-contested hill. This time the artillery and air forces had accomplished their missions well, and the attack went home. By night all of Djebel Bou Aoukaz was in British hands.

As soon as this was accomplished and darkness had settled down, British troops moved forward to the positions from which they were to jump off early the next morning. The artillery displaced forward and worked out the necessary tables for firing a new preparation.

During this day the American troops had ascertained from questioning civilians living in the country recently taken that each night large numbers of trucks of the German Afrika Corps, all heavily laden, had been proceeding from Bizerte southward through Tunis. Allied Headquarters therefore judged that the enemy would not defend the Bizerte sector, and might not defend Tunis. It was assumed that he intended to retire to the Cape Bon peninsula. It was therefore desirable that the attack toward Tunis be in no way delayed, otherwise the bird might be found to have flown when the trap closed.

In the night of 5/6 May, at 0300, the great British attack was launched on a 10-mile front, from the road from Mejez-el-Bab to Tebourba on the north, in front of Djebel Bou Aoukaz



(now an excellent Allied OP), to the road from Medjez-el-Bab to Massicault on the south. The Air Force made special arrangements to drive enemy planes out of the sector of the attack. They succeeded so well that long British columns of batteries and trains moved safely in close order on main roads without being bombed.

The formation of the attack was two armored divisions in the center (7th and 6th from left to right), with infantry divisions on the flanks. Attacking before dawn prevented the enemy's artillery from adjusting fire on the movement. The rate of advance was planned to place the tanks within the artillery line before daylight. Infantry divisions were to prevent the armor from being subject to antitank gun fire from the flanks. The British attack was successful from the start. It was preceded by air bombings and its own artillery preparation which blasted a way for the tanks, who went through the hostile main line of resistance and on into his artillery zone.

When day came the enemy, having lost Djebel Bou Aoukaz, was left in flat country, covered with waist-high wheat or other cultivated fields. He had no good OPs left. Deprived of his air reconnaissance, he was unable to keep track of events. British troops were advised of the location of the enemy, but the enemy learned nothing of the British attack until it was on them. Tanks arrived in the enemy rear areas and captured the CPs or caused them to flee. Axis forward troops lost communication with regimental and higher commanders and were unable to obtain orders or information as to the situation. Their resistance became uncoordinated or ceased entirely.

British tanks did not stop to overcome centers of resistance. These were by-passed and left to the following infantry divisions. The tanks pushed ahead steadily and by night had arrived on the line Tebourba (exc.)—Massicault (inc.). Tank losses had been only twelve.

On May 7th the British attack was resumed. Complete air cover was again provided, and roads were available for columns in close order. By-passing enemy elements who resisted, the British tanks moved around and headed for the sea on a broad front. Infantry divisions followed. The 7th Armored Division, on the north, met the least resistance and arrived at the north exit of Tunis at 1450. Overcoming weak enemy detachments here, the tanks entered Tunis at 1620. They were so little expected that German officers and men were calmly walking in the streets, in shops, in taverns, etc. They had had no notice that their line had been penetrated or that Allied armored troops were even near Tunis.

The 6th Armored Division encountered resistance with enemy armor near St. Cyrien. In rain and through wheat the tanks moved forward, halted, fired, and advanced again. The enemy was driven back and the advance continued by all roads and paths toward Tunis. Shortly British troops were arriving on the coast from many directions and pouring into Tunis. The Axis, completely surprised, had neither plan nor troops to meet this situation. Isolated resistances by scattered guard detachments were overcome. Those of the enemy who could, fled southward.

Axis Headquarters may have intended to evacuate Tunis, but it was not prepared to do so on this date. The arrival of the British was entirely unexpected and found a large number of

troops to the north—who had indeed abandoned Bizerte according to plan, but who had not cleared Tunis. These numbered about 30,000 men.

After news of the rapid British advance had become known around noon, the U. S. II Corps moved forward from its positions west of Ferryville, anticipating that the enemy had withdrawn. Ferryville was occupied by 1600, no enemy being found. A motorized battalion pushed on at once and reached Bizerte at 1615. At about the same time the French Africa



*From this photograph we can get an excellent idea of northern Tunisian terrain. "Tommy" sergeant is observing Mateur, in the distance, near which the hills and mountains give way to the coastal plain.*

Corps arrived at the outskirts of Bizerte further to the north. Some enemy was in Bizerte. These were small posts, equipped with machine and tommy guns, suitably distributed at street intersections and other critical points. The enemy's rear guard was south of the ship channel leading into Lake Bizerte; it occupied the peninsula between the lake and the Mediterranean. It had a fair number of 40-mm guns and machine guns posted to enfilade the streets in Bizerte which ran perpendicular to the ship channel. What with the snipers in the town and the rear guard outside, the position of the weak American force was uncomfortable. At 2100 it withdrew, leaving Bizerte temporarily in possession of the enemy.

On the morning of the 8th the Americans reentered Bizerte, finding small enemy posts still in the town. The 1st Armored Division started to reduce the enemy-occupied houses and completed this task by early afternoon. Other detachments of this division crossed the ship channel and, attacking the enemy's rear guard, advanced to El Alia. The last act of the enemy in this vicinity was the demolition of the power house at 1415.

The British First Army engaged in reducing enemy centers of resistance which had been by-passed the day before in the rapid advance on Tunis. The most important of these was Tebourba, which fell after a slight resistance. The British 6th Armored Division, in Tunis, moved south along the coast. Other British troops on its right also moved in the same direction,

to the line of the Miliane River. No serious resistance was encountered. Enemy troops were found who had lost their headquarters, knew nothing of the situation, were locally out of ammunition and food. During the day about 20,000 prisoners were gathered in.

In the south the enemy was unaffected by the disaster which had befallen him in the north and was still fighting strongly. A French attack on Zaghouan Hill made progress, but only against violent and effective resistance.

German sources indicate that either on this day or possibly late on the 7th orders were sent to Col. Gen. von Arnim to resist to the last cartridge. This order did not materially affect the situation, for the general confusion within the Axis lines made it impossible to reestablish a new fighting front if we continued our pressure. Gen. von Arnim ordered the 10th Panzer Division from the south to Tunis.

The British had no intention of relaxing their pressure. On the 9th an attack was made all along the line of the Miliane River. To prevent any reinforcements being sent to this sector from the south, this was everywhere attacked. The south sector enemy fought hard. French troops completed conquest of about half of Zaghouan Hill; they also took Pont du Fahs and advanced about 5 miles beyond on a broad front astride the road to Tunis.

The German troops north of Tunis, caught between the 1st American Armored Division (on the north) and the 7th British Armored Division (moving northward from the vicinity of Tunis), hoisted the white flag early and at 1100 surrendered to the U. S. II Corps. This eliminated all hostile resistance north of the Miliane River. About 25,000 prisoners were thus taken.

On May 10th the British attack along the Miliane was pushed. Two armored divisions—the 1st and 6th, from right to left—broke through the Axis front along the lower part of the Miliane, between Creteville and the sea. Once through, resistance was only occasional and uncoordinated. By night the 6th Armored Division had reached Beni-Khalled, the 1st Armored Division was south of Grombalia. The second line infantry held Grombalia, Menzel-bou-Zalfa, and Soliman.

The British Eighth Army attacked all along the front. On its right, the attack made by one division broke down under the resistance of Italian troops. In the center no serious attack was made, as previous experience had shown that the enemy's artillery fire was very severe around Enfidaville. The left division attacked toward Saouaf and made progress.

Further north French troops continued their attack in the Zaghouan area. They made a slow advance, and at nightfall were 7 miles southwest of the Zaghouan town. A message was here received from the Axis commander asking for an armistice. In the south attacks a few hundred prisoners had been taken, but in general the enemy was far from disorganized.

On May 11th the enemy in the south facing the French, finding their rear completely exposed to Allied troops advancing from the north, surrendered. They numbered about 25,000 men in line. The British 6th Armored Division completed the cutting of the base of the Cape Bon peninsula in the morning and motor patrols made a circuit of the peninsula, finding no organized body of troops therein. The Axis had not had time to withdraw to this area. About 35,000 other Axis troops surrendered near the base of the peninsula. The only

body of enemy troops resisting was the Italian divisions facing the British Eighth Army.

On May 12th this Italian force was still resisting from positions just north of Enfidaville. A French division attacking their right was repulsed and then counterattacked. The Air Force, being called upon for aid, made a strong bombing attack at 1530, supported by all the artillery whose fire could be brought to bear.

Not far north from where these Italians were fighting Col. Gen. von Arnim was captured by a detachment of the 4th India Division (from the Eighth Army), some miles east from Zaghouan town. He apparently expected to be captured. He had just sent a radio despatch to Germany stating ". . . the order to defend Tunisia to the last cartridge has been carried out. Everything has been destroyed. This CP is closing." von Arnim was given an opportunity to sign a surrender, the terms of which provided that

- a. All resistance cease,
- b. All destruction of arms and other property to cease at once,
- c. Axis headquarters to furnish complete information as to location of mine fields, if any.

von Arnim declined to sign anything, and he never did. It made no difference. As soon as news came to the Italians near Enfidaville that the C-in-C had been captured and that they were now completely surrounded, they surrendered.

On the morning of the 13th the last Axis troops gave in and resistance ceased. The Tunisia campaign was at an end.

#### COMMENTS

The defeat of the Axis came sooner than had generally been expected. It was due to the break-through of the British First Army on May 6th and 7th along the line Medjez-el-Bab to Tunis. The Axis command made the same error here as had occurred in Russia in November, 1942: there were no reserves back of the front. When, therefore, the British armored troops arrived in Axis rear areas, they met but slight opposition, and by occupying and capturing command posts, lines of communication, and depots of supplies, were able to quickly disorganize the entire Axis command. Troops in line, finding themselves apparently abandoned, without leaders or orders, and with no supplies, either fought not at all or in a disconnected manner against superior forces who in succession surrounded and reduced any hostile bodies resisting.

The British, by providing a second line of troops in rear of the armored troops and with perfect information as to the situation, could by-pass or attack in any convenient order such hostile forces as they desired. Both on the offensive and on the defensive, a second line of troops is necessary. Its composition and strength are to be determined according to the situation and mission. If there is no second line a break in the front led by enemy armored troops in force runs the risk of causing a disaster—as has now twice happened to Axis commands: in Russia and in Tunisia.

Contributory to the Axis defeat was the air superiority of the Allies, which afforded to its side full information as to the tactical situation and, by driving the enemy's air forces out of the skies, made it impossible for him to keep track of what was occurring.

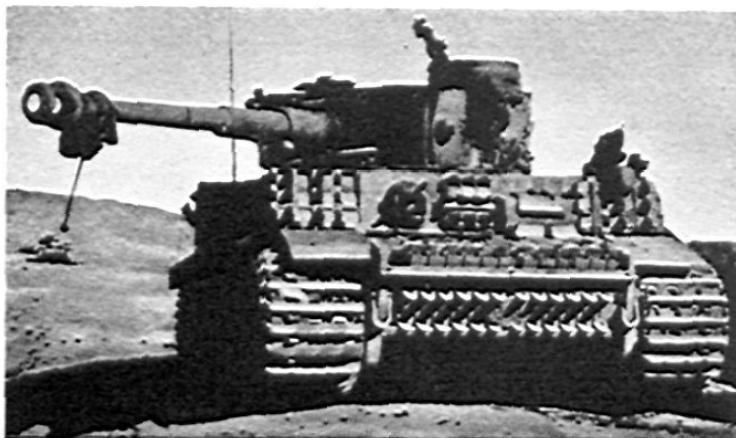
The Air Force also powerfully contributed to the Allied success by its continuous operations against enemy sea lines of supply, which included attacks on ships and on ports. To combat this campaign the Axis had started using motor barges and large launches.

Armored troops are vulnerable to artillery fire. To avoid excessive losses from this cause there is an increasing tendency to make major attacks at night. Their advance in day can be screened toward the front by smoke laid by the artillery, or if necessary by the air service, provided the wind is not too strong or in the wrong direction. It is not so easy to establish a smoke screen to protect the flanks of a rapidly moving advance. The British solution of using infantry divisions on the flanks of armored attacks, to cover the assault through the enemy's main line of resistance in order to protect the armored forces from antitank fire from the flanks, is excellent. Had the enemy a second line in reserve, however, this method would provide only for a piercing of the first line.

All recent campaigns indicate that if armored troops are employed, it is urgently necessary to provide a second (or reserve) line in rear of the front. It must be beyond range of the enemy's artillery, and sufficiently far back to avoid being involved in any defeat of the forward troops. It needs its own information service, and must be prepared to operate in any direction, in any weather, and at any hour. Its primary mission must be to encircle any enemy troops breaking through. Perhaps this is the most important lesson to be drawn from the Tunisian campaign.

# CLOSE SUPPORT in TUNISIA

By Lt. Col. P. W. Thompson, FA



*Germany's Pz. Kw. VI, called the "Tiger" by the British, is armed with an 88-mm gun and two 7.92-mm machine guns. This one follows the common practice of carrying spare tracks across its front, for additional protection.*

## EMPLOYMENT ON THE OFFENSIVE

The Battle of Long Stop Hill, 24-25 December, 1942, clearly demonstrated the well known principle that close support artillery must organize defensive fires in front of a position just captured to cover the reorganization of the infantry on the position and to support it against counterattack. General support artillery should be assigned missions of interdiction and harassing fires on suspected enemy installations and assembly areas in order to prevent or break up counterattack.

## EMPLOYMENT ON THE DEFENSIVE

### *Battery Positions*

Due to the wide front defended by the supported infantry, battery positions extended over a front of about 4,000 yards. If the terrain permits, batteries should be emplaced in depth. Best formation would be two batteries well forward with one 3,000 to 4,000 yards to the rear. However, with all infantry battalions of the Combat Team on the MLR, this is not possible and still give close support to all infantry battalions.

The great dispersion of the infantry in depth on the MLR forced selection of main battle positions back from 4,000 to 7,000 yards from the outpost line. This, combined with a "No Man's Land" of 3,000 to 5,000 yards, placed the bulk of the enemy's artillery and main forces beyond the range of supporting artillery. This lack of range was overcome by a modified use of the old "roving gun" idea. One section (or in most cases, two sections) of each battery were employed in positions well forward within the MLR, or even beyond it but in rear of the outpost, in order to reach out into enemy territory. By means of these forward positions it was possible to interdict enemy movement, and keep his installations farther back by harassing and neutralizing fires.

Within the battery positions, defilade, camouflage, and dispersion were stressed as passive measures of protection. Battery commanders were held responsible for close defense of their guns; full advantage must be taken, however, of protection offered by the infantry. Guns in the forward positions were in some cases brought back to the main positions at dark and returned to the forward position just before dawn, unless the infantry were able to supply the

additional protection considered necessary. With adequate protection, forward position guns were kept in the forward position during the night and used for night firing. The main battle positions were not fired from except to repel enemy attacks.

All batteries in the main battle positions were assigned alternate positions. Locations of forward gun positions were changed frequently. Dummy positions were not considered necessary unless the battery lacked flash defilade. The 105-mm howitzer is practically flashless. This is of great importance and allows the howitzer to be used in many positions that would be impractical for guns giving a flash. The successful use of the dummy position by a 155-mm gun battery was notable. The battery first occupied a position which did not afford flash defilade, and was promptly discovered by the enemy. Position was then taken in a ravine about 600 yards to the right rear of the old position. The new position afforded flash defilade. Dummy wooden guns were constructed on the old position, and camouflaged. Flash powder was exploded at the dummy position for each round fired by the battery. Enemy counterbattery continued to fire on the dummy position until the flash powder was expended. After that the new position was located by the enemy and the battery forced to move out of range.

Close defense of battery positions must receive careful consideration by all commanders since, due to the wide dispersion of the infantry (of which there never seemed to be enough), batteries are often open to raids or even the action of small patrols of the enemy infiltrating through the position. The .50-cal. machine guns must be emplaced for AA protection during the day and for close defense against ground troops at night. It is exceptional where the same machine gun sites can be used effectively for both. For AA defense these guns should be emplaced at considerable distance from the battery position, so that their AA fire will not attract the attention of enemy aviation to the battery position. For close protection at night, they must be brought in closer and sited for grazing fires across possible lines of entry into the position. Sentry posts must be dug in and manned by a picket of at least three men. They should have separate fox holes or slit trenches

within supporting distance. These sentry posts should be supported by the .50-cal. machine guns. Avenues of approach should be mined and/or wired, if these materials are available. Mine fields must be wired in and marked. Sentries must be instructed to fight in place if the position is attacked.

Slit trenches must be dug deep, and undercut to give protection against air burst.

#### *Observation and Intelligence*

In any defensive position, a system of OPs in depth must be organized and tied in by survey. All instrument readings must be from a known reference point. A reference point is preferable to a Y-azimuth reading. Observations are reported immediately to the FDC, and recorded by a clerk working under S-2's supervision. Whether fire is delivered or not is a command decision made by the battalion commander or based on his policy and that of higher authority, with due regard to the resupply of ammunition. A log of observations made at all OPs should be typed daily and forwarded for the information of higher commanders and intelligence officers. It was found that all observers (whether enlisted men or commissioned officers) required considerable training in reporting accurately what they saw and not what they assumed or deduced from their observations. OPs must be manned 24 hours a day. OPs can expect to be fired on, if disclosed by sky-line walkers. OPs must be dug in, and if placed on a forward slope connected to the reverse slope by a communications trench.

#### *Fires*

Fires fall naturally into three classifications: (1) long range (harassing, interdiction, and counterbattery fires); (2) emergency fires (normal and contingent barrages); (3) fires within the position. The first group of fires develops a great number of concentrations in the enemy's territory, and are an index to his activity and probable lines of approach. The second fires must be constantly kept up-to-date to agree with the infantry strongpoints and outposts and the most probable avenues of enemy approach. The third class of fires are prepared to aid in placing rapid fire on an enemy penetrating the position and to support counterattack. These prepared fires within the position act in the nature of reference points, as it is expected that observation will be available from OPs in depth and that such fires will be observed fires, or called for by the infantry.

Night fires must be coordinated with patrols sent out by the infantry. Liaison officers send in to the FDC overlays showing the patrols of their respective battalions for the night. A master overlay is made by FDC showing the route of these patrols, time of starting, and probable return, together with concentrations to be fired, showing time of firing and number of rounds. This master overlay is submitted to the Combat Team Headquarters for verification and check, and gives the Combat Team Commander a complete picture of the night's activities.

Support can be given patrols only if an artillery officer accompanies the patrol with a sure means of radio communication. The artillery officer must confer with the battalion communications officer and S-3 before going on such patrol, for a complete understanding on communications and expected fires.

#### *Ammunition*

To avoid jams at night which might put a gun out of action at a critical time, ammunition for night firing had to be especially

selected. No duds were reported, and only three misfires were reported over a period of four weeks.

#### *FDC Installation*

Issued light-proof tents are a satisfactory covering for the FDC, but hard to camouflage. The base of the tent should be dug in and the tent pitched low. A net is necessary to break up the outline and shadow of the tent. Farm buildings should not be used for an FDC. Gasoline lanterns give a satisfactory light for FDC, but are hard to maintain, as parts are quickly expended. Candles can be used in emergency.

Operation of FDC is necessary 24 hours a day. This type of work is a great strain on officers, if the battalion is in position for any length of time. At least three officers should be available for giving relief on the S-3 job (Executive, S-3, and Assistant S-3 can handle the job). All staff members and battery commanders must be thoroughly cognizant of actions to be taken in the event of attack or attempt by the enemy to infiltrate into position.

FDC installations should be separated from the remainder of the CP group. Due to the many verbal commands in connection with firing, any other installation near the FDC will lead to confusion and delay in fire commands.

#### *Camouflage*

Camouflage is all-important. In addition to the passive means of defense already mentioned, the use of natural and artificial camouflage of positions must be stressed. This is especially true when a position is occupied for any length of time. Troops are prone to gather natural camouflage too near their position. Also, constant pressure must be maintained on troops to prevent their becoming lax in the maintenance of camouflage.

#### *Survey*

When operating in areas where the only maps available are to a 1/50,000 scale or smaller, this map can be used as a firing chart. However, the above-mentioned firing chart should be augmented by a carefully prepared 1/25,000 or 1/20,000 grid sheet firing chart for close-in supporting fires.

Normal survey methods will apply on a 1/50,000 scale map. However, the accuracy of unobserved fires will necessarily decrease, and surveillance of these fires is desirable.

Horizontal control on the 1/50,000 scale map is much more accurate than the vertical control.

#### *Feeding*

Best system found was to feed by section. Food can be prepared for a battery at its rear echelon and brought to each section. Men must not be allowed to congregate at any time, especially at meal times—air attacks are most frequent at meal time.

#### *Cleanliness*

Special measures must be taken to permit men to bathe and keep themselves clean. A bathing place and a place to wash clothes should be selected by each battery commander, well away from the battery position. Battery commanders should provide hot water for shaving and washing at certain times each day. Officers must set the example in personal police and insist on the maximum cleanliness consistent with the situation, else morale will suffer and a general laxness develop.



## COMMUNICATIONS

*General*

Communications have been characterized by extremes in simplicity and complexity, and by special nets necessitated by rapid changes from general support under British control to close support of American infantry under varying degrees of British artillery control. Our wire, and to a lesser extent our radio, materiel proved flexible enough to meet these situations, except for minor difficulties in radio communication with British units.

*Radio*

At the start of the campaign, in a fast moving situation, the 610's and 608's were found adequate to provide initial communication before wire was laid, and for alternate communication when wire lines were out. In general, throughout the initial phase radio was used with liaison and forward observer parties. Inasmuch as the attack did not progress very far forward, the bulk of the 610's did not prove a serious handicap to the forward observers.

In the second phase of the operation, in which the battalion was in general support of an extremely wide sector organized for defense, communication was entirely by radio. Batteries had to be from three to ten miles from the battalion, so they were decentralized to a large degree. Communication with the British sector headquarters was maintained by the 284 radio.

The third phase was the organization of a defensive position in close support of various British and American units on a wide (12 to 14 miles) front with varying amounts of other British and American artillery under our control, cooperating with and controlling us.

Although the position was very stable, the organization was in a continual state of flux. Roving guns were constantly in position and changing position; supported infantry was changed; reinforcing artillery units were in and out of our control; and we were under the control of different British artillery units from time to time.

Initially, the radio proved very satisfactory, providing communication with our farthest forward observers and liaison officers until wire could be installed. A 24-hour watch was maintained at the battalion by a 608 radio on the battalion channel. We ruined one storage battery because we ran the motor only every two hours. Even though the voltage was never allowed to drop below the prescribed minimum, the battery plates suddenly buckled after about 72 hours' service, no doubt from the constant drain and recharging cycle. After that it was found satisfactory to run the motor continuously, allowing it to cool for about a half hour every two hours. Another trouble with our 608's developed: the dynamotors would get dirty and function improperly. Another weak spot was found to be the dynamotor relay condenser, which burned out on two or three radios. A certain amount of radio parts should be provided the battalion radio electrician to take care of such emergencies. Repair by higher echelons was non-existent in this campaign, and much too slow in others.

Before wire could be laid, contact with higher British units was maintained by radio. The British use voice practically exclusively on these nets. Except for the phonetic alphabet, which seemed to change with each British unit, our operators had no difficulty in operating in the British radio nets.

One major difficulty was encountered in our supply of dry batteries. We kept the use of the 610 to a minimum, so that our supply was merely getting low; but the 284 was used to a much greater extent. We had barely enough BA-43's to last for the operation to start with. Since the British-made batteries lasted only 6 hours as compared with the 24 hours American batteries were good for, we quickly ran out of BA-43's. We improvised BA-2's to fill the gap until we could scrape up a few more batteries from other units who were not using their radios.

We simplified the 600-radio net by putting them all on the battalion frequency initially. In case the wire went out, the radio would set up on this frequency and operate on it until the wire was in, or another station reported in. Then normal nets could be used by merely directing the station to change frequency. This expedient might be useful in other situations, but it certainly cannot be used in fast moving operations.

Interference by enemy and strong neutral stations was experienced occasionally on the 284 radio set. The British then switched to an alternate frequency which was invariably out of our range. However, our FM radios were not interfered with at all. We did pick up some German tank stations on our radios at one time, but the signal was weak and was cut off completely while our sets were operating. We tried to get some information from these German stations, but we didn't learn anything of importance except that German armored units were within radio range.

*Wire*

Wire in the first place was fairly normal. Initially a line was laid to each of two batteries and a lateral laid to the third. We did this because two firing batteries were close together, some distance from the CP. However, we very shortly laid another line to the third battery.

The second phase had no wire, but the third had more than enough to compensate for it. We used two BD-72's in parallel. From 17 to 24 drops were always in use, in addition to simplex lines to save wire. The battalion laid about 75 miles of wire (110 and 130). In addition, some British units laid to us. We were continually improvising new nets to save wire. We had to use party phones for some OPs and roving guns, and simplex lines to British units who used ground return anyway. To take care of extra traffic, a double trunk line was laid to one firing battery which had two roving guns and a forward OP into its switchboard.

Due to the fact that from one to six fire missions could be fired at once, there were a large number of locals at the FDC. Each computer had a simplex phone to his guns and a metallic line—in one case simplex—to his roving guns. Two locals were laid to the FDC tent; the computer's metallic phones were also used as FDC phones when the other two were busy.

Officers and men were inclined to disregard telephone secrecy at first, but inasmuch as the British used ground return, and long lines could be tapped, secrecy had to be stressed.

One of the first things a German patrol did was to cut out all wire lines. Two linemen had a narrow escape one night trying to fix the break: they were caught between both fires. When lines go out in the forward areas at night, radio contact should be established and the situation ascertained before sending linemen out far forward.

# IN TUNISIA'S MUD AND BLOOD

By Maj. Gen. Lunsford Errett Oliver\*



Arrows indicate German mechanized forces; points marked by letters are the successive positions of the Allied units as given in the text.

A forced march brought my entire command together on the morning of November 30th in the general vicinity of Medjez El Bab.

On the morning of the 29th I reported to the commander of the British division to whom I was to be attached for future operations. He told me things were proceeding very well and that he hoped to take Tunis and Bizerte.

Later in the day he said that things were not going as well as they might. The Germans had command of the air, while Allied Air, operating some fifty miles back from temporary fields, had difficulty bringing in replacements. The Germans could fly their planes into Tunis and Bizerte from their bases in Sicily.

Allied Air, on the other hand, had to fly theirs in from carriers or bring them to Africa in cargo ships and assemble them there. The Germans operated Stukas, Ju-88's, Messerschmitts, and a few Focke-Wulfs. They would strafe our troops along the roads all day. Our Spitfires would be up for maybe 10 to 15 minutes, whereupon Germans would immediately disappear, to return at once when our planes came down.

The material damage inflicted by the enemy air force wasn't great, but it was tough on morale. One of my units got strafed as many as 22 times in one day.

At the time the Division Commander had sent a brigade to advance via Medjez El Bab and Djedeida. Another column was operating farther north in the vicinity of Mateur.

\*Writing in *Collier's*, with whose permission we republish.

Since the Germans airpower was the chief factor holding up our advance, at the suggestion of a Senior Commander we planned an operation in which my command would, on the night of December 1st, advance in three columns to take the airfields in the vicinity of Tunis. The operation was somewhat hazardous, but we felt that it had a good gambler's chance of success and it seemed like the thing to do.

I was explaining this plan to Gen. Anderson, commanding the British First Army, at about noon on December 1st, when news was received that a large number of German tanks from the direction of Mateur were debouching from the hills via the road marked A on the map and moving to attack the Allied positions at Tebourba and Djedeida. Gen. Anderson at once called off our plan.

I was directed to send one of my infantry battalions to protect the road to Tebourba, and they took up an impregnable position (marked B on map) overlooking the plain where German tanks were moving about. The German tanks did not at once attack the British positions, and the next morning one company of my medium-tank battalion went out to attack the Germans, and the boys stuck their necks into a noose. The German tanks decoyed our machines into a screen of German 88-mm antitank guns, and while we knocked out some of their tanks, we got much the worst of it as we lost 9 General Grants.

The next day we were directed to chase some German parachutists out of the hills directly southwest of Tebourba. Snipers were interfering with communications along the road supplying the Allied forces. The company we sent forward was partly successful. On the following day we sent forward another, and together the two companies cleaned up the situation. On December 4th the rest of the battalion were sent up in reinforcement to occupy the entire hill mass overlooking Tebourba.

On the 3d, however, the Germans had attacked and overrun a brigade at Tebourba. My medium-tank battalion and a light-tank battalion had withdrawn to Medjez El Bab for badly needed repairs. The Germans overwhelmed this sector with tanks and airpower. Quite a few of the brigade of defending troops were crushed in their shallow slit-trenches by the German tanks. The brigade withdrew into the gorge between our two infantry battalions. For the next week or so, our armor took the brunt of the fighting.

At 0900 on the 6th, the Germans attacked the hill mass south of Tebourba with 3 battalions of infantry and 50 tanks.

We lost an excellent opportunity on this day to strike a severe blow at the enemy because our tanks were held up at least two hours in moving into position where they could have taken the Germans on their flanks as the enemy moved forward to the attack.

The German infantry attack was repulsed by our own men with severe losses. This I know from reports of our own men, and from accounts of enemy prisoners. The enemy tanks, however, which skirted the southern edge of the aforementioned hill mass finally forced our infantry from their positions. They overran our artillery battery and the nearest infantry platoon on the southwestern part of the hill mass withdrew to avoid being cut off. Meantime our tanks, which were initially in the positions marked C and had finally moved forward, were stopped by the Germans antitank guns.

I obtained permission to bring my other infantry battalion from its position at B across the Medjerda River by fording, in order to counterattack and regain our position. This counterattack was made at about dark and the northwestern part of the hill mass was regained with little opposition.

We withdrew during the night to the hill mass marked E. My armored force was badly in need of some rest, and our equipment, after the long march and several days of action, was badly in need of repair and maintenance. Some additional infantry was expected soon.

It was planned to readjust the lines, involving local withdrawals, so that the infantry could hold them while the armored force went somewhat to the rear for rest and work on vehicles. It was feared that the withdrawal I wished to make would tip off the Germans as to this plan.

On the night of the 7th, when I had wanted to withdraw, it began raining. The rain continued for several days and the ground became very soft. Finally an order was issued for a withdrawal on the night of the 8th, but it was immediately canceled. Then on the 9th I was ordered to withdraw on the night of the 10th.

This order, I subsequently learned, was intercepted by the Germans, and on the morning of the 10th they attacked to cut off our route of retirement across the Medjerda. A column of their tanks came down the road from Tebourba and was taken under fire by twelve of our tanks, and the Germans withdrew. At the same time some of their infantry attacked one of our battalions with heavy losses to themselves.

They made a tank-attack threat against Medjez El Bab, which we countered with an attack with our light tanks, our light General Stuarts moving in against German M-4 and M-3 machines. During this action, one of our 75-mm antitank guns knocked out 5 of their tanks with 5 shots, and we lost several tanks which became bogged in the mud.

This indicates good shooting on our part, and while I believe our shooting was on the whole fairly good, it was still not so good as it might have been. This was due to a shortage of ammunition.

I believe it would be better to fire 4 shots in practice for every 1 fired in combat. That, I am afraid, wasn't the ratio we worked on. On the whole, our marksmanship was as good as the Germans'; but in warfare, to be just as good isn't enough—we have got to be considerably better in order to win. Moreover, the liberal use of ammunition in practice relieves a serious transportation problem. Obviously, if your

marksmanship is good you need not carry as much ammunition as you require when you must make allowance for an inordinately high percentage of misses.

On the evening of the 10th I was told at my command post near Medjez El Bab that I was wanted by the Divisional Commander.

I wanted him to send up a company along the concrete highway to hold a bridgehead to enable us to move the troops and equipment we had on the hill marked E, across the river and down the highway. My request was readily granted, but the night was pitch-black and I had to find the brigade commander, which took a little time in the darkness. I thought I'd go up and watch them come out; then decided not to go, for I would be bucking traffic all the way and would only add to the congestion. Later I had cause to wish I had gone up.

The local commander on the spot (an officer whom I had appointed to coordinate the movements in the area) decided that the forces should not come over the bridge and down the hard highway, but instead should move down along the earth road east of the river (shown on the map in broken line). There had been a few random shots from German tanks near the concrete bridge, and he assumed that the enemy was attacking in strength.

At 0130 that morning an aide handed me a radio from the local commander, stating that vehicles in the column moving southward along the rain-soaked road were bogging down and that he had ordered their abandonment and destruction. Immediately after that message was received, his radio did not reply; it presumably was knocked out. We lost a number of vehicles including half-tracks, self-propelled antitank guns, and 11 light tanks. I immediately relieved the local commander of his command. I never felt so badly in my life. The only comfort I could draw from this blunder was the fact that we still had our men, all of them having marched back safely.

I wish to make it clear that no fault attaches to our allies for what happened. What happened was our own fault. From what occurred, however, we can profit. In general, we failed to do what we had been taught to do. We proved ourselves inclined to be too impetuous. We tried to overrun the Germans instead of utilizing the proper combination of fire and movement and adequate reconnaissance.

I am thoroughly convinced no army can get anywhere without adequate air support. I am equally convinced that battles cannot be won with airpower alone. Air and ground troops must be thoroughly trained to act as units. The Germans, thus far, have worked air support for ground soldiers to a far better degree than we have. I don't see any reason why we shouldn't develop such co-ordination.

There are a few other general observations I would like to make. I believe the American people must be prepared spiritually to accept the inevitable high losses which will be entailed in the fighting henceforth. Up to the time I left the North African front, our losses totaled about 750 killed, wounded, and missing, and we had scarcely begun to fight.

I have no doubt as to the ability of the men to "take it," but our objective is to "hand it out." To hand it out, we must have the full support of the civilian home front.

I found the French to be good fighters but they desperately need equipment. They are very friendly and cordial to us and they fight very well. We should supply them with good modern equipment as rapidly as possible.

# British Artillery Action in Tunisia

By A British Artillery Officer

After Dunkirk many men without previous military experience were thrown onto the British beaches to man guns hastily installed there. In January, 1942 a regiment was raised from among them. During eighteen months these men had gradually changed from civilians to sunburned soldiers, but they had never served far from their relatively fixed beach positions. Never had they experienced maneuvers, or any of the work of the Field Army. Never had they soldiered in more than little isolated "packets."

So when they formed, it was a new conception of soldiering that was opened up for those who were physically fit enough to become Field Artillerymen. They worked unaccustomedly long hours, and trained with the understanding that they must be fit to fight before autumn. After six months they were pronounced fit for active service as a Field Artillery Regiment. A month later the present writer, who had the honor to raise and train them, was snatched away to the United States. Another two months, and they were in North Africa. And then—but let 1st Sgt. P. P. Warren tell of "R" Bty., ——— Field Regiment, R.A. (8 guns, all 25-pounders).

"R Bty. was away from the rest of the Regiment in support of a battalion of infantry (less 1 company). They were sited 'right on top' of 'Jerry'—and a constant source of annoyance to him. He could never eat, sleep, or work in peace. The main O.P. of the Battery covered a very wide arc—so the Battery could do almost what it liked with any Jerry who appeared within range.

"One fine morning we received the news at RHQ that tanks had attacked the position at first light. As the morning progressed this first attack developed into a full scale battle. The enemy had positioned mortars, small arms, and MGs at points covering the Bty positions. Self-propelled guns had taken up positions within range of the Bty, and tanks of several types (including the newest German model) were reported in several areas surrounding the Bty.

"Throughout the morning the Bty were subjected to MG, mortar, and shell fire together with frequent attacks from

fighter aircraft, etc. The first attack was made by tanks and was beaten off, about 3 tanks being knocked out. Great difficulty was experienced in trying to get ammunition up to the Bty for, later in the day, the supply route from the rear areas was cut.

"The afternoon brought renewed attacks on the Bty, and they grew in intensity. Numbers of casualties had by then been sustained by the Bty but they continued to fight the guns with exceptional determination. As the afternoon waned another attack developed with tanks taking a prominent part—probably about 30, including several in hull-down positions. "Tigers" led this attack, and their policy seemed to be to knock out each gun as it opened up on them. You know how formidable these tanks are and you will understand how easy it was for them to knock out the field guns one by one. Our guns had been cut off from the O.P. and no direct fire was possible. Even had it been possible, so many targets were being presented and so many calls for support coming from the Infantry that indirect would still have been impossible—the policy was 'our own infantry first.'

"To cut this long and sad story short—as dusk fell on the position the guns gradually went out of action. All fought to the last round and gun but the formidable Jerry tank guns and MGs slowly overpowered them. Many tanks were knocked out.

"Of the people on the position and at the Command Post, all of whom are missing, you will know the following . . . . I cannot, of course, relate *all* the O.R.s\* missing.

"As a result of this action and later actions involving the other Btys, the Regt has, I believe, the largest number of awards in this theatre—7 awarded, and possibly more to come."

Yes, this is what happens in the Field Artillery. "All fought to the last round and gun, . . . our own infantry first."

A Citizen Army—but one can hardly better the record for that true Gunner spirit which is common to both the U. S. and the U. K.

\*Other Ranks, meaning Enlisted Men.

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## WATCH YOUR "K"!

**Dispersion of any given lot of 105-mm powder is generally within the probable errors as given in the range tables. "K" does vary considerably, however, both among different powder lots and among the different zones of the same powder lot. For some time yet to come, a "K" of approximately plus 25 ft./sec. may be expected in the lower zones of this ammunition. This situation is being corrected, but this inherent variation must at present be watched for, expected, and corrected for as a matter of ordinary routine.**



# ENGINEER SURVEY

## with reference to Artillery

By Lt. Col. W. C. Hall, CE

With the experience of the Western front in the last war hanging on our military thought like a millstone, many special cases were applied to general fields in strategy and logistics. Since 1:20,000 maps had been available in northern France (and had been prepared subsequently for our scattered army posts), the belief became very prevalent that accurate maps at this scale would be available in future wars. Inasmuch as effective map firing is possible from 1:20,000 sheets, survey appeared unimportant.

Faced with the discovery, sometime in the awakening thirties, that 1:20,000 maps were in fact available for only two or three per cent of the earth's surface, the theory was evolved that "An army must be prepared to map as it moves. The Air Corps must be equipped and trained to take photographs, and the Engineers prepared to produce maps." The maps demanded were at 1:20,000 and contoured.

Tests soon indicated that the manpower necessary to pave an army's path with a reasonable large-scale facsimile of the terrain was enormous. Topographic brigades or divisions would have been required. And there were several "ifs." Without occupying the ground, the only feasible methods consisted of either locating known control points in enemy territory by identification on photographs, or of "cantilevering" or projecting control from our territory forward. In either case, this control was to be used with photographs in precise photogrammetric instruments. The photographs, in addition to containing legible detail of the terrain, had to give a complete, overlapping coverage of the area at a single consistent scale. Very little tip or tilt in the photographs was allowable. Photography was possible only on clear days. The possibility of enemy anti-aircraft or interceptor attack had to be considered. The possibility of mapping en route appeared hardly feasible after a few tests.

The mosaic or photomap was then proposed. These map substitutes required much less time to produce and the flying specifications were not so stringent. However, the location of points was not so precise, either in position or in elevation, and the location of check points by survey was necessary. The Air Corps and Engineers could produce a complete coverage of a theater at 1:20,000, but pure map firing was no longer efficient. Surveyed traverses linking friendly positions were required, and registration in the target area was considered essential for economical fire missions.

Then came the "blitz." Poland down in eighteen days, France defeated in forty. Instead of armies forging ponderously ahead three to five miles a day, panzer divisions struck out 25 and 30 miles. Dive bombers replaced artillery in supporting infantry and tanks, and for the moment it appeared that a good road

map was all that was required for military operations. A tank column could move across the width of a 1:20,000 map sheet in a matter of minutes, and a complete coverage of a week's operations at a large scale would fill the commander's tank. Some thought that the transit would follow the cavalry lance into museums and history books.

Odessa, Bataan, Sevastopol, Leningrad, Tobruk, and Stalingrad produced examples of operations which did not proceed at breakneck speed. The value of the very best large-scale maps in these vicinities was apparent. Concentrated artillery fires once again became the commander's right hand punch. At El Alamein we found the final illustration. Accurate survey data enabled batteries to move into position and open fire on vital targets without previous registration, a hub-to-hub show produced one of the heaviest concentrations of fire since the Meuse-Argonne, and Rommel was literally blasted out of Egypt. Each time the "Desert Fox" tried to make a stand, massed artillery fires are credited with vital roles in the ensuing attack. Historians of the future may point out Montgomery as the first leader to skillfully use massed artillery in this war.

### SURVEY RESPONSIBILITY

The methods the British employed are similar to our own. Our own doctrine and training in the employment of large concentrations of artillery are sound. Let us examine the survey aspects of this problem.

The chief engineer in the theater of operations is responsible for the collection and dissemination of geodetic control information to appropriate engineer and artillery units. He may call on his own or subordinate engineer staffs or topographic units to locate stations, evaluate and compute information obtained in the theater, or extend existing control.

The topographic units have a primary mission of securing adequate control for maps or photomaps. As far as is consistent with their mapping mission, engineer topographic units will assist artillery survey personnel.

Artillery survey units are concerned principally with the necessary location of batteries and targets to permit unobserved fires. Control information and engineer survey stations are used to produce a common grid system which facilitates the exchange of registration data from one battery to another and which permits the massing of fires.

In order for the engineers to carry out their responsibility to furnish maps and geodetic data to all ground force units, the Army Map Service, other government agencies, and capable contractors are using every available source for material and turning out maps of all possible theaters of operations. At

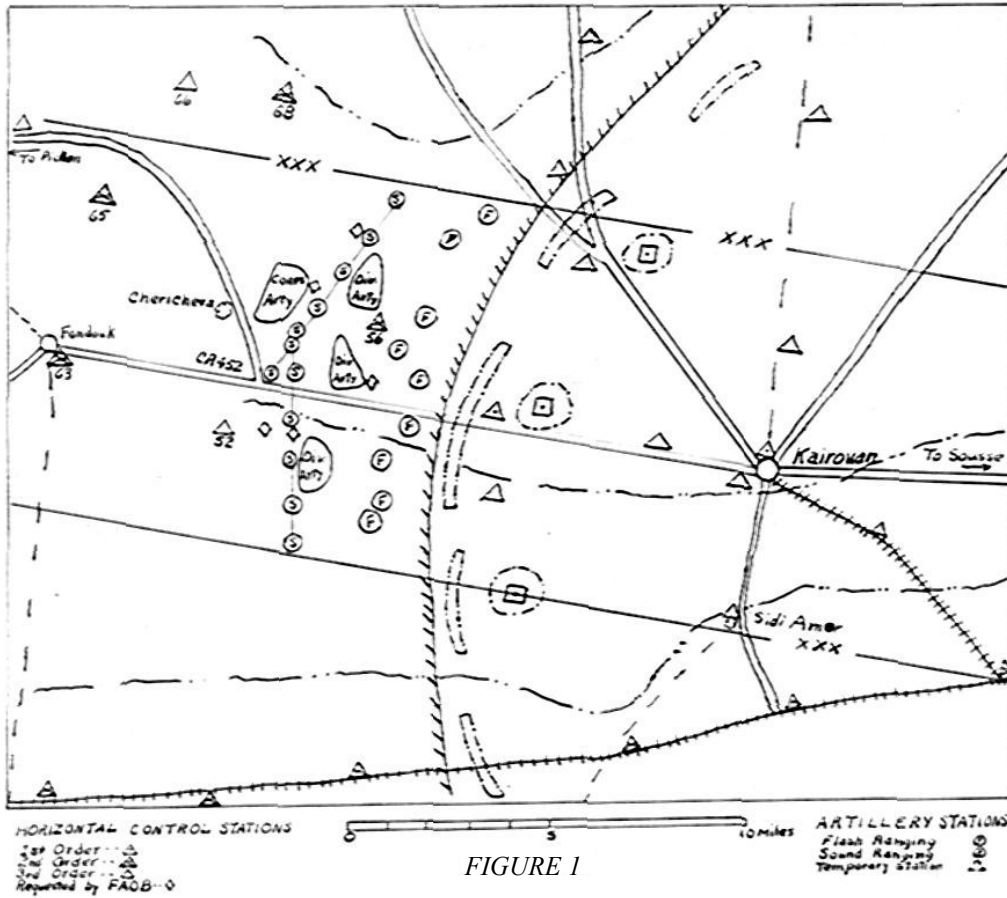


FIGURE 1

the same time, geodetic units are gathering together control information throughout the area of the world. This material is translated, evaluated, reduced to a common datum, and published in convenient booklets with control points plotted on map overlays.

In general, there is considerable geodetic control in possible major theaters. The density of control varies very nearly with the value of the land. Areas of any wealth and development have been surveyed, and those with control points more than 25 miles apart are unusual. Undeveloped areas such as New Guinea have little "trig data," but here we find combat in terms of battalions rather than divisions.

TOPOGRAPHIC UNITS

There are four types of topographic units: G.H.Q. battalions,\* Army battalions, corps companies, and aviation companies. The G.H.Q. battalion is equipped and trained to produce contoured maps meeting the highest military specifications. The other units are equipped to revise existing maps and charts, to produce photomaps in quantity, and to produce overlays and overprints. All these units have an adequate reproduction capacity to produce in quantity maps or photomaps and to reproduce existing map sheets.

The aviation topographic company uses astronomic methods to obtain control of sufficient accuracy for air force charting, but not for large-scale mapping or artillery survey use.

The base battalion includes twelve survey parties (probably to be reduced to nine) and the army battalion has six parties (probably to become four) capable of carrying control at third order or higher accuracy. Either triangulation or traverse may be employed. The corps company has two survey parties, similarly equipped but generally carrying control by traverse.

An engineer survey party usually consists of a staff sergeant chief of party, a sergeant instrument man (theodolite), a corporal instrument man (level), a T-5 and two private recorders, four rodmen, three tapemen, and an axman. The party is equipped with a one-second theodolite (or a substitute transit), a dumpy level, chaining equipment, plane tables, and some triangulation equipment.

Each survey party can put a triangulation or traverse party and a level or plane-table party in the field at the same time.

\*To be redesignated as Base Topographic Battalions.

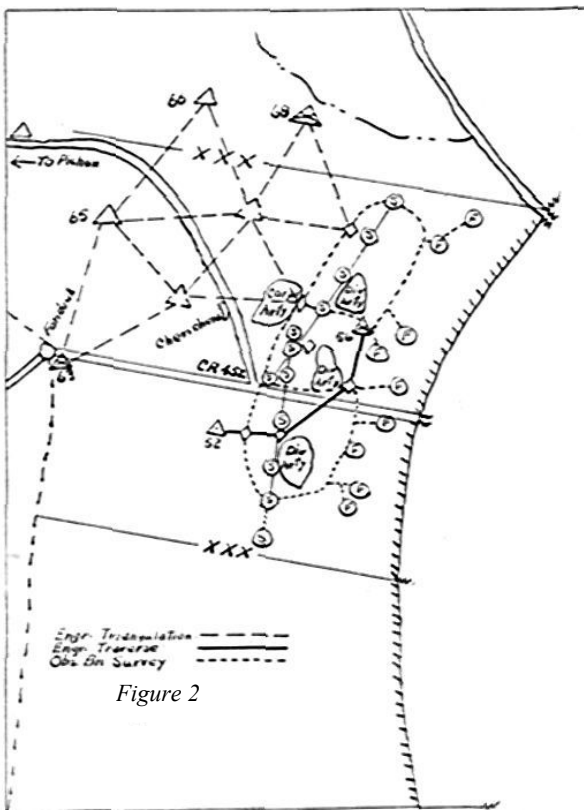


Figure 2

Triangulation, using temporary improvised targets, is favored for extending control. In traverse work, slope taping using chaining bucks is generally employed. Work is generally at third order accuracy. Traverses at 1:3,000 and flying levels will satisfy artillery requirements for short extensions of control.

#### SURVEY PROBLEM

The relative functions of engineer and artillery survey elements can best be shown by an illustrative problem. Tunisia may be taken as an example of a theater requiring strong artillery support for attacks. Examination of Tunisian control shows that, on the average, there is a horizontal control position for each six square miles of area. Adequate vertical control data are also available.

Control is fairly uniformly distributed at this density all through Tunisia from Bizerte to the Mareth line and west into the mountains, except for the salt lakes west of Gabes. The density of control thins out in this area and in the mountains of Algeria, and there is practically no control in the desolate Grand Erg Oriental to the south.

Let us assume that a type American corps is attacking a strong German position in north central Tunisia, near Kairouan, with a frontage of about ten miles. For the purposes of our problem let us assume that half the control positions are considered unreliable or cannot be recovered. Planned artillery installations and recoverable horizontal control points are shown in Figure 1. Many roads, terrain features, and military installations have been omitted for the sake of clarity.

The problem opens early in the morning. Three squads of an Army topographic battalion and the two squads of the corps topographic company are available to assist the field artillery observation battalion. Detachments of all three units have located the plotted control stations while the positions for

divisional and corps artillery and the observation battalion were being selected and leading elements of these organizations were moving into position.

The commanding officer of the observation battalion requests the location of four points—two in the north and three in the south portion of the artillery areas—within eight hours. The Army battalion agrees to provide the northern stations by triangulation from stations 63, 65, 66, and 68, and the corps company will furnish the information for the southern positions by a traverse loop from station 52 to 56.

The observation battalion starts three survey loops from CR 452 with an assumed position and azimuth. Sound and flash ranging stations are surveyed in by parties of the observation battalion and corps and division artillery survey sections tie the battalion orienting lines into this system.

By nightfall the military grid locations and the elevations of the four stations have been furnished to the artillery. In the meantime, the observation battalion's six parties have run about thirty miles of traverse and completed the planned survey loops and located the observation battalions installations.

The corps' arbitrary grid is converted to the local military grid. The location of the northern points by conversion is checked against the positions established by traverse. Figure 2 shows the complete survey picture.

The correction angle and coordinate values are furnished to corps and division artillery, and registration during the day permits massed fires supporting the attack during the next morning or to assist in breaking up hostile counterattacks during the night.

Blockade and air bombardment will not subdue Germany. The Festung Europa must be assaulted. And in the attack of carefully located and prepared Nazi defenses, massed artillery fires will be required.

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#### ARTILLERY IN AFRICA

"*Doughboy Observers* (page 277 of the April JOURNAL) provides a pointed commentary on our training. That FDC team may not be around the next time the 88s are sighted, but why shouldn't the doughboy be able to get the 105s on them? Infantry, TD, and Tank officers at the front realize the necessity of being able to conduct indirect fire and we are starting to cut the mystery out of it and teach forward observer methods, at least.

"The British method might be of interest. The doughboy identifies his position by coordinates and the target by a compass direction from him—'Reference position, German battery is northwest 700 yards.' If necessary, a smoke round is fired and adjustment then continued with HE by sensings similar to 'Reference burst, target is 50 yards southeast.' This method is SIMPLE and does not require knowledge of the line of fire. It presents no new problems to the HCO so long as his chart is oriented.

"American, British, and French officers are being brought back from the Tunisian front to a British 'battle school' to learn such things, but why should we wait until the fighting begins to learn the obvious?

"Incidentally, the British are using an excellent smoke shell with their 25-pounders. It has a time fuze, and three separate cannisters are ejected in the air burst; these scatter and thus prevent the pillaring we often get from ours. We hear of a base ejection smoke shell (M84) for our 105s on these same lines, but have not seen them in North Africa.

"Here's a plug for the Communications Dept. at Sill: Gen. Montgomery allows only officers to send messages over the radio. Technique must be letter perfect, and an officer violates the procedure only once."



When "combat loaded," the M-7 has no room for unnecessary equipment. The same is true of all other transport—ammunition is more important than personal frills.

## THE SIMPLE LIFE

By Capt. E. A. Raymond, FA

Pre-embarkation tension needs an outlet somehow, and while officers and men are confined to camps or staging areas a good deal of energy is usually expended in amassing a kit. Poop-sheets are produced of a flamboyance which would turn Grover Whalen green with envy. The prescribed equipment this writer was supposed to bring away to Africa exceeded the official weight limit by 50 pounds (this has certainly been remedied since). As in one or two other little matters which he has regretted afterward, he put one over on the Army that time: he got to Africa with 75 pounds of excess weight. It did not pay. Only bedding roll and musette bag are left, and insurance on that bedding roll would command a nice, fat premium. Two barracks bags (one for blankets and tent, the other for everything else) is a much more usual arrangement.

There is just no room for bulky personal equipment in an artillery column; there would not be, even if every authorized vehicle were in it—which is never true. The best troops travel the lightest, and any space that can be scraped out goes for ammunition, occasionally fuel, sometimes for camouflage fixings, and often for food. Personal equipment becomes a terrible nuisance, and whatever is not immediately essential goes out.

The early troops over who took foot lockers, and all who took val-a-paks, may not have lost their baggage permanently. It is stored at a base somewhere. But leave to go and hunt the stuff is improbable, and the chances of the goods following a unit automatically, at least during a campaign, are not worth discussing. It would be much better if the equipment were home where, if an item were really needed, it could be sent on by family or friends.

Of course there are a lot of different cuts in a side of beef. The number of men in the lines is never equal to the number in the services and in overhead in the rear. Even artillery officers are sometimes put on odd jobs or staff jobs. If you are sure that at least initially you are going to duty at a base, a val-a-pak is worthwhile in order to stay smartly tailored. Some gentry even have their full impedimenta intact. But the author has seen perhaps a hundred combat artillery officers with about the

same personal outfit. They decided that they wanted a winter, not a summer, kit; they did not try to take both along. North Africa has been cold, wet, and muddy. The only summer items being lugged around are the necessary trimming to turn issue cottons into officers' cottons: monkey caps (or possibly just braid) and shoulder straps for shirts. Officers in the summer should reverse the procedure.

Here is what a battery officer in Tunis probably has left of all the stuff he brought away from the United States.

- I. He probably stands in:
  - Woolen underwear and socks.
  - Dogtags on cellulose cord.
  - Combat suit (often replaces all woolen uniforms).
  - Tank boots—anyone who can get a pair of British battle-dress boots is lucky.
  - Whistle.
  - Watch.
  - Steel helmet (liner and beanie).
  - Goggles.
  - Carbine. Pistol not highly regarded, and Tommy gun lacks range. Do not wait until you come abroad before fixing up a leather boot for your vehicle.
  - Belt, with shoulder straps, ammunition, compass, aid kit, and canteen set.
  - Field glasses. An artilleryman considers these his most valuable worldly possession. Extra quality is worth any amount of money. Dollars and cents do not seem very important while fighting; fire control equipment does.
  - Dispatch case, with maps, firing tables, notebooks (hard to get here), pen, pencils, *Field Artillery Guide* (do not let anyone borrow it), V-mail blanks, picture of the little woman, and the letters you are going to answer soon. Also a pocket dictionary in the appropriate languages; none on sale locally.
  - Musette bag, with towel in which are wrapped a few toilet articles; do not worry about reserve supplies: everything you really need comes with the ration or can be "scrounged" somehow. The same goes for smokes and candy. Matches, however, are uncertain; a coarse lighter that can burn red gas is a smoker's essential. Sewing set. Cleaning cloth. Saddle soap. String, patches, and oil. Wad. Flashlight (forget about spares). Can



opener and food; you lay a couple of tins of stew and your canteen with coffee powder in it between the exhaust manifold and the cylinder block of your jeep, and as you drive through the cold, black, rainy night you contemplate them, gently.

II. In Bedroll (in case of substitution of two barracks bags for the bedroll, an I.C.'d shelter half should be obtained as a ground sheet):

Shelter tent.

Sleeping bag. Worth all the money that can be spent on one. Never mind the rubber air mattress.

Extra woolen underwear and socks. Home-knits are grand.

Muffler and gloves.

Sheepskin shoe-packs and rubber lace boots—the only way to keep feet really comfortable.

Extra boots or shoes (G.I.).

Perhaps one woolen shirt and pair of trousers.

Bath towel.

Twelve handkerchiefs—hard to wash and harder to replace.

Raincoat and shortcoat. No long coats are good in mud. Trench coats, furthermore, do not keep a man warm in cold weather or dry in continued downpour; gabardine types show mud stains badly. Our best grades of shortcoat are warm in any weather. Alligator coats are good raincoats, but the ideal is the British gas cape, in camouflage colors and with a grotesque-looking bulge for the pack in back. These are worth many blandishments and some skullduggery.

Such is the list. Cutting a pretty picture on leave is a problem which will have to be considered later, if at all.

In case the inventory is faulty, deficiencies can be made up by barter. A stock of hot patches for vulcanizing tires is recommended as trade goods, if not for personal use. Steel splinters (not only from shells but from tank treads as well) lie on all the roads around here and make life miserable for us tourists. A hot patch will get you one iron cross, two fresh eggs, a bottle of French wine, or a map.

City cousins in rear areas should bring cleaning fluid with them. In officers' stores they can get PX stores—less fancy items like insignia—and enlisted men's equipment, together with some British goods of excellent quality. It has been true in North Africa, and presumably will be true on the continent, that QM laundries, post exchanges, and the like follow the Army rather slowly, and improvisation must be made for weeks and months in the meantime. The American Red Cross fills the U.S.O. bill as adequately as circumstances allow.

The thing to be borne in mind upon coming abroad, however, is that war-zone soldiering is not like soldiering in America; you need remarkably few comforts. Recreation is another word for sleep. Whether you like it or whether you do not, you must live the simple life—and the simpler the better.

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#### TUNISIAN LETTER

"I have only praise for our new radios; they are the answer, or shall we say the beginning of the answer, to the artillerymen's prayer and fondest hopes. What the artillery has been able to accomplish (and believe me it's been plenty) has been made possible by a reliable means of radio communication. This reliable means of communication makes us feel invincible; the problem now is observers.

"We can handle any situation if we have an observer in the area. In our last battle we had three forward observers (one each battery); three liaison officers observing from infantry battalion OPs; three battery commanders observing, supplementing the forward observers; one battalion OP which was increased to two before the battle was over. That makes 11 observers, and in a pinch I use my Asst CommO as an emergency observer. Sometimes I do some observing too; so nearly half of my T/O strength in officers is used as observers. Our air OPs are coming now, and I think we will find good use for them. Heretofore we have had such excellent ground observation air OPs seemed unnecessary, but when we work our way forward onto the flat plain country they will be needed also.

"While on this front we fired some 15,000 rds., averaging about 300 rds. per day. Most of this was fired from our roving or forward gun positions. We used our main or battle positions only in case of an attack: Jerry was using sound ranging and we didn't want to disclose our battle positions prematurely because new ones were too hard to find. We obtained three extra howitzers from the Ordnance; this allowed each battery to maintain a platoon in the forward or roving gun position. We had a 15-gun battalion until about two weeks ago, when Corps took them away to help re-equip a unit that had lost theirs.

"Our CT had a front of 12-14 miles in circumference. We were not the only artillery in the sector—generally we had either a French battalion of 75s on our north flank, one or two British batteries that could help us on our south flank, with a troop to a battery of British mediums in the center. Actually we fired all batteries anywhere in the sector, almost a 3200~~ft~~ front. You will wonder why, with the help mentioned above, I didn't confine my battalion to a narrower front and let the others share some of the responsibility. The answer is you never could tell from one day to the next what you had. Units were moved in and out every night, which required a complete reorganization of the artillery plan every morning. I could only discharge my responsibility for support of the CT by covering the entire front regardless of what else was present."

# Hints to a Battery Commander Going Overseas

By Capt. Misha N. Kadick, FA



*The ubiquitous jeep fills every need. At the Lunga River swimming hole it serves as taxi, dressing room and beach.*

When an organization is about to embark there is always speculation of what to take and what not to take in the way of organizational and personal equipment. Naturally, TBA organizational and personal equipment is taken, but there are so many small odds and ends that can add a great deal to the comfort and convenience of the men. Some of these items are virtual necessities, and no one can foresee all these things without actually going through the experience.

The items listed have particular reference to the tropics, but it is hoped that they may start a trend of thought leading to ideas appropriate to cooler climates. This list is generally applicable to any theater of war.

One thing must be borne in mind. Troops are not continually fighting once they arrive overseas. There is often the impression that there will be no time for recreation upon arriving at destination. There is *always* a need for recreation, and there will be rest periods and days of comparative quiet while the "big picture" is being formulated.

Important items that should be taken if at all possible include:

*Shower Heads.* These are highly important in the tropics. Showers can be devised from barrels, but shower heads or any form of valve is scarce and a few of these tucked away in a box will prove themselves very useful.

*Movie Projector.* If at all possible an organization should purchase a movie projector. (This is more applicable to a battalion rather than a battery.) It could be carried as hand baggage by an officer.

*Generator.* It should be TBA for every unit to have a generator. Since it is not, then every effort should be made to take a small one along; necessary wire and sockets must not be forgotten.

*Organizational Camera and Developing Set.* Taking pictures is not permitted in most theaters, but official unit photographers may be appointed, although developing facilities are not normally available. Ample film should be taken, as well as some developing and printing supplies.

*Radios.* A radio is the only link a soldier has with the United States. Nothing is more true than the statement that away from home the American soldier is the most homesick soldier in the world, and it's amazing what a thrill it is to hear voice and music from home. Regular table model radios with short wave band have been found to be the most satisfactory. A power pack can be built in case there is no other power source. Popular all-wave portable models have been found to be too fragile, as a rule.

*Athletic Equipment.* Soft ball and volley ball equipment is not bulky and should be classed as a necessity.

*Cards, Checkers, etc.* If games such as these are not taken by the organization, individuals should be encouraged to purchase some and take them along.

*Screen Wire.* This is very scarce and very necessary in the tropics.

*Insecticide and Rat Poison.* Too much of these cannot be taken. If it is a matter of doubt whether any at all can be taken, then at least some of the latter should. This is a matter for both the organization and the individual.

*Pipes.* Many former non-smokers start smoking a pipe when they become campers. Good pipes are difficult to get when you are away from home. If not used for smoking, they make excellent items for barter.

*Cigarette Lighters.* Matches are frequently unobtainable. A good lighter with necessary spare parts would be well worth the while of every individual.

*Hunting Knife.* Every one should be equipped with a good knife; they are extremely useful.

*Magazine Subscriptions.* As many magazines as possible should be subscribed for by the organization.

The items that have been listed are those that have been found most useful and the most difficult to obtain. Some can be obtained by a good Supply Sergeant, some purchased from the Battery Fund, and others purchased by the individual. They will more than pay their way.

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FROM "WAY "DOWN UNDER"

"Thank you for your kindness and promptness in shipping previous [book] orders. Your service is a godsend to us out here."—LT. COL., FA

# THE TANK

"Basic means of disabling tanks and of repelling tank attacks is artillery fire at pointblank range. Antitank guns are the chief weapon for antitank defense."

—Red Army's Field Regulations

## and its Adversary By Capt. Robert D. Hanson, Inf.

The concept of a mobile fortress is not new. The ancient chariot of the Persians, the elephants of the Carthaginians, and the armored knights of the Middle Ages were but the forerunners of the modern tank.

Each held undisputed mastery of the battlefield until a stronger defense was created to oppose the new mobile fortress. The horsemen and phalanx of Alexander the Great withstood the onrush of the chariots, destroyed them and the Persian Army.

The Roman Legions, which had fled before the onrushing Carthaginian elephants during the First Punic War (264-241 B.C.) had soon discovered means to destroy the elephants and Hannibal at the Battle of Zama in 202 B.C.

The English long bowmen during the Hundred Year War drove their arrows with sufficient velocity to penetrate the armor of the French knights. The invention of gun powder and its use brought the final end to the knight in armor.

The Hussite Wagon Fortresses of the fifteenth century and similar less known innovations held sway for a short period of time, then went down before a more modern defense.

### HISTORY OF TANKS

The idea of the tank did not spring up over night in the last few decades. The armored train was used in the Boer War with considerable success. Within three weeks after the beginning of World War I, the armored car was being used by the Belgians against the German invader.

Major-General Swinton in 1914, using the then concept of a tractor, began to develop the modern tank. It is interesting to note that the chief promoter of the original tanks was named Winston Churchill, then First Lord of the Admiralty. On September 15, 1916, the new armored monster was put into action at Flers, France, during the great Battle of the Somme. Forty - nine Mark I mechanized vehicles were thrown into action with tremendous success in spite of mechanical troubles. The British on that day threw away their great chance by prematurely using their new "secret weapon"; however,

the great victory of August 8, 1918, "the Black Day of the German Army," was largely due to 450 fighting tanks.

Soon the Germans and the Allies were developing very successful means, especially artillery, to combat this new, terrifying weapon. About 88% of all Allied tank losses during the First World War were inflicted by artillery fire. As a result of experiences in that war, many of the democratic powers became convinced that the tank was simply a good close supporting weapon for infantry. This failure to emphasize the importance of tanks and of antitank weapons produced tragic results in the first years of World War II.

Led by General Eimannsberger and Guderian, the German Army began to develop a new theory for the use of mechanized forces. "The attack by tanks," wrote Guderian in 1936, "must be conducted with maximum acceleration in order to exploit the advantage of surprise, to penetrate deep into enemy lines, to prevent reserves from intervening and to extend the tactical success into a strategical victory. Speed, therefore, is what is to be exacted above anything else from the armored weapon." The standard German Army Regulation stated the new law thus: "In the zone of action of the tanks, the action of other arms is to be based on that of the tanks."

In the Spanish Civil War, as Major F. O. Miksche points out in his recently published *Attack*, the Germans and (fortunately for us) the Russians learned many new lessons concerning tanks and what weapons are necessary to stop them. But apparently the only important article on the subject of antitank guns in the French military press

indicated that the 20-mm Oerlikon antitank gun, a notoriously inadequate gun, was sufficient. Only a few isolated leaders in democratic nations such as French General De Gaulle and British Generals Wavell and Fuller saw the mechanized vehicle in its proper light.

Let us now look at the tank itself. A tank has many advantages, which



*Pz. Kw. III chassis has (in at least some instances) had its 37 replaced by a 75 of the type formerly found only on the Pz. Kw. IV or heavier models.*

largely fall into four classifications: surprise; powerful and instantaneous fire at close ranges; breadth, flexibility, and speed; and relative invulnerability.

#### TANK CHARACTERISTICS

So much has been written and said about the prowess of tanks that the weaknesses of these armored vehicles have sometimes been minimized. These might be listed as follows: relative blindness, with vision limited to observation slits of one type or another; field of fire which despite the 360° traverse of the turret is limited especially in depression and elevation; vulnerability of tracks—which can be easily thrown or broken in numerous ways and without which the tank, except for a few types, is rendered immobile; rapid exhaustion of crews as a result of confinement in close and uncomfortable quarters; fuel requirements which are difficult to meet—most tanks cannot go more than 100 miles without refueling; ineffectiveness at night, when mechanized forces are especially vulnerable (as the Germans found out repeatedly).

With this as a brief background, let us look at a tank as an antitank gunner would see it. What are its most vulnerable and least vulnerable parts?

The tank is becoming more and more invulnerable to small arms fire. Observation slits now generally employ indirect vision through a periscope which is virtually impenetrable to such fire. Modern aprons for the turret rings (where turret and hull join) make jamming of the turret by small arms fire highly improbable. Increasing sturdiness of the suspension system, including the tracks, has made this portion also relatively safe from small arms fire.

Many experts maintain that .30-caliber riflemen and machine gunners should not waste ammunition and disclose their position by opening fire on tanks. However, .50-caliber machine guns are considered effective against tracks and other parts of the suspension system.

When artillery is concerned, the tank is by no means so invulnerable, with the degree of vulnerability depending on the type of cannon used.



*Until they received American equipment, Britain used light tanks like this one in the desert. Small wadis keep engineer troops busy improvising bridges, even in dry weather.*

Aside from observation slits and similar small targets which are too difficult to hit, the suspension system is the most vulnerable point for artillery fire of all kinds, from 20-mm up. It covers a fairly large area and a well placed hit will stop a tank of nearly any size or type. Smashing the driving sprocket, idler, or one or more bogey wheels will necessitate major repairs before the tank can again move.

An excellent target is the side of the tank: its slope is not nearly so great as that in front, and the armor plate is thinner. The area immediately above or below the upper part of the track is a favorable target due to the comparatively perpendicular slope of the surface. Armor on the rear of the tank is even thinner than that on the front and side, and is easily penetrated. The Russians are said to have taken advantage of this condition by permitting various German tank units to pass by and then opening fire from the rear. The lightly armored bottom and top of a tank are extremely vulnerable, but the difficulty of getting an opportunity for such a shot is quite obvious.

Most heavily armored is the front part of the turret. The tank normally seeks to fire from a hull defilade position, and when this occurs the well protected turret front is the only visible target for the antitank gunner. The front part of the tank hull is the next most invulnerable part of the tank. Heavy armor and its steep slope make penetration of this part difficult. Thus the tracks and turret ring are still favorable targets, even when the front of the tank is the only visible part.

#### ANTITANK CANNON

The effective answer to the tank today is the same one that wrecked nearly all the tanks destroyed in World War I. Artillery provides the main defense, although there are other effective means such as Molotov cocktails; phosphorus, sticky, and percussion grenades; flame throwers; antitank rifles; wide-deep ditches; various engineering traps; and cement, iron, and even wooden obstructions.

#### *Germany*

The German Army, which long has laid claim to the most effective antitank weapons, has a bewildering number of antitank cannon.

The small German 20-mm automatic cannon with a velocity of 2900 f/s is used mainly as an antiaircraft weapon but has had some success against armored cars and very light tanks.

Some authorities consider the best antitank gun today to be the small Guerlich 28-mm gun. Its shell is compressed by a tapered barrel to only 20-mm by the time it leaves the muzzle with a velocity of 4750 f/s. This gun is semiautomatic and weighs only 541 pounds; barrel life is limited to about 400 rounds. It is highly probable that the gun is not as effective as it is spectacular.

Germany's standard antitank gun at the beginning of this war was the 37-mm Rheinmetall. This weighs 970 pounds, has a muzzle velocity of 2657 f/s, and had a penetrating power (at the beginning of the war) of 1.3" of armor plating at 722 yards. Its rate of fire is 25 shots a minute. The most effective range is considered to be 400 yards.

The Spanish Civil War proved to the German

experts that while the 37-mm gun could destroy light tanks, it was of little value against the heavier ones with armor plating over an inch thick. Immediately the rapidly expanding army of the Reich began to build larger and more effective antitank guns. [The Allies (led by the backward French military leaders) came to the conclusion—without proper research—that their 20- and 25-mm antitank guns were sufficient.]

Recent reports indicate that the Germans have a 42-mm antitank gun which tapers off to 28-mm at the muzzle. Both HE and AP ammunition are fired from this gun, as in the case of the older 28/20 weapon.

In 1940 the German Army began to use a 47-mm AT gun which is also suitable for AA use. Its muzzle velocity is around 3,000 f/s, and its weight 1,980 pounds.

During the 1941 campaigns in Greece and Egypt the Germans began to use a new 50-mm gun. This may supplant the 37-mm as the standard AT gun of the Nazi forces. Its weight with carriage is 1,980 pounds and its muzzle velocity 2,800 f/s; it fires a solid projectile weighing 4½ pounds. Like many of the German antitank guns, it has a double thickness of shield with a space between. This gun has met with considerable success against most tanks, although it has apparently had considerable difficulty in stopping the heavier types of Russian tanks. This gun is now being used in the tanks of German Panzer Divisions.

75-mm howitzers and guns have not yet been used as extensively for antitank weapons as in other countries.

The Germans have used their 77-mm gun quite extensively for AT work. It has proved well adapted to this, although overshadowed by the better 88-mm. It has been used in German medium tanks for combating enemy tanks.

Next comes the most famous gun in the German Army, the 88-mm (3.465") all-purpose gun. Its rate of fire of 30 shells a minute and velocity of 2,800 f/s have made it one of the mainstays of the German defense against tanks. Surprisingly, this is an old gun secretly designed 10 years before Hitler came into power. A U. S. military attache was permitted to inspect it thoroughly in the fall of 1935. The outside world seeing these guns on parade in Berlin long before the war began saw in them simply a conventional antiaircraft gun; their true nature did not become apparent until after the invasion of Poland.

This gun has a mobile carriage and can easily be moved by a tractor or similar prime mover. It can travel at 30 m.p.h. and fire as soon as its prime mover stops. It can be elevated to 90°, depressed to -3°, and traversed 360°.

This gun is given much credit for the destruction of 230 of the 300 British tanks used in the great Allied desert offensive which ended in disaster at Knightsbridge, June 13, 1942. Little wonder that it is known as "Rommel's pet." Part of its success probably is due to the fact that the best the British could put in the field against it in Libya was the 25-pounder, which fires ten shells a minute at a lower velocity.

105-mm howitzers have been successfully used by the Germans on many occasions. In the Russian campaigns they have been found sited for antitank work. In his recent *Modern Battle*, Lt. Col. Paul

### GUN DUEL

What is the relative strength of British and German artillery pieces? These lists of guns currently in use will act as a guide.

BRITISH		GERMAN	
1. 2-pdr	40-mm caliber; projectile weighs 2.4 lbs.; rate of fire: 15 rounds a minute. Sure death at 400 yards.	1. 37-mm	Projectile weighs 1.9 lbs., otherwise comparable to 2-pounder.
2. 6-pdr	Projectile weighs 6¼ lbs. More powerful than the German 50-mm and with better range.	2. 50-mm	Projectile 4½ lbs. Less powerful than British 6-pounder or 75-mm., and with shorter range than 75-mm.
3. 75-mm	(in General Grants) Equal to 6-pounder in punching power.	3. 75-mm	Lower muzzle velocity than the American 75. Fires a 12-14 lb. shell.
4. 3.7" AA	High - velocity weapon, equal to German 88-mm if used on mobile mounting. Fires heavier projectile than 88-mm, and will penetrate armor on any German tanks.	4. 88-mm AA	16,000-yard range, fires 20-lb. shell at rate of 15-20 rounds a minute. Caliber less than British 3.7.
5. 25-pdr	Same caliber as 88-mm German, lower muzzle velocity, shell 5 lbs. heavier than 88-mm. Rate of fire: 8 rounds a minute. Range: 13,000 yards. Good penetrating power.	5. 75-mm	Field gun on tank undercarriage. Inferior to British 75-mm. Can be fired only when stationary.
6. 4.5" howitzer-gun	Slow firing, but with great range. Fires 55-lb. shell 20,000 yards.	6. 105-mm	Mountain gun (converted). Shell 30 lbs. in weight. Less range than 4.5".



Britain's versatile 25-pdr. is now found mounted on the Valentine tank. This provides a fleet, mobile weapon, although our M7 probably has the advantage. The piece shown here is with the British First Army in northern Tunisia.

W. Thompson tells of an incident where two waves of 32-ton French Char B tanks broke through German 37-mm AT guns, only to be totally annihilated by the 105-mm howitzer batteries.

#### ITALY

The once overrated Italian Army is equipped with numbers of various types of antitank guns which have not proven nearly so effective as those of the greater Axis power across the Alps.

Its Breda 20-mm heavy machine gun is a dual purpose AA and AT gun. It fires several types of high explosive, armorpiercing, incendiary, and tracer ammunition. Its effectiveness as an AT gun is limited to very light tanks.

Especially in their tank divisions the Italians have adopted a gun similar to the German 50-mm. The 65-mm artillery piece can be used as an AT weapon under favorable circumstances.

A 76-mm dual purpose AA and AT gun has been developed. This is primarily an antiaircraft gun.

Another dual purpose Fascist gun is the 80-mm, which has seen service in recent Libyan campaigns.

#### JAPAN

As yet the Japanese armed forces have not met a formidable armored force. When the Army of Nippon meets hostile tank units in strength, the real value of her antitank weapons can be accurately assessed.

20-mm Oerlikon automatic cannons are in general use in the Japanese Army as antiaircraft weapons. This gun would be effective against armored cars and tankettes at close ranges. Its rate of fire of 450 rounds per minute contributes greatly to its usefulness against fast, lightly armored vehicles.

The Japanese have a 37-mm AT gun, model 94, which is not to be confused with the 37-mm which is similar to our own World War one-pounder. This 37-mm AT gun is only about 2 feet high and thus easily concealed with a minimum of preparation. Without a doubt this gun (which is much inferior to our own 37-mm AT gun in velocity, weight of projectile, mobility, and range) will not prove effective against tanks of any but the light class. It might, however, prove a good first line protection for infantry troops, against armored cars and tankettes.

Japanese tanks have been using a 47-mm gun which should prove useful as an antitank weapon.

A 70-mm infantry accompanying gun has been used against tanks on some occasions. While good for many purposes, it has proven a failure in general AT work. Its rate of fire is 10 rounds per minute and it weighs only 101 pounds.

Also available as AT weapons under favorable circumstances are a 75-mm gun (Model 1906), 75-mm mountain gun (Model 94 (1934)), 105-mm gun (Model 1925), and 105-mm light howitzer (Model 91 (1931)). These weapons as a whole may prove to be too cumbersome to become effective antitank guns. Rather meager reports indicate that the light artillery of the Japanese has had some success against British tanks in Burma. The armored action in this campaign was limited, and hardly a fair test of the anti-mechanized power of Nippon.

#### GREAT BRITAIN

Although the British have a 20-mm gun, the smallest cannon that has seen appreciable service in the present war is the 37-

mm AT gun. As experience in Libya has shown, the British 37-mm AP projectile weighing about a pound and a half is sufficient to knock holes in the armor of even the German Mark IVs. Whether the tank would be stopped would depend on where it was hit.

Standard British AT gun at the beginning of the war was Vickers 40-mm (two-pounder) gun. It is a semi-automatic cannon with a muzzle velocity of 2,400 to 2,600 f/s. Weight is approximately 1,848 pounds, rate of fire 22 shells a minute, and the penetration of its projectile 1.5" at 700 yards. The 2-pounder has a maximum range of 2,000 yards; however, the effectiveness increases considerably as the range decreases: maximum effective range is 600 yards.

The British have recently adopted a 57-mm antitank gun (6 pdr.). It has been found to be an excellent destroyer of mechanized vehicles, and is now supplanting the 2-pounder.

The British 18-pounder, originally modelled after the French 75-mm gun but surpassing it in caliber by 1/3 of an inch, has seen action as an antitank gun in Libya. It has not, however, played the important part of the 25-pounder in opposing the Panzer Divisions.

In the desert campaigns the 25-pounder, as the principal British light artillery piece, revealed itself to be a fairly good antitank gun. Its rival (the German 88-mm) has made it appear less effective than it really is. Although the 25-pounder has a slower rate of fire (only 10 shells a minute), is less mobile, and has a lower velocity than the German gun, the devastating effect of its shell makes it a capable antitank weapon even at great ranges: tanks have been stopped at ranges up to 9,000 yards in the desert, although such extreme ranges are seldom practicable.

British artillery of a larger caliber has not as yet played a very important part in antitank work.

#### FRANCE

Standard French antitank gun was the ineffective 25-mm Hotchkiss semiautomatic cannon. As Major F. O. Miksche points out in his *Attack*, the Spanish Civil War (which taught the Germans and Russians so many valuable lessons in antitank methods and tactics) only confirmed the backward French military leaders in their reliance on the insufficient 20-mm Oerlikon AT gun. This has a velocity of 2,953 f/s, a rate of fire of 40 shells a minute, and a claimed penetration of 1.76" of armor at 550 yards. Although it can knock out armored cars, it proved of small value against tanks with the exception of the light types.

A larger 47-mm, Model 1939 (Schneider), has received almost universal approval. In *Tank-Fighter Team*, Lt. Gerard (a French Officer) tells how this weapon repeatedly stopped German tanks in the Battle of Sedan and the later Battle of France. Its muzzle velocity of 2,800 f/s throws a 3.8-pound projectile through 2.4" of armor at 600 yards. The chief trouble with the 47-mm was the insufficient number on hand at the fall of France. It was the same old story: "too little and too late."

First built in 1897, the historic French "75" was called upon frantically by the French Army at the Sedan disaster, and later to stop the onrushing Panzer divisions which had heedlessly swept through the small 20-mm guns. The fact that the "75" was incapable of performing antitank work with complete success is testified to by the results of the campaign. Using a 15-pound projectile, the gun can fire for some purposes (other



than AT work) at ranges up to four or five miles. One of the chief difficulties as an antitank weapon is the difficulty of aiming it rapidly enough, but in the Dieppe raid by the Allied forces (including tanks), the Germans did use some French "75s" as AT guns.

As an indication of how much the French were forced to rely on the 75-mm and larger guns, it is sufficient to point out that in the latter phase of the Fall of France nearly two-thirds of the French divisional artillery was set up for antitank defense.

#### RUSSIA

Modern mechanized warfare did not catch Russia surprised: Soviet military leaders had followed developments in the Civil War in Spain almost as closely as did the German.

Russia's 37-mm AT gun is similar to the German Rheinmetall. It fires a 1.5-pound projectile at a velocity of 2,632 f/s, weighs 737 pounds, and its characteristics and effect on armored vehicles are similar to those of the other 37-mm weapons previously discussed.

The M1932, 45-mm AT gun is generally accepted as an excellent weapon against tanks. Weight is only 935 pounds, rate of fire is 30 rounds a minute, and velocity 2,492 f/s. In Spain it was considered the best antitank gun, not excluding the Rheinmetall 37-mm which it closely resembles in appearance.

Putilov 76.2-mm light field gun has seen commendable service as a destroyer of Hitler's armored vehicles. So successful has it been as an artillery piece that captured ones were sent to reinforce Rommel's position.

The Soviets have also developed an excellent M1933 76.2-mm AA gun on a special AT carriage. This gun is distinguished from the M1936 76-mm field piece by the angularshaped top to its shield, tapered gun tube, and usually by a muzzle brake as well. Just as in the case of the Nazis, the Russians have made extensive use of antiaircraft guns as a part of their antitank defensive system: Soviet AA guns have repeatedly stopped major German tank drives.

According to Russian reports, batteries of heavy guns and howitzers up to 152-mm have proven to be valuable tank destroyers. The giant 152-mm (6") gun, mounted on a 52-ton tank chassis, is a larger tank gun than even the Germans have. It is thought to be designed especially as an antitank weapon.

Although not a cannon, no such discussion as this could be complete without mention of the unique Russian long-barreled 57-caliber AT rifle. Two men are needed to carry it. Recoil is slowed down by a muzzle brake to prevent injury to the firer. It is considered by the Soviets as one of their most effective weapons and is given much credit for the stand that Russian forces have made against the Nazi armored force.

#### UNITED STATES

Our standard AT weapon was the 37-mm gun, an improved version of the 37-mm Rheinmetall. It looks quite like a

miniature 75-mm field artillery gun, except for its proportionally longer barrel. The rate of fire of our 37-mm is 25 shots per minute with an effective average range of approximately 400 yards. This gun with its old ammunition proved an able adversary for the German tanks in Libya. Now with the new ammunition, which makes it comparable to the British 2-pounder and the French 47-mm gun, it should be a partial answer to the threat of Hitler's armored forces.

The 75-mm antitank gun is now widely employed by our armored forces. Tank destroyer units as well as tankers are being trained with this weapon. It is exceedingly mobile and possesses a high rate of fire power with new AP ammunition. It has been stated that our 75-mm AT gun has been so improved that it is equal to or superior to the German 88-mm.

Then there are our 75-mm and 105-mm howitzers that may be and will be used when a more powerful antitank weapon is desired. Even 155s were effectively used for this purpose in North Africa.

Experiments are now being conducted on heavy dual purpose antiaircraft and antitank guns. This we know from a statement of Major General Campbell, in *Army Ordnance*, September-October, 1942, which we quote:

"We, too, have double-purpose weapons. We're not saying what they are, but I can say that they are heavier in fire power, they possess higher muzzle velocity, and carry greater explosive charges than the German 88-mm gun."

#### CONCLUSION

Reports that 230 out of 300 British tanks used at Knightsbridge in the Libyan campaign, June 13, 1942, were destroyed and that the Reds have destroyed 2,200 Nazi tanks before Stalingrad give proof that the tank has at last met a formidable adversary in World War II. The days of the bewildering sweeps through Poland and France have given way to stubborn and devastating resistance to the mechanized might when sufficient modern antitank cannon are available.

In their great drive against Rommel's forces, the British under General Montgomery used planes, artillery and infantry attacks to blast a way through antitank guns and mine fields for the armored units. Only when this path was made for the tanks were they sent rumbling into an overwhelming attack. The present day antitank defenses made it impractical to use tanks in a breakthrough operation such as was done at Sedan and elsewhere during the first years of this war.

As to the part that antitank guns have played in causing this recent momentous reversal, the Red Army's field regulation, as quoted in *THE FIELD ARTILLERY JOURNAL* of November, 1942, presents the answer:

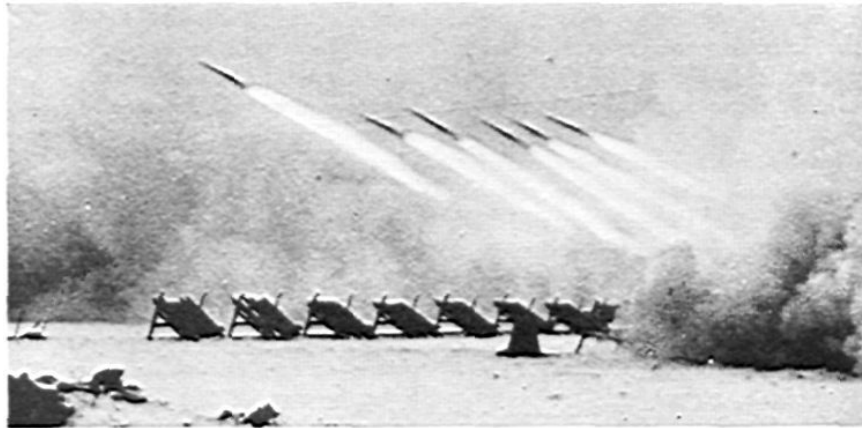
"Basic means of disabling tanks and of repelling tank attacks is artillery fire at pointblank range. Antitank guns are the chief weapon for antitank defense."

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#### FILM BULLETIN

*Handling Ammunition in the Middle East* is the subject of Film Bulletin No. 61, recently released.

*Russia employs rockets in mass, projectors being installed in banks reminiscent of Livens projector installations. Rockets shown here (at Stalingrad) were fired from a second line of launchers behind those seen below the rockets themselves.*



# RE-BIRTH OF THE WAR ROCKET

By Capt. Andrew Kamarck, FA

The real "secret weapon" of the war is the war rocket; that is, the rocket-propelled projectile as differentiated from signal pyrotechnics. While attention has been focused on the tank and the airplane, a new weapon has quietly arrived on the scene. That the war rocket cannot be idly dismissed is shown by the fact that three of the leading military powers—the Soviet Union, Germany, and the United States—have each adopted one variation or another of a rocket-propelled projectile. As field artillerymen, this development is of particular interest to us since the war rocket has come on the scene partly to do a job that was formerly the field artillery's.

A rocket, of course, works on an exactly opposite principle from that of a gun. A rocket is propelled by the recoil from the projectiles it shoots. A rough approximation of what happens would be propelling the tube of a gun to the rear by the recoil resulting from firing a series of projectiles one right after another out of its muzzle. In a rocket, the projectiles are the molecules of the gases fired out of the base of the rocket; the recoil, or the force of the gases, acting on the base of the rocket propels the rocket.

Not only the newest weapon on the battlefield, the war rocket is also one of the oldest. It is actually about a century older than the gun itself, and over the past 700 years has been the chief potential rival to the gun. The idea of using a projectile propelled by rocket power in warfare has been an intriguing one as long as gunpowder has been known. Willy Ley points out that the first known use of war rockets was by the Chinese against the Mongols in 1232.<sup>1</sup> Guns, on the other hand, were not invented until almost a hundred years later. After considerable experimentation, it was generally agreed by 1600 that war rockets were not practicable and the idea was abandoned in Europe.

Two hundred years later, around 1800, the British in India had a number of disagreeable experiences as a result of encounters with Indian war rockets. These rockets were not efficient as casualty-producers, but had a considerable

psychological effect on the opposing forces. This contact inspired new interest and experimentation in the war rocket. In 1804 a British army officer, William Congreve, finally produced a fairly good war rocket (compared to the artillery of that time).

The Congreve rocket became the secret weapon of its day. It was first used in battle in a British naval attack on Boulogne in 1806; although sources differ, it appears not to have had much effect. But in 1807, in the British attack on Copenhagen, the 20,000 rockets sent into the city were largely responsible for burning most of it down.

As a result of the success of the Admiralty the British Army converted a few artillerymen into "The Rocket Brigade." In its first battle in September, 1813, this unit did not do very well. A month later in the Battle of Leipzig, however, the small rocket detachment assisted materially in some minor actions on the battlefield. In the same month a rocket attack on Danzig fired the food storage buildings so that the city could not withstand a siege and, therefore, had to surrender.

In 1814 the British "secret weapon" was used against the American Army. At the Battle of Bladensburg in August, 1814, Lt. Col. Goddard states ". . . a flight of these ungainly projectiles directed against Stansbury's brigade had caused the regiments of Schultz and Ragan to break and flee in wild disorder. As a result, the American flank was turned and . . . the day lost. Thus we may indirectly (or perhaps directly) thank Congreve and his invention for the capture and burning of Washington which followed. . . ."<sup>2</sup>

In the following month the British navy employed war rockets against Fort McHenry. The psychological impact of these projectiles is still present in our national anthem as "the rockets' red glare, the bombs bursting in air." Both "bombs" and "rockets" were the British war rocket.

After the Napoleonic Wars, all the major European powers

<sup>1</sup>Willy Ley, *Shells and Shooting*, appendix "Rockets in Battle." This is the best discussion of war rockets in English that I know of.

<sup>2</sup>Army Ordnance, May-June, 1939 (quoted in Willy Ley, *Shells and Shooting*).

adopted the war rocket as a weapon. Special rocket corps or rocket batteries within the field artillery itself were organized for this purpose. Rockets remained as an embryonic threat to the field artillery to as late a date as 1865. The successful introduction of rifled cannon with their superior accuracy around this time resulted in abandonment of the war rocket by the European armies. Still, the British are reported to have used large numbers of war rockets successfully as a substitute for mountain artillery in their Abyssinian Expedition of 1867. In fact, it was not until 1885 that the British disbanded the last of their rocket troops. And thus again the war rocket disappeared from the battlefield.

There is little information as to the actual use and effectiveness of war rockets. At first the rockets were simply laid on the ground, pointed in the general direction of the enemy, and then gingerly fired.

Soon, however, rocket launchers were developed. These were nothing more than round tubes, open at both ends, which could be aimed at the enemy. When used against untrained troops the rocket was most effective. It would dart towards the ranks of the enemy spitting fire from its rear. As it struck obstructions it would glance off and shoot away in another direction. The burning gases shooting out from the back had an awesome effect, as well as being an incendiary agent.

The British used chiefly rockets weighing 3, 9, 12, 24, and 32 pounds, although rockets weighing up to at least 300 pounds were made. These rockets were used to carry either solid shot or high explosive. British rockets of 1870 may be regarded as representing about the highest development of the war rocket in the 19th century. The 24-pound rocket at this time was two feet long, four inches in diameter, and enclosed in a cast iron or steel container (that is, roughly about the size of a complete 105-mm round). It carried three pounds of wet guncotton as a bursting charge which exploded the rocket on impact; the propelling charge consisted of 9½ pounds of a mixture of saltpeter, willow charcoal, and sulphur. The Mark IV rocket could attain a range of more than 4,000 yards, although the average range was somewhat less than 2,000 yards.

In spite of the abandonment of the war rocket in the 19th century, the manifest peculiar advantages of rocket-propelled projectiles continued to revive interest time after time in the possibilities of developing a suitable war rocket. During World War I the United States and some of the other belligerents experimented with the idea, but a successful rocket weapon did not appear again upon the battlefield. Between World War I and World War II, experimentation on rockets was carried on principally in Germany and in the Soviet Union. In the United States, Dr. R. H. Goddard of Clark University almost alone did a great deal of valuable work in this field.

Abstractly, there are many universally recognized advantages of rocket-propelled projectiles. As compared to a field artillery shell, a rocket projectile is almost unlimited in size. The problems involved in manufacturing gun tubes capable of withstanding the necessary stresses set up from firing large shells are completely side-stepped in the case of the rocket.

Another major advantage of the rocket is greater mobility than is possessed by artillery. Whereas the mobility of artillery is primarily dependent upon the size and weight of the gun, the

principal limiting factor in the case of the rocket is the weight of the projectile. The rocket launcher at times may act as a limiting factor, but in any case it is much lighter than an artillery piece.

Experience has shown that the velocity of bombs from gravity and even with the added velocity from dive bombing has not been great enough for sufficient accuracy against moving tanks nor even for high enough efficiency against wellarmored ships. To meet this need the rocket-propelled projectile appears to be most suitable. And both the Russians and Germans have adopted the rocket for just this purpose.

As the rocket is propelled by recoil, there is no necessity for providing a complicated recoil mechanism for the rocket launcher. More important is the fact that this freedom from the kind of recoil that we have in guns eliminates one of the major difficulties of firing large projectiles from airplanes. The recoil shock of large guns has been an important factor in preventing the mounting of a larger weapon than the 37-mm gun in airplanes. Yet for the purposes of anti-tank work, a projectile larger than 37-mm is necessary.

This same absence of recoil makes it possible to develop a weapon which can be aimed from the shoulder, and yet launch a much larger projectile than can the rifle. It is the tank again which has created the need for a weapon which can hurl a sizeable projectile and yet be as light and mobile as a rifle. This need is obviously met by the new anti-tank rocket weapon that the United States has developed.

Greater potentialities in the massing of fires might be considered an advantage of the war-rocket. That is, the same technique that is employed in the use of Livens projectors might be adopted in laying down a rocket concentration on an area. Obviously, the range of possibilities for massing fires is more elastic for rockets than for artillery, limited as the latter is by the number of guns available and the limitations on the rate of fire per gun. But of course both range and accuracy are now less with the rocket, even though a number of military experts have pointed out that the rocket *potentially* should reach much greater ranges than could ever be reached by artillery.

With all these advantages for the war rocket, the question legitimately may be asked why the rocket has not completely supplanted field artillery. The reason, of course, is that the rocket also possesses important disadvantages. Field artillery was able to exterminate the rocket in the 19th century because of the superior accuracy of the new rifled cannon. The major difficulty encountered by the rocket was that no one solved the ballistic problems of a projectile whose center of gravity was continually shifting. That is, as the propelling charge is consumed in the base of the rocket, the center of gravity is constantly moving forward and the projectile gets more and more nose-heavy. By proper inclination of the venturi tubes it was possible to secure rotation of the projectile in flight which improved accuracy somewhat. In spite of this, however, the 19th century was never able to develop a war rocket which could be considered anywhere near accurate.

Another major drawback to the rocket is the fact that as a projectile it is not as efficient as an artillery shell, which is 100% projectile whereas a part of the rocket must be taken up with the propelling charge. As a corollary, it is easier to manufacture a shell than it is a rocket.

The drawbacks of the war rocket were great enough to

prevent its use in the 20th century until the present war. Now, however, changed conditions of warfare and technical advances in manufacturing have been great enough to lead to re-introduction of the war rocket. This conforms of course to the familiar pattern of development in the history of weapons. Breech loading and rifling, for instance, were likewise invented centuries before the progress of industrial techniques made them practicable.

The threat of the tank has been the principal factor in the resurrection of the war rocket. As it happens, in its use against tanks the rocket side-steps its own major disadvantage. That is, the difficulty of a shifting center of gravity is minimized both by the short range (with its short time of flight) at which the antitank rocket must be fired, and by the fact that the trajectory is comparatively flat for these short ranges.

The first war rocket in this war appeared on the Russian front. It proved to be one of the effective surprises that the Red Army sprang on the Reichswehr. Though the Russians kept the secret as long as possible, it eventually came out. As far as I know, the first description of this weapon in English appeared in the British magazine *The Aeroplane* on May 29, 1942:

"Probably the most important tactical advance in air weapons is the rocket bomb invented by the Russians and used by them from the *Hiuchin Stormovik*—erroneously termed a dive bomber—and from the *Hawker Hurricane*. Few details have been given about the rocket bomb and the Germans have confirmed its potency by an ominous silence on the subject. However, the Russians have said enough about it for its general principle to be gathered. Apparently the rocket bomb is slung on a guide rail under the wing of an aeroplane intended for low-attack work. The machine is flown low down and aimed at the target in much the manner of a ground strafing



Germany's 6-barreled rocket projector is apparently mounted on a modification of the carriage used with her old 37-mm antitank guns. Ammunition packing case indicates that projectiles are about as long as the barrels.

cannon-fighter. When the sights are on the target the electrical firing button is pressed and the bomb is projected forward by rocket apparatus in its tail. The effect is the same as that of a very large low-velocity cannon shell.

"The advantages are great hitting power sufficient to knock out tanks and greater accuracy of bomb delivery than either dive bombing or low-level attack bombing. The disadvantages are that the rocket apparatus obviously reduces the weight of the charge in the bomb and that, compared with the fighter armed with big cannon, relatively few projectiles can be carried.

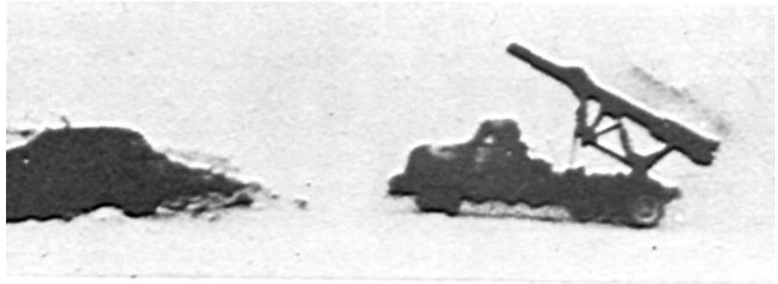
"There can be no doubt that for close-support work with troops the Russians have evolved a very fine weapon."<sup>3</sup>

*The Aeroplane* returned to the subject in November 1942 stating:

". . . The need for the air 'tank buster' is greater than it ever was. And until we have it we cannot exploit true air superiority to its full advantage.

"At present no gun of light enough weight and high enough rate of fire has been evolved which could be used with really devastating effect from the air against the tank. The 37-mm cannon is not big enough. The most effective solution does appear to lie in the Russian rocket bomb. Intensive development in this direction should produce a formidable weapon."<sup>4</sup>

As a tribute to the effectiveness of the Russian rocket bomb, it has been reported that the Germans likewise now have adopted a rocket bomb for armor-piercing work. The German rocket bomb is believed to be designed for use against battleships and heavy cruisers and against heavy land steel and concrete fortifications. Rocket propulsion is used in order to achieve the high velocity necessary to penetrate the armor of



Russian rockets attain considerable size, as is indicated by the enormity of this self-propelled launcher.

the target.

Probably the most dramatic victory won by the war rocket over the gun in the present war has been that of the American anti-tank rocket, the "bazooka." Maj. Gen. Levin B. Campbell, Chief of Ordnance, has stated that the "bazooka," "carried in the hand of a soldier, can destroy any enemy tank on the battlefield today. This weapon has been successfully used by our forces in Africa to destroy fortifications and tanks. It is so simple and yet so powerful that any foot soldier using it can stand his ground against anything which may attack him." Gen. Campbell tells of a battle in North Africa in which an American soldier fired his "bazooka" at an enemy tank, but missed and demolished a tree instead. "The tank commander, an experienced officer, surrendered. The Americans were astonished. The tank commander explained 'When you start firing 155-mm guns at tanks, it's time to surrender!'" The fact that the field artillery itself has found this war rocket useful for its own antitank protection is a humbling fact for advocates of the gun.

Another field for the war rocket in this war, according to sketchy reports, has been pioneered by the Germans and Russians. That is, rocket weapons have been developed which attempt to capitalize on the advantages of the rocket as a means of massing fires. The March FIELD ARTILLERY JOURNAL carried a picture of a German rocket launcher captured by the Russians at Veliki Luki. This rocket launcher

<sup>3</sup>"The War in the Air," *The Aeroplane*, May 29, 1942, pg. 601.

<sup>4</sup>"The War in the Air," *The Aeroplane*, November 6, 1942, pg. 530.

had six tubes of 150-mm caliber mounted in a circle like the cylinder of a revolver. It fired projectiles weighing around 50 pounds and was said to have a range of 6,000 yards. The Germans also are known to have other rocket launchers which fire even heavier projectiles weighing over 150 pounds, but, it is believed, for shorter ranges. These rocket launchers are used in batteries for firing concentrations. The Russians too have developed similar weapons. The German Army periodical, *Militaer-Wochenblatt*, described one of these Russian rocket launchers as follows: "Shells are fired from a type of firing apparatus on the rocket principle. The firing apparatus holds 42 projectiles arranged in three superimposed rows. The firing apparatus is mounted on a motor truck."<sup>5</sup>

In addition to the old familiar use of rockets as signalling devices and their new-old use as projectiles, rockets in the present war have found a really new job: that of providing energy for the movement of vehicles. The Germans appear to have been the pioneers in this development. The Luftwaffe is known to be making extensive use of rockets as a means of assisting the take-off of their planes. The German Dornier

bomber, DO-217, for example, uses rocket power to assist its take-off under heavy loads. It is also reported that in some instances when a plane is used as a tug for towing gliders, a rocket-assisted take-off is used. The British Air Ministry has recently made public the fact that the "Catafighters" (the pursuit planes catapulted from merchant ships to defend convoys against Nazi bombers) use rocket take-off.

It is clear from the available evidence that the rocket is being successfully used in this war. As a really "secret weapon," all armies concerned have shrouded in mystery the actual details of the construction and performance of their new rocket weapons. Do the Germans call their six-barreled rocket launcher a "Nebelwerfer" (i.e., fog-thrower) because it is used primarily to lay smoke-screens, or to conceal the development from us? Undoubtedly, all of the belligerents are developing or have developed still other war rocket surprises which have not yet been used on the battlefield. Probably not until after the war will we be able to get an accurate picture of the effectiveness of this new revival of an old weapon. At any rate, if widespread adoption and use of an arm on the battlefield is any test, it is certain that the war rocket has become an important weapon in the arsenal of modern armies.

<sup>5</sup>Command and General Staff School, *Military Review*, January, 1943.

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#### JAP RANGE FINDER

With reference to Lt. Clifford C. Petersen's article on survey conditions on Guadalcanal (page 322 of the JOURNAL for May, 1943), we have received the following remarks from Lt. Col. G. B. Jarrett, OD:

"There is an 80-cm base range finder (the M1914M1) which is for issue to the infantry. If this instrument could be made available to Field Artillery units operating under conditions described it should prove very useful.

"The American instrument measures ranges from 400 to 10,000 yds. Its weight with large tripod is 15.1 lbs. as compared with 16.4 lbs. for the Japanese instrument. The American 1-meter base range finder issued to the Field Artillery weighs 35.1 lb. with tripod and mount."

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#### NAMES OLD AND NEW

Tradition's value is well recognized by the 6th Armored Artillery Group. Its General Order No. 3, recently published, states:

"In order that the Field Artillery's famous name 'Caisson' will not vanish into oblivion, it is hereby promulgated that the name 'Caisson' will be applied within this command to that vehicle presently known as the 'Armored Trailer, M8.'"

New items must develop their own tradition. An example is the organic observation plane, which thus far has no generally accepted nickname. "Maytag Messerschmitt" has been strongly proposed, however.

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#### SAFETY STRAPS

Tractors, like jeeps and the old command cars, have safety straps so you won't fall out. Some artillerymen have fancied themselves as bronco busters, and ignored these little gadgets; they learned (the hard way) that these straps are not just ornamental. Tractors pitch and lurch; instead of nosing down into a ditch, they move just so far and then do a belly-whopper; their center of gravity is frequently so high that they can throw you for a literal loop. Remember, every little gadget has a meaning all its own; but the one meaning they all have in common is that they are furnished not just for looks, but *to be used*.

# ROUTES INTO EUROPE

## *A Study in Terrain*

### PART II—ISLANDS OF THE WESTERN MEDITERRANEAN

By Col. Conrad H. Lanza, FA

Four islands or groups of islands are located in the western Mediterranean Sea. In a war their possession affords distinct tactical advantages to whoever holds them. Airfields and naval bases on these islands permit surveillance over the surrounding seas. If held by the Axis they are a protection against an invasion of Europe and are of value for an invasion of North Africa; in addition they are a threat against the communications of Allies based on North Africa and an obstacle against an invasion of Europe. In Allied hands the islands would permit the assembly of troops thereon within a short distance of the European shore, and would safeguard their line of communications. Some of the islands have a certain economic value, but their tactical value far transcends this. It is quite probable that military operations will occur around these islands.

*The Balearic Islands* (from their position due north of Algiers, nearly halfway between Africa and Europe) are at present neutral under Spanish control. They possess excellent ports and bases. In the past they have been the scene of important naval operations, and would be useful now to either combatant.

*Corsica* covers the northern sector of west Italy and the southeast corner of France. While the Axis continues to hold it and can use its airfields and ports, it would be most difficult and quite hazardous for an expeditionary force to bypass it in

an attempt to go direct to the mainland. This island directly covers the great naval base at Spezia and has a flank position to the naval base at Toulon.

*Sardinia*, due south of and adjacent to Corsica, belongs to Italy. There is a great naval base at the north end at La Maddalena, and a very large land and sea air base at Cagliari at the south end. It is only 125 miles from this base to Bizerte, so that air forces based on Sardinia can readily operate in North Africa. Sardinia covers the south part of the west Italian coast. From Cagliari to Trapani (in Sicily) is about 180 miles. With these two places held by the enemy as they are today, an invasion fleet would have to run a gauntlet if it sought to reach the west Italian coast by passing south of Sardinia.

*Sicily* separates the Mediterranean into its west and east sections. It is just at the narrowest part of this sea, and only 80 miles from Tunisia. With certain islets which naturally belong to it, Sicily in enemy possession is a major obstacle to control of the Mediterranean—much more so than enemy-held Tunisia. From airfields in Sicily the seas can be covered in all four directions, and from its ports submarines and light naval forces raid the sea lanes. Presumably the enemy will make a hard fight to retain Sicily. Because of its importance it may become an early objective for an Allied attack.

#### SICILY

Sicily was probably at one time part of a land bridge from Europe to Africa. Along the 80 miles' distance from Cape



Bon in Tunisia to near Marsala, depth of the Mediterranean averages less than 600 feet and is nowhere over 1,200 feet, whereas elsewhere it runs to 6,000 feet or more.

The island is just under 10,000 square miles in area. It is usually referred to as triangular in shape; this is not quite so, as the west end is truncated. Its coast line, measured around all inlets, is 1,722 miles long. To defend such a line would require a very large garrison. As will appear later, a considerable part of the coast is so unsuitable for landings that defensive works and coast guards are likely to be found concentrated only in certain areas. If measured across headlands, the coast facing north and that facing southwest are each about 170 miles long. The east coast runs for about 125 miles and the truncated west coast 30 miles.

Sicily is separated from the Italian mainland by the Strait of Messina, which varies from 5 to 2 miles in width, the narrow part being at the north end. The water is about 1,000 feet deep, with a considerable current, so it would be difficult to mine. There are strong coast batteries on both sides of the Strait.

Sicily is volcanic. At the northeast end is Mount Etna, which is detached from neighboring mountains by deep valleys. It exceeds 10,000 feet in altitude and is snow covered except during the summer months; it is the highest volcano in Europe. It is extremely active: in the past 100 years there have been 19 major eruptions. A great volume of lava is generally discharged, which has occasionally interrupted main routes of communication parallel to the east coast. As in most volcanic regions, its lower slopes and surrounding vicinity are exceedingly fertile and covered with crops.

Parallel and close to the north shore, across the valley from Mount Etna, are the Peloritian Mountains. They do not exceed 4,000 feet in altitude and are quite narrow. They are very steep, however, and a serious obstacle. Farther west this range becomes the Nebrobian Mountains, which are of a different geological formation—rougher, wider, and with peaks exceeding 6,000 feet. From these mountains ridges extend southward into the central part of the island. Opposite the center of the south coast and extending toward the southeast corner of the island is a low range of hills, not over 2,000 feet in height. Slopes on the south side of the island are gentle and suitable for military operations.

There are no rivers of importance and none that are major obstacles.

Plains are limited. The largest is south and southwest from Catania on the east coast; several small streams flow through it. The other plains are at Milazzo and Palermo on the north coast and at Girgenti, Licata, Gela (Terra Nova), Comiso, Ragusa, and Noto on the south coast. All these plains have airfields.

The population of Sicily is around 4,000,000, giving an average density of 400 to the square mile. As a large percentage of the country is unoccupied due to mountains, the effective density of population is very high. Most of the people live in towns, few on the land or in villages. This condition arose during the medieval ages when wars were frequent and it was unsafe to live in the country. Towns are consequently quite numerous. They are usually of stone construction and readily convertible into centers of resistance. According to reports emanating from the enemy, they have been so converted. This may be an exaggeration, but it would be best to assume that they have been prepared for defense.

There is a good railroad net of standard gauge tracks. Rail connection with Italy is by a car ferry at Messina. This has been reported as having been effectively bombed by Allied planes on numerous occasions and should be out of commission.

Roads are good, as there is plenty of stone available and asphalt is a major product of the island, but they are often narrow and suitable for only one-way military traffic. Some roads pass through tunnels, and the railroads have many and long tunnels. Both roads and railroads can be quickly blocked.

Sicily used to be one of the granaries of the Roman Empire. It exported wheat until recent times; it no longer does so—not because of any decline in production, but from the increase in its own population, which now consumes practically all grain raised. Considerable acreage (particularly along the north coast) is devoted to the raising of olives, lemons, oranges, and similar fruits. These fruit and olive groves afford good cover to defensive positions. Before the war there were a large number of common farm animals, but these may have diminished. An invading force might count on securing locally citrus fruits but should not expect to secure more than limited amounts of other foods.

The mineral products are chiefly salt, sulphur, and asphalt, all of which are mined in large quantities. For the Axis Sicily is the main source for sulphur. Olive oil is another product especially valuable to present Axis economic needs, and to a lesser degree so are oranges and lemons. Loss of Sicily would be an economic blow to the Axis. The sulphur mines are mostly in the center of the island, salt mines at the west end, and asphalt mines in the southeast.

Except in the mountains the climate is mild, and military operations can be conducted at any season. It freezes occasionally, but snow is rare along the coasts and plains. Rainfall is scanty. Summers may be excessively hot.

Along the north coast the mountains are close to the shore line except at Milazzo, where there is a plain at the foot of the Peloritian Mountains, and Palermo (the center of the famous Concha d'Oro). The latter takes its name—literally *shell of gold*—from the extreme fertility and gleaming gold farms of a plain surrounded by mountains shaped somewhat like a seashell. Palermo, a modern city of about 400,000 people, with a magnificent port, is an excellent base except for damage from Allied bombings. In this vicinity the mountains are about 4 miles back from the waterfront.

Aside from Milazzo and Palermo, landings could be made elsewhere along the north coast, but the troops would find themselves in a narrow corridor between the sea and the mountains. As the stretch of land along the sea is densely covered with fruit and olive groves, and is naturally rough, there are numerous defensive positions. Milazzo would be a logical landing place for an advance on Messina, and Palermo for an advance through the passes over the mountains into central Sicily.

On the east coast are suitable landing beaches opposite the plain south of Catania. North of this city the lava fields of Mount Etna come down into the sea on a front of about 20 miles, forming steep cliffs. North of the lava, extending to Messina (inclusive) are good beaches. This section is stoutly defended.

The south coast is generally flat and regular in outline. There are small ports at Porto Empedocle, Licata, and Gela (Terranova di Sicilia), which normally export mineral products



in bulk. It would be possible to land at numerous places along this coast except in periods of bad weather.

The west coast has a good harbor and one good landing beach at Trapani, a city of about 75,000 population. Another port is Marsala (30,000 inhabitants), with a beach not as good as Trapani's north of the town. The last invasion of Sicily occurred in 1860, when General Garibaldi landed at Marsala. This was a very small expedition and can not be considered as establishing a precedent for present conditions.

Although the Mediterranean has practically no tide, there is an unusual sea movement along Sicily's south and west coasts. At irregular intervals the sea level changes within one or two minutes by a maximum of three feet. This may occur but once or may continue with sudden rises and falls every few minutes for hours or even an entire day. The reason for this curious phenomenon, called locally the *Marrobia*, is unknown. It is most frequent and intensive at the southwest corner of the island, at the small port of Mazzara del Vallo. If it occurs when barges are unloading guns, vehicles, or similar equipment, it may cause delays.

The geographical center of Sicily is near Caltanissetta, a modern town of about 55,000 inhabitants mainly engaged in the sulphur business. This is also the road and railroad center

of the island. Twenty-four miles to the east is Castrogiovanni, with about 27,000 people and also a road and railroad junction. This area would be the logical one for occupancy by enemy reserves until an invasion had occurred. Any part of the island can be reached from the vicinity of these two towns within less than a day. Depending upon where the invasion is, the enemy might elect to make his main defense in the center of the island. No matter where invaders may land, they will have to fight an up-hill battle.

Due to the restricted number of beaches giving access to important places or to the interior, it is likely that these favorable points for landing will be strongly contested. The rocky nature of the country makes possible the organization of numerous centers of resistance.

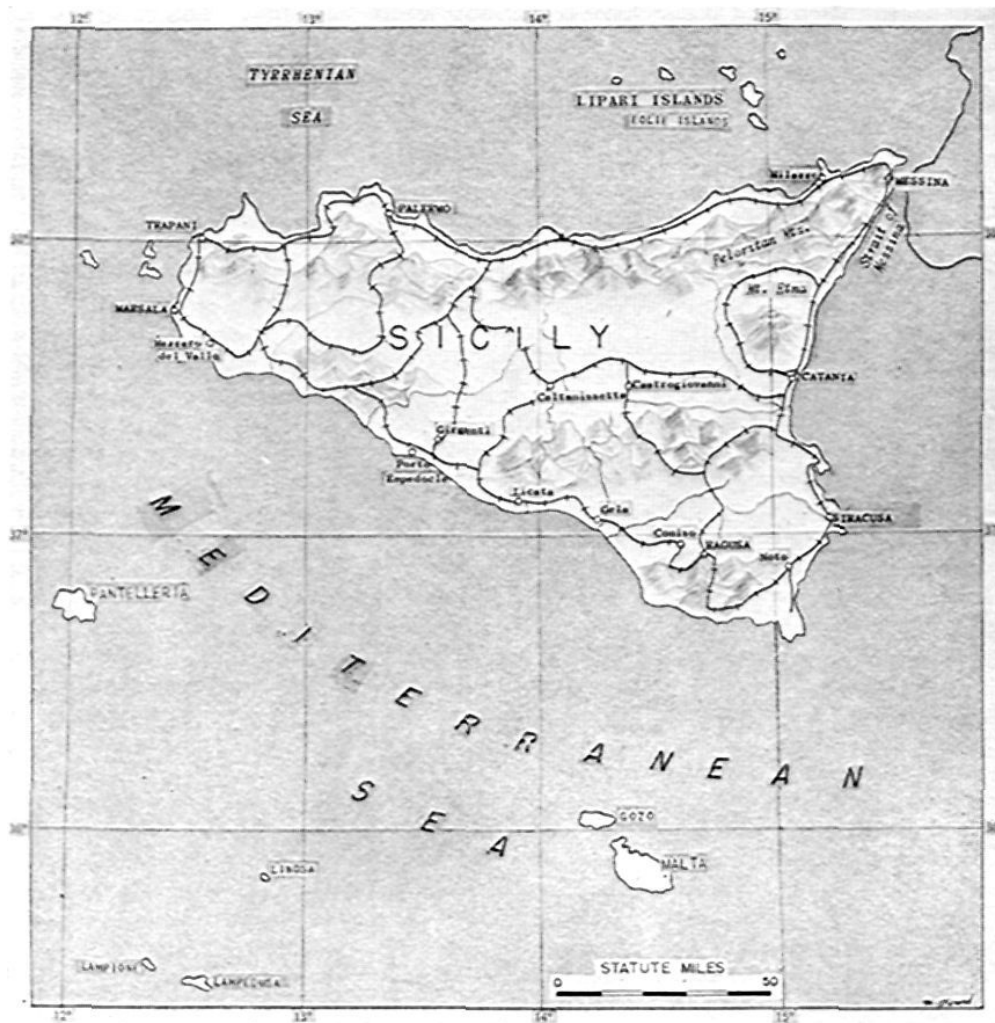
A landing on the north coast is indicated in order to secure possession of the first-class harbor of Palermo and the secondary one of Milazzo. An advance into the interior from these positions will at once encounter strong mountain positions, but the harbors could be held and utilized, subject to some shelling, without it being necessary to advance into the interior. The latter can be more conveniently attacked by landing on the south coast, especially if a flank attack can be made by landing simultaneously in the open country on the east which lies south of Catania. The several small

ports on the south side are the closest to Africa, and the terrain in their rear (having gentle slopes) favors an offensive.

Landings on the west coast could usefully supplement an invasion of the south coast, but if made alone the enemy's reserves might rather rapidly overwhelm it (or contain it) by holding a defensive position through Monte Grande (2,500 feet high), about 18 miles back of the shore line.

The seizure of Messina, another first-class port, would be most useful. To hold and utilize it, it would be necessary to hold also the opposite Italian mainland, since the batteries on this side effectively cover the strait. Without first securing these positions, Messina can best be attacked by landing at Milazzo and then advancing around the north and south sides of the Peloritan mountains rather than across them.

Sicily is an excellent base for operations against Italy or Greece. After its harbors and airfields were reconditioned, very large forces could be based on this island. Once taken, it



would be most difficult for the Axis to retake it; it is almost certain a hard fight will be made to prevent Allied forces from seizing it.

South of Sicily, in the very center of the Sicilian Strait, are several important islets. *Pantelleria*, sometimes spelled *Pantalara*, is 62 miles from Sicily and 44 miles from Tunisia. It is a volcano, 2,723 feet high, supposed to be extinct—but it is not entirely inactive, as steam and boiling-hot mineral springs exist. The island is a trapezoid in form, with an axis about 13 miles long extending northwest and southeast. Its area is about 45 square miles.

The population, about 8,000, is located mostly near the northwest end, where there is a small port. The island is very fertile and produces an excess of wine and grapes for export. As there are no streams, water is a problem; at times it has to be imported, even under normal conditions.

A small port, also called Pantelleria and situated at the northwest end, serves the island. It had a good airfield, a considerable garrison, and strong fortifications. As this goes to press, it has just surrendered following terrible bombardments from air and sea.

*Lampedusa* is 110 miles south of Sicily, 90 east from Tunis, and 110 west-southwest from Malta. It is only 7 miles long from west to east and 2 miles from north to south. The highest elevation is 400 feet. This island is strongly fortified and has an airfield. On the south side is a harbor suitable for motor-torpedo boats and submarines. There is good water.

*Linosa* is 30 miles north-northeast from Lampedusa. This is another extinct volcano, 610 feet high. Its population was last reported as 350 people, and according to latest information there is no airfield or garrison. Water is very scarce.

Of the foregoing three islets, the first two would make good air bases. Landings are possible only at the ports, small areas easily covered by the garrisons. It is presumed that the airfields were protected against seizure by air-borne troops.

As this goes to press, it has just surrendered following terrific bombardments from air and sea.

#### SARDINIA

This large island, which is slightly smaller than Sicily, lies 195 miles to its northwest. Its general shape approximates the imprint of a right foot pointing north. The length is 170 miles and the greatest breadth under 70 miles. Its coast line, very irregular, totals nearly 850 miles. On the north Sardinia is separated from Corsica by the Strait of Bonifacio, only 7½ miles wide and covered by batteries on both sides. Sardinia is 115 miles north of Africa, and its northeast corner is 135 miles west of Civitavecchia, the nearest point on the Italian mainland.

The area is approximately 9,200 square miles, population around 850,000. This density of population (92 per square mile) is the lowest in Italy.

The Italian language is generally spoken, but there are two native languages, unintelligible to each other and to Italians. These both contain many Latin words and expressions, and are in common use. A large part of the population is undersized—not over five feet in height. Farm animals—donkeys, cows, horses, etc.—are also diminutive. Various explanations have been offered for this unusual condition, such as climate, nourishment, or that the people are descendants of ancient pygmies; nobody knows the real reason, however.

Sardinia is very mountainous. Parallel and close to the east shore are a series of granite mountains under various names, varying from 4,000 to 6,000 feet in altitude. These are very rough and a decided obstacle to an invasion from the east side. On the west side are two ranges of mountains, one in the north and the other in the south, separated by the Gulf of Oristano and its tributary streams. These mountains are volcanic, inactive at this date, and under 4,000 feet high. In the southwest is a large mining development producing zinc, lead, and antimony, with smaller quantities of manganese, copper, and silver. Coal abounds, and there is some iron ore. These mineral resources are of value to the Axis.

Extending southeastwardly from the Gulf of Oristano to Cagliari is a large plain known as the Campidano. It is 60 miles long, from 7 to 14 miles wide and with a maximum elevation of 100 feet. This plain is very fertile and is the important area of the island. Northeastwardly from the same gulf is a narrower plain about 20 miles long and not over 5 miles wide. With these exceptions plains are small and few.

Wheat is the principal crop, but grapes and tobacco are extensively cultivated. Both African and European fruits abound. There are large forests in the mountains, including numerous nut-bearing trees. Prior to the war there were a considerable number of farm animals. Much of the soil is so stony that agriculture is limited.

Malaria is indigenous. The Italian government has done much to destroy the mosquito pest, and during the winter and spring no precautions need be taken. During the summer and autumn months, though, precautions are essential.

In the winter there is much snow in the mountains, but in the lowlands the climate is mild.

At the north end of Sardinia, just south of the Strait of Bonifacio, is La Maddalena, a small island on which there is a first-class naval base, strongly defended by permanent batteries. This is one of the three main bases of the Italian fleet, the other two being Spezia (southeast of Genoa) and Taranto (in south Italy). La Maddalena has double sea entrances to minimize danger of the fleet's being blocked in its refuge. High hills in the vicinity favor AA defense.

At the south end is Cagliari, which is the principal port and city with a population of nearly 60,000. This is a first-class air base, with fields and water surfaces for both land and sea planes. It is a major air base for operations in North Africa. This area is strongly defended. The city lies between two extensive salt lakes just back of the sea, one to the west and the other to the east. Back of the city and the salt lakes stretches the Campidano, already mentioned. Beyond the salt lakes along the shore rise steep mountains. The space for landing an invasion expedition near Cagliari is limited mostly to the city itself, the sea approaches to which are covered by batteries. Cagliari is free from malaria at all seasons and would be suitable for a base.

On the west coast is the Gulf of Oristano. There are good landing beaches around the gulf, but these are cut up by several salt lakes with only narrow passages between them. The roads and railroads are in rear of the salt lakes and facilitate the movements of troops of the beach defense. The entrance to the gulf is 10 miles wide. It was not defended at a recent date, but the erection of batteries to cover the entrance should be expected. Due to its wide entrance the gulf is rough when the wind is from the west, and this condition would interfere



with landings. There are no towns and no landing facilities on the shore, although there is a string of small towns (suitable for billeting troops) around the edge of the gulf and from 4 to 7 miles inland. The largest is Oristano, of 10,000 people.

On the northeast coast is the port of Terranova Pausania on a narrow and long bay, very good for medium size vessels. It is

the customary port for communication with the mainland. A valley about 5 miles wide leads into the interior.

Minor ports, which are open and exposed and until recently were not defended, exist at Porto Torres and Alghero on the northwest (with good landing beaches), Bosa (on the west side), and Tortoli, on the east side. Porto Torres and Alghero are on opposite sides of a peninsula which would be pinched off if landings succeeded at these two places. Immediate access would be given to the city of Sassari, second largest in the island, with its 36,000 people. Thereafter an invasion would be confronted with a strong mountain position across the base of the peninsula.

Landings at Bosa or Tortoli are possible in good weather. Communications from Tortoli to the interior are limited to one very steep and winding road, over difficult mountains. There is some open ground around Bosa; an advance inland from here would encounter less difficult ground than at the other ports.

Besides the above there are ports for shipment of mineral ores in bulk at the southwest corner, at Portoscuso and Calasetta. Landings at these ports are indicated as additional to landings at Cagliari and in the Gulf of Oristano, for seizure of the Campidano which (once securely taken) would afford a good base for clearing the remainder of the island.

There are good stone roads throughout the island, many of which are narrow, however. They are suitable for motor traffic. A standard gauge railroad extends from Terranova Pausania through Oristano to Cagliari. Numerous short narrow-gauge lines extend east and west from this main line.

Due to the naval and air bases it is certain that the Axis will make a major effort to retain Sardinia. Prior to this war the Italian war plan for the defense of Sardinia provided for minor forces to protect the military bases, coast and beach guards, and a central reserve. The latter was to be located in the general vicinity of Ozieri, which is a road and railroad center about 40 miles inland and southwest from Terranova Pausania. There are good communications from this area to all parts of the island, and assuming that the enemy has provided ample motor transportation, he could within a few hours bring reinforcements to any place where they were needed. There is considerable cover available in this area for concealment from air observation, and it would be possible to there establish numerous small depots for stores and ammunition. The war plan provided for erection of defensive positions covering each of four possible directions by which an invader might advance toward Ozieri. This would allow the reserve to assume the offensive in one or more directions, maintain a defensive under favorable conditions, and require minimum troops in the other directions.

Due to the development of numerous airfields near Cagliari and in the Campidano, it is probable that a secondary reserve is now stationed somewhere near the center of the Campidano. The enemy is constantly opening new airfields in this area so that if one is placed out of commission another will be immediately available. One of the new centers is based about the ore ports at the southwest corner of the island, the airfield itself being near Carloforte (on an island off the port of Calasetta). It is improbable that the enemy would have located this field on an island unless the latter was defended. The

indications are that new defenses are rapidly going up covering all approaches to the Campidano.

A successful landing within the Gulf of Oristano, cutting the only standard-gauge railroad and the main road from north to south, would hamper the enemy's defense. There is another road from Ozieri to Cagliari but it is much longer, with steep grades and hair-spin curves, and could be interrupted by air attacks. There is no reliable information as to the strength of the enemy's forces normally in Sardinia. La Maddalena has a separate garrison, which besides defending the naval base has batteries covering the Strait of Bonifacio.

#### CORSICA

Corsica, with an area of 3,367 square miles, is 114 miles long from north to south and 52 miles across from west to east at its widest point. It is within 55 miles of the nearest point in Italy, within 100 miles of Genoa, and only 106 miles from France. It has an important value as a defensive cover for the mainland or as a base for offensive operations against Europe. It is separated from Sardinia on the south by the fortified Strait of Bonifacio, which is  $7\frac{1}{2}$  miles wide. The population is about 300,000.

Corsica is almost entirely covered by a chain of granite mountains, heavily wooded. The mountains on the west side descend abruptly into the sea, forming numerous high rock capes and deep bays. On the east side the mountains are more broken down, so there are long stretches of beaches, many separated from the interior by salt lakes and swamps. Due to the mountains the general character of the island is savage. The peaks in the center of the island average between 5,000 and 7,000 feet, but several exceed 8,000 feet in altitude. For nine months of the year snow lies on the center of the chain and the main mountains.

The mountains are generally covered with forests, either primeval or second growth. Their original growth includes chestnuts and olives, which grow wild. The second growth is known as the *maquis* and consists of unusually dense clusters of myrtle, arbutus, and similar fragrant plants interspersed with thorn bushes and growing to a height of six feet. The bloom and perfume of the *maquis* attracts tourists on account of its beauty, but it forms an important military obstacle and conceals defensive installations from both air and terrestrial observation.

Rivers are short, but at times they bring down large volumes of water and may become a military obstacle. The most important are the Golo and the Tavignano, respectively at the north-center and center of the east coast. Other streams are comparatively small.

As the island does not produce enough food for its own use, this must be allowed for in case of invasion. Some wheat is grown, and lemons, olives, grapes, and similar citrates are raised, mainly in the northwest corner. Tobacco is produced in small quantities. The lack of food production is due in part to indolence on the part of the inhabitants and partly to the fact that, although the majority of families own farm land, it is split into widely separated sections. The same individual may have an orchard near the coast, a farm miles inland, and a forest plantation up in the mountains. A large amount of time is wasted in traveling to and from these places.

There is a sizable lumber industry. A restricted amount of anthracite coal, copper, and antimony is produced. On the whole the economic value of the island is not great.

The inhabitants are of Italian origin and speak an Italian dialect, but French is commonly spoken. Hospitality and friendliness to strangers are characteristic. The people are divided into clans which have preserved their own language, dress, and customs. These clans are not friendly to each other, and feuds between them are common. Corsicans habitually carry arms. They usually avoid dealing with the constituted authorities. When grievances exist the tendency is to settle scores personally. In case of invasion attention should be given to not mixing labor and other gangs coming from different clans.

In general the people are unenterprising. The country being very hilly, walking is avoided, the usual means of travel being by mule or donkey. The poverty of the country and its inability to raise its own food are largely due to native indolence.

Capital of the island is Ajaccio, a city of some 23,000 people. It is located in the southwest, on the north side of a magnificent gulf of the same name. There is a good harbor, but it lacks wharves—there is only one suitable for transports. There are good beaches at the city itself and at frequent intervals around the gulf. It would be entirely practicable to land personnel and material from lighters and barges, there being a good shore road all along the north coast, the head of the gulf, and part of the south side. The best landing beaches are at the city and at the head of the gulf, about the mouths of the Gravonne and Prunelli Rivers (two small but turbulent mountain streams). Notwithstanding its situation there is no regular ocean-borne traffic at Ajaccio, the city being primarily a winter resort, with excellent hotels convertible into hospitals or administration buildings if captured before destruction.

On the north side of the gulf there is a shore road 14 kilometers long, extending to Cape de la Parata at the north entrance to the gulf. Parallel to this shore and 2 miles inland is a valley with another road. Between the shore and the valley are hills 1,500 feet high, covered with *maquis* or trees. On the north side of the valley are other hills which rise 2,000 feet within a mile. Because this is a winter resort area there are trails along the summits of these hills leading to Ajaccio. It must therefore be presumed that the enemy, now in possession of Corsica, has utilized the valley as a covered way to the trails to the tops of the hills, to install there not only OPs overlooking the water approaches but batteries as well. There is sufficient flat ground on mountain tops to install several batteries without requiring extensive emplacement work.

Any landing on the north side of the Gulf will at once meet exceedingly steep slopes, with concealed enemy positions. With the valley and the trails the enemy has at least two concealed routes parallel to this coast along which he can move his forces in a lateral direction. The situation is similar on the south side of the gulf, except that the hills do not exceed 1,200 feet in altitude within a mile of the shore. The shore road extends only about halfway to the entrance cape on this side, but the enemy would have summit trails clear to the end.

Any attack on the Gulf of Ajaccio is sure to meet strong

opposition from hostile positions on the hills. As the tops of the hills are narrow and have much cover, parachute attacks might be effective.

North of Ajaccio is the Gulf of Sagone, with a small port of the same name at the northeast corner and another one (Liscia) at the southeast corner. These two places are 10 kilometers apart and connected by a good shore road along which it would be practicable to land. This gulf is exposed to bad weather from the west, which would interfere with landings. The shore road is generally separated from the beach by dunes which would make good positions for machine guns and infantry mortars. High hills with steep slopes surround the gulf. The shore road continues 14 kilometers beyond Sagone to Cargese. This section lies close to the mountains, here covered with grape vines, olive groves, and orchards.

North of Cargese and also south of Liscia, the road turns inland and ascends steep grades leading to the next gulf on the north and to Ajaccio on the south. This is a good motor road but can easily be so blocked by bombing as to prevent the arrival of enemy reinforcements.

From Sagone a good road leads into the interior for about 15 miles, after which trails lead across the mountain range. There are no important objectives on this road.

The next gulf to the north is Porto, with a small town of the same name in its southeast corner. This lumber shipping port is suitable for a minor landing. Beaches are restricted, and there is no stretch of shore road near the sea. A difficult trail leads into the interior.

Omitting some minor gulfs, the next important ones (continuing along around the island in a clockwise direction) are at Calvi and at Ile Rousse, on the north side. These two towns, each of about 2,000 people, have small ports. They are 13 miles apart and connected by a good road which is partly along the sea and partly up on the mountainside. It would be practicable to land on this coast, from which two good roads lead into the interior, although both are steep and winding and with many excellent positions for defense. These two ports would, if held by us, be useful as bases against the south coast of France, as they afford the shortest round-trip distances for transports and have good communications between them.

Last along the north coast is the Gulf of St. Florent, with a town of the same name at its head. This is a very small port, with good roads leading east, west, and south. It would be advisable to seize this place as a supplementary operation in connection with the reduction of Bastia, considered in next paragraph; otherwise it is not of special value.

Starting down the east coast of Corsica from the north, we first come to Bastia. This city has 28,000 people and the best port in Corsica. It is believed to be the enemy's main supply head. Supplies coming from Livorno (Leghorn) (only 64 miles away) and from Genoa (about 100 miles) require 4½ and 6½ hours in ordinary times for a one-way trip. Bastia is the rail- and roadhead from the sea into the interior. Both the railroad and the road follow up a narrow canyon affording numerous suitable defense positions.

North of Bastia the mountains are so close to the coast and so steep as to make the shore unsuited for landings. South of Bastia, beaches extend for 3 miles. Thereafter there are 9 more miles of beach to the Golo River, which is not fordable at its mouth. Back

of the beach this stretch has salt lakes up to 1½ miles wide. Continuing south, beaches extend for 6 miles, when the mountains again close in to near the sea. Further south where the Tavignano River empties into the sea is the village of Aleria. A good road extends from here into the interior, but the beaches in this vicinity are generally bordered by swamps and lakes between which only narrow passages are available to an invader.

Near the southeast corner of Corsica is the Gulf of Porto Vecchio. This is a very good port, but like the other gulfs it is surrounded by high hills.

Still further south is the Gulf of Santa Manza. There is no objective directly on this gulf, but if the fortifications of the Strait of Bonifacio are to be reduced, a landing on this gulf would be logical for it would take the Bonifacio position in reverse. As this gulf is but 8 miles from Bonifacio, it may by this time be included within the perimeter of the defenses of the strait.

At the extreme south is Bonifacio, a small and picturesque port of 4,000 people, widely known for its lack of cleanliness. An attack on this port would be necessary to open the strait. Outside of this it has no importance. It is located at the end of a small peninsula, very exposed to gun fire.

The main railroad extends from Bastia southwest to Ajaccio. Branches lead off to Ile Rousse and Calvi (on the northwest coast) and along the east coast southward for about half its length. Motor roads parallel the railroad. A motor road follows the shore entirely around the island, although it is usually some distance inland.

Along the railroad, commencing at Ponte Leccia (16 miles from Bastia) and thence 17 miles south to Corte, is the upper valley of the Golo River, with high mountains on all sides. This is the road and railroad center of Corsica, and the most probable place for the enemy's main force. From this area any part of the island can be reached within a few hours. Direct air service is available to Italy and France.

The Axis occupation of Corsica only dates from the middle of November, 1942. Little is known of what steps have been taken to defend the island. As Corsica would be an excellent base for the United Nations for an invasion of south France or the northern part of the west coast of Italy, it is probable that the restricted number of suitable landing beaches have been prepared for defense and that a garrison of several divisions has been sent to the island. On account of the terrain, Italian Alpini Divisions can be expected to be present.

Airfields are known to have been located near Ajaccio and Bastia. These have probably been extended, as until now there has been no demand for large military air fields. New fields have undoubtedly been constructed. Bases for sea planes can be improvised in all the numerous gulfs.

In an attack on Corsica opposition would be met from air forces based in Italy, there being numerous large fields within 100 to 150 miles. The great Italian naval base at Spezia, from which submarines and motor torpedo boats operate, is within 100 miles of the east coast. A landing on this side of the island would be opposed from these points. As there are few suitable places for landing on the east side, with only restricted and difficult routes into the interior, it would seem easier to attack on the west side.

Assuming that the enemy is watching and defending all the numerous gulfs on the west, best chances of success would result from attacking all simultaneously. After establishing beach heads, an advance into the interior, gradually clearing

the island, would follow. Such a campaign would entail hard fighting, as the terrain favors the defense.

#### THE BALEARIC ISLANDS

No consideration of the western Mediterranean is complete without discussion of these islands, although at this time they are in neutral hands. Their importance rests upon their situation, and upon unusually fine harbors and air bases.

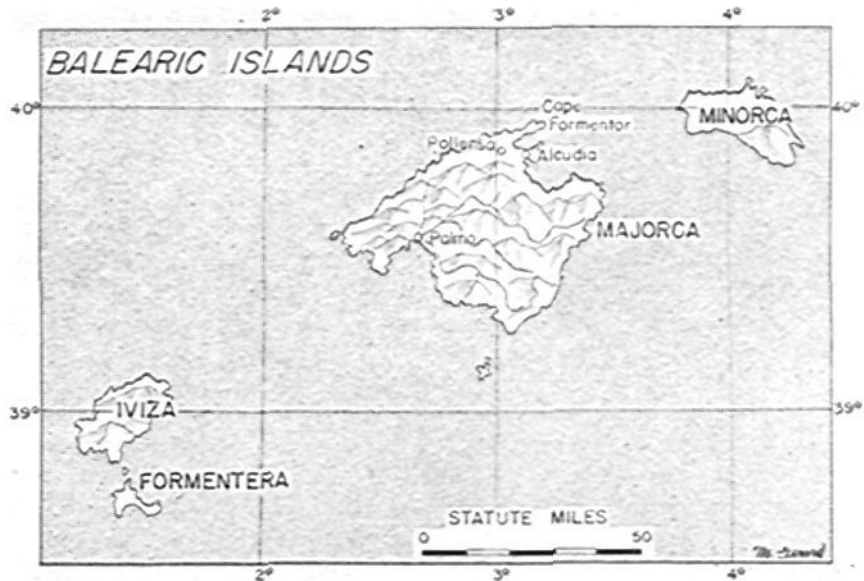
The islands are divided into an east and west group, arranged on a southwest-northeast line. They vary from 55 to 140 miles from Spain and are about 200 miles south of France and north from Africa. To Sardinia it is about 220 miles. The east group is the more important and consists of two main islands (Majorca and Minorca) and 7 islets. The west group consists of Iviza and Formentera, and 4 islets.

*Minorca* is the most easterly of the islands; it contains what is reputed to be the finest harbor in the western Mediterranean, and is suitable for a first class naval base. It was the British naval base in this area during the century preceding the Napoleonic wars.

This island has an area of 260 square miles, and a population of 375,000. The country is rolling, with a maximum altitude of 1,200 feet. Water supply is not ample.

*Majorca* (about 20 miles southwest from Minorca) is the largest island, having 430 square miles and a population of 250,000. Of irregular shape, it approaches 45 miles in both length and in breadth. The northwest end is mountainous, with summits exceeding 5,000 feet. The remainder of the island is low and sloping. There are 12 harbors, and numerous other places where landings could be made. The most important bay is Palma; at its head is a city of the same name, with a population of 64,000. Next best harbors are two on the northeast side, about 8 miles apart—Alcudia and Pollensa, towns of about 8,000 people each.

The island is densely cultivated. There is a distinct lack of water. Autumns and winters are rainy, but there is next to no rain in spring and summer. Rainwater collected in cisterns is normally sufficient to last the local inhabitants throughout the dry season. This would not suffice if a considerable number of troops moved in. There is quite a bit of livestock, the cows being unusually small and the sheep unusually large.



*Iviza* (228 square miles, population 24,000) is about 50 miles southwest of Majorca and 60 miles east of the Spanish mainland. It is hilly, with a maximum elevation of 1,560 feet. It is highly cultivated. There is only one town worth mentioning. It also is called Iviza, lies on the southeast coast, and has 2,250 people and a good harbor.

*Formentera* is just off the south end of Iviza, and can be considered as part of it.

All the foregoing islands have air fields, and more could be constructed. There is ample ground for assembling troops and supplies, and the best of ports. They are within convenient distance of the south European coast.

#### COMMENTS

The western Mediterranean islands are of great tactical importance for an invasion of south Europe. They will materially aid whichever combatant has them. Their distance from each other, in no case exceeding 220 miles, makes them within easy air supporting distance. They also afford good bases for light naval forces.

Sicily, Sardinia, and Corsica are essentially mountainous, affording advantages to the defense through their restricted number of possible landing places and difficult terrain. Their relative ease of capture is probably in the order named. They may be attacked simultaneously. The fall of any one will facilitate the fall of the others.

**The capture of these three islands would seem to be requisite before an invasion of the mainland can be undertaken. If the Balearic Islands remain neutral, their use by the United Nations is not essential. For an invasion of southwest France their possession would be an asset.**

Last year the Association adopted V-mail as its exclusive means of writing our members overseas. Even expiration notices and statements are sent in this manner. This is but one part of our policy of giving every possible service to our members in remote places.

Letters like the following one from 'way "down under" attest the effectiveness of this policy:

"Herewith my money order for next year's dues. Congratulations on your V-mail reminder; there is a good chance I'll be paid up in time from now on. Also, your service is very good—even to down here!"

So—if your JOURNAL has not been reaching you as you'd like, the chances are we are still mailing it to an outmoded address. In case of any doubt in your mind, why not drop us a line and let us know your current address?



# Let Well Enough Alone!

By Lt. Harold G. Miller, FA

Axis strategists have capitalized on American habits, inquisitiveness, and carelessness in bringing into play the trickery which characterizes the booby trap. The enemy has

Proper conduct on the battlefield as regards booby traps is nothing more than self-discipline. The Italians have taken advantage of a number of mistakes, in "planting" thermos bottles to entice the thirsty pursuer. These bottles are usually placed upright, to invite the curiosity of the fatigued American. And it is unfortunate that the trick was frequently discovered with the death penalty.

The Germans have capitalized on the souvenir mania of their opponents. German field glasses are a find on the battlefield, and a valuable aid in observation. Knowing this, the Nazis have wired great numbers of these instruments in their flight.

Sill's Replacement Center course is designed to bring recruits the latest developments in the battle of booby traps. Information is brought first-hand by military observers from the scenes of action, and by news and military reports. Trainees will go front-ward with a booby trap background that will put them on notice of much of the trickery of the adversary.

In setting up the course, the Replacement Center has kept in mind that it is dealing with artillerymen. Those traps that get through the network of infantrymen will be well concealed. Therefore the burden is greater on the artilleryman in detecting these traps. Knowing that other troops have gone before, he tends toward carelessness — a fact which is being stressed in the elementary training of the new soldier.

The best advice brought back from the front by the observers is: "LEAVE EVERYTHING ALONE!" Yet, in the heat of battle soldiers will dive into a vacated enemy foxhole,



*Be ever on the alert for strings or wires. Here soldiers approaching a seemingly abandoned house set off a land mine by tripping over an innocent looking string.*

considered all the angles of this weapon—the morale factor, surprise element, and, of course, the casualty list. During the Rommel retreat British and American troops fought a terrific wall of dynamite in their pursuit of the "desert fox"; land mines and booby traps kept the Allied forces from out-running the Germans, and permitted the Axis forces to slip over Mareth Line with most of their equipment and personnel intact.

To give the new military men a glimpse of the working mechanism of booby traps and to show the effect of carelessness and inquisitiveness, the FARTC of Fort Sill is incorporating a new booby trap course into its extensive training program. This course of necessity is short, but it is designed to bring to the trainees the latest word in enemy traps and will give them a ringside seat to the performance they are expected to see repeated on the battlefield where the stakes are for keeps.

Training authorities are well aware that battlefield instruction is longest remembered. But they are warning their soldiers that with booby traps a soldier makes only one mistake. The results are similar to those of the parachute jumper who cannot locate the ripcord.



*Watch where you step! Often a footstep will prove fatal. In this photo a soldier set off a well hidden explosive by stepping on a loose stone.*



plunge under a forsaken truck or tank, race over mined areas, or seek shelter in an abandoned dwelling or outhouse. Hence the American soldier is being taught the precautions to take in each of these cases. On the front he will have a respect for them—a fear which will be the best life-assurance in the world.

Unusual traps, designed to take advantage of a man's natural



*Never be over-anxious to pick up or move articles left by the enemy. Here is shown a typical example of how easily field glasses can be wired so that any slight movement will set off powerful and fatal explosives.*

and instinctive acts, have proved most successful to date. The Germans have loaded a whistle so that when the vibrating pea strikes a tripper it blows up in the victim's face. Earphones and telephone sets are loaded, and explode upon turning a single screw.

A new-type radio is known to be wired for booby trap purposes at the factory so that when it is abandoned it can be connected and left on the field to destroy the American salvage crews.

The Japanese have resorted to such small gadgets as fountain pens, wallets, and field glasses (which aren't much good anyway). They have "poisoned" both the American and Jap dead with traps so that when the litter-bearers moved the



*Here is shown one of the many simple but effective tripping devices used in completing the electrical circuit which is necessary in setting off the death trap. A flimsy wire protrudes in the middle of the copper loop; slight tension on the string connects the wires, giving "juice" to the detonating cap from the battery.*

bodies there were, effective immediately, several more bodies to be moved.

Motor mechanics and salvage experts who have endeavored to put abandoned materiel into working order have found no end of ideas in wiring trucks and tanks. Hoods have been so trip-wired that when contact is made the machine and its salvage crew are sent skyward with the regulation equipment for angels. Ignition switches, starters, carburetors, and seats have all been "poisoned."

There will be new traps and anti-personnel mines brought into play before this war is over. But our soldiers are becoming more alert to the chicanery of the adversary; through their Replacement Center training they are using information obtained by the supreme sacrifice of many of their less-informed buddies on the battlefield.

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#### BATTLE CASUALTIES — THEN WHAT?

Officers as well as men get killed or wounded. Leaders as well as the led become casualties. Non-coms may have to take over entire units. What are you doing to prepare them for these responsibilities?

Recently one field artillery battalion, the 959th, was placed entirely in the hands of its non-coms for an entire day. Officers were merely observers. The program? All administrative work, of course, plus a tactical problem and service practice. All types of firing were conducted—axial, small-T, large-T, forward observation, etc. Efficiency? So high that the enlisted men were commended for their work by Brig. Gen. Ralph Hospital, who was an eye-witness to the whole affair.

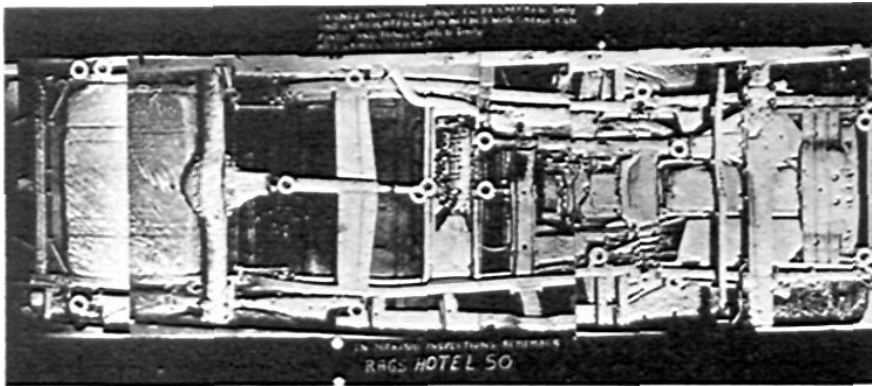
*No unit is ready for combat until it has non-coms who can temporarily fill officer positions.*

# PHOTO LUBRICATION CHARTS

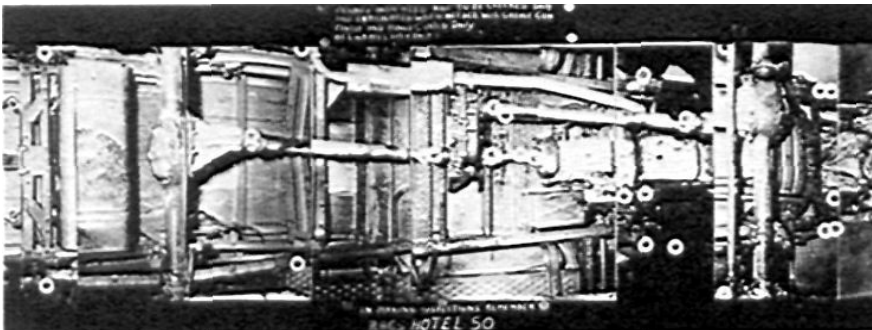
By Lt. Melvin L. Hart, FA



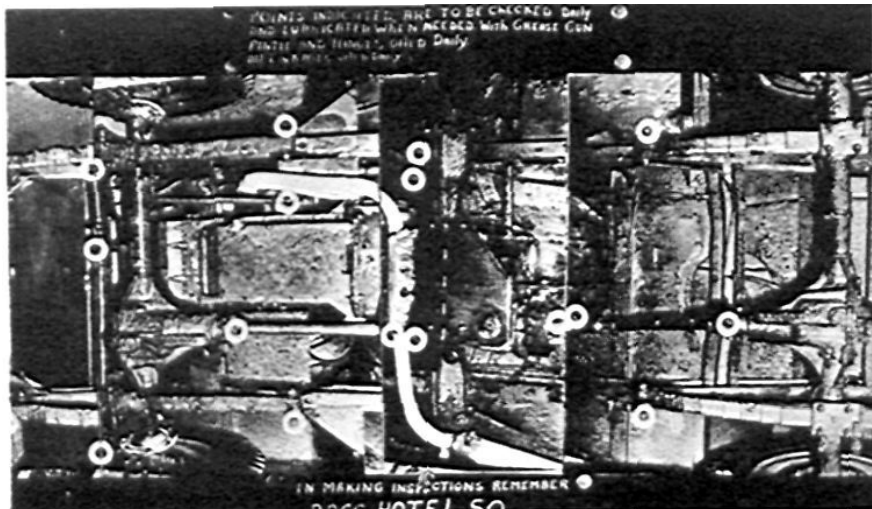
G.M.C. 2 1/2-ton 6x6



Dodge 3/4-ton 4x4



Dodge 1/2-ton 4x4, with winch



1/4-ton 4x4

Photo lubrication charts, providing the army driver with an actual picture of the underside of his vehicle and plainly designating the points to be checked and lubricated, are used by our divisional artillery. They have not only given the drivers a chart that is in many ways superior to the oft-times confusing diagram, but have also proved most satisfactory in the instruction of new drivers who are being initiated in all-important duties of preventive maintenance.

These charts were made with the photographic equipment that is part of any Signal Corps unit. To prevent any distortion in the finished print several shots were taken, pieced together in a strip mosaic, and then rephotographed.

To provide the necessary elevation, the vehicle was driven onto a wooden grease ramp. The photographer lay on his back and held the camera in one position while the vehicle was moved a short distance between the successive shots. On the first trial the photographer shifted his position for each shot, but it was found upon developing the film that the focus varied so much that the prints would not fit together properly.

After the photographs were pieced together in a strip mosaic, gummed paper reinforcement rings (note-book type) were pasted over the lubrication points and the mosaic was rephotographed. Finished mosaics were mounted on ply board and covered with cellophane to keep them clean.

Development of the photo lubrication chart was prompted by a shortage of factory diagrams when the driver instruction program in our battalion was getting well under way. After putting the photo charts into use, however, they were used in preference to the diagram even when the latter became available. It was found that the photo lubrication charts were particularly effective in teaching the drivers nomenclature, because a driver could have the various parts named to him on the photograph and then take the chart under the truck with him and compare the part on the photograph with the part he saw. Because the student driver had a chart that showed the details exactly as they appear, the chances of confusion were reduced to a minimum.

On our charts appear the code words RAGS HOTEL SO, which have become the byword for our preventive maintenance. The letters of the code words suggest the operations for the inspection of all vehicles before starting the motors: Radiator, Axles and linkage, Gasoline, Surface under vehicle (for leaks), Horns and lights, Oil, Tires, Engine (loose wires and parts), Loads (condition and distribution), Spare parts, Overheating (brake bands and hubs). The Overheating of course applies only during halts during a march.

In addition, the word FEDAM is used for the inspection of motors *after* starting as follows: Fan and fan belt, Engine, Dashboard instruments, Action of controls, Move vehicle (clutch, transmission, steering, and brakes).

# Seventy-Sixth Field Artillery Song

By EDITH H. WARD

Moderato

1. As we're go-ing down the road, the  
2. It was east of Châ-teau-Thier-ry and in  
3. You can hear our guns a - rum-bling as we

in - fan - try we hail, And it's greet-ings to the gal - lant cav - al - ry. With  
front of Mont-Saint-Pierre When our men re-ceived their first real test of war. But they  
drill through-out the day, You can hear - our men join in glad re - frain, As in

you've glad-ly fought, But the ser - vice we have sought, With the rum-bling guns of Field Ar - till - er -  
car-ried on and through. As our men will al-ways do, And the guns kept up their shell-fire near and  
bar-racks clean we rest, While a breeze from out the west Blows the bu - gle calls at eve-ning cross the

**CHORUS**

y. far. plain. Roll them a - long, men, Wheel, lead, and swing, Tight are the trac - es, Fear not a thing. We're

all in the har - ness! Our pride is that we Are the Sev - en-ty-Sixth Field Ar - till - er - y.

# RICOCHET FIRE-INTERIM REPORT

By Lt. Col. J. H. Bertman, FA

Additional data on ricochet fire have just become available, adding to the material recently set forth by Maj. John S. Hughes in his *Practical Application of Ricochet Fire*, page 345 of the JOURNAL for May, 1943.

## FUZES AND RANGES

Earlier experiments used fuzes having maximum delay action of .15 second. More recent tests with a .25-second delay fuze indicate ricochet fire may have a much wider application than heretofore. Practically 100% ricochets were obtained with this fuze with an angle of impact up to 520  $\mu$ , and some ricochet bursts resulted even at 576  $\mu$ .

What these angles mean in terms of range is indicated in Table A. This table assumes that the slope of ground is zero, but *this refers only to the shape of the major ground formation*. The *general* slope of the ground does of course influence the course of a projectile after impact. *Minor* irregularities, on the other hand, have practically no effect. A flat impact area is *not* a prerequisite for ricochet effect—a fair number of test rounds were recently fired into rugged, pitted, cut-up, cratered ground, and the ricochet percentages were substantially the same as those obtained on a more "controlled" surface.

This suggests, then, that considerably more than mere angle of actual impact is involved in obtaining ricochet bursts. There are a number of other factors, and character of ground surface is perhaps the most obvious one: a swamp should give fewer ricochets than hard-pan.

## RICOCHET VERSUS TIME FIRE

Against personnel (especially when entrenched) air bursts are greatly superior to impact bursts. There is no conflict between ricochets and time fire—each gives the desirable air burst, and under differing circumstances one or the other may be preferable. The important thing is to know the advantages and limitations of each, and how to handle both, so that best results can be had.

Time fuzes have definitely limited ranges. Ricochet fire is uniformly effective at any range from minimum to the maximum range of the weapon, provided the ricochet effect can be had.

Height of burst is difficult to adjust with time shell, and is subject to its own probable error. Ricochet fire is as easy to adjust as is percussion fire, and in general a given fuze at a given range yields a quite uniform height of burst.

This matter of burst height is of great importance. The higher the burst, roughly the wider the area covered by fragments—but this is not the proper

Charge	Ranges with angle of impact of	
	520 mils (Tan. 1/1.78)	576 mils (Tan. 1/1.57)
1	3200 yds.	3400 yds.
2	3700 "	4000 "
3	4000 "	4600 "
4	5300 "	5600 "
5	6800 "	7200 "
6	8000 "	8500 "
7	9200 "	9800 "

Table A

	No. of Entrenched Targets Hit		
	No. Rounds Fired	at 3000 yds.	at 7200 yds.
Time	10	95	64
Ricochet	10	103	93

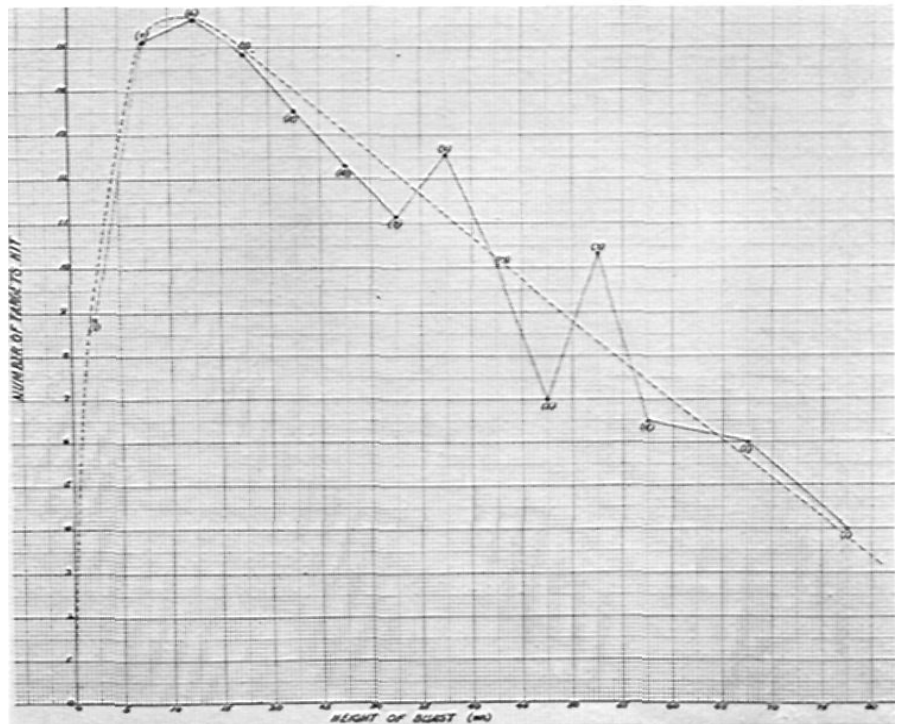
Table B

	No. Rds. Fired	Targets Hit with 11' Height of Burst	
		Standing	Prone
Super quick	10	88	50.2
Ricochet	10	95	73

Table C

Figure 1

Time fire: number of entrenched targets hit, compared with height of burst. Number of rounds considered at each point on curve are indicated.



criterion, as the smaller fragments quickly lose velocity and of course the higher the burst the more thinly these particles are spread over their larger area. It is important that the mean height of burst be kept at 15 yards (see Figures 1 and 2).

At shorter and mid-ranges, both ricochet and time fire appear to be about equally effective, provided the time fire is accurately adjusted for height of burst. At longer ranges, however, ricochet fire is 50% more effective (see Table B).

#### RICOCHET VERSUS PERCUSSION FIRE

Superquick fuzes have long been standard for fire against personnel in the open. Against targets in the open superquick bursts compare favorably with low air bursts, which in turn are much more effective than high air bursts. Even here, though, ricochet bursts have proved their superiority, as Table C demonstrates. These ricochets were fired with an average burst height of 11 feet, which has proved to be the most effective height against exposed targets.

#### SUMMARY

Air bursts are more effective against personnel than are percussion bursts.

Ricochets are more effective than time fire.

Adjustment of ricochet fire is easier than that of time fire.

Ricochet effect can be had under previously unappreciated conditions: at larger angles of impact, at

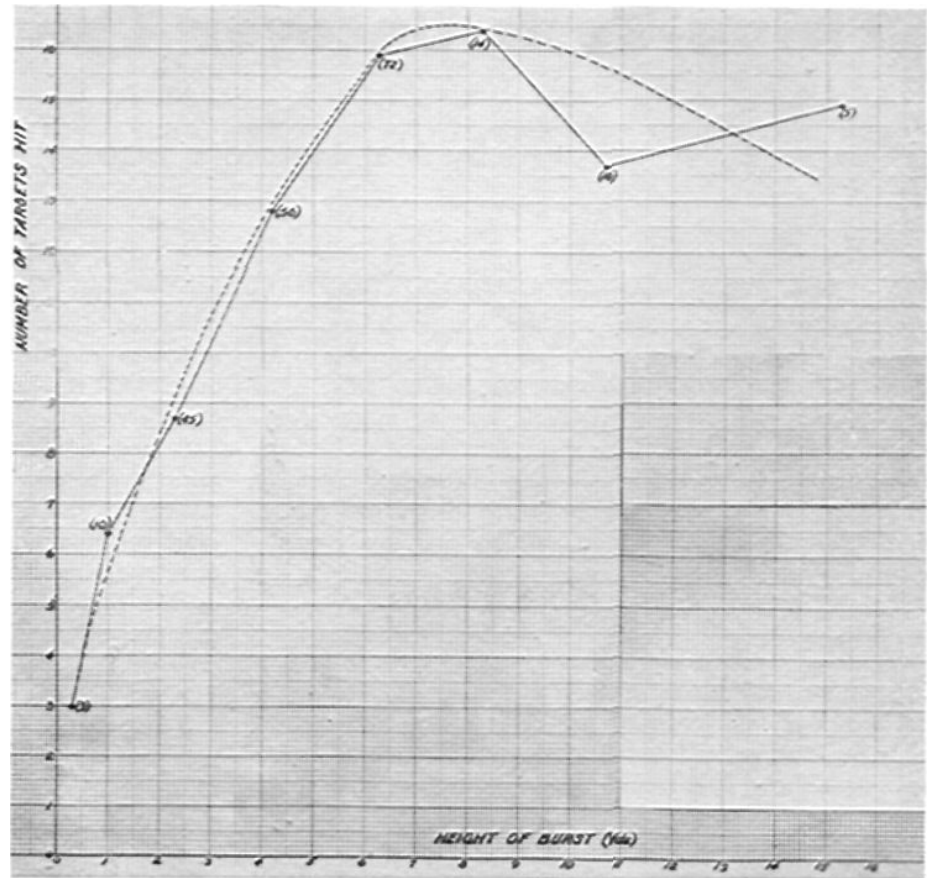


Figure 2

Ricochet fire: number of targets hit, compared with height of burst. This is a compilation of 221 rounds fired with modified PD M48 fuzes. Number of rounds considered at each point on curve are indicated.

greater ranges, and on more broken terrain.

Ricochet fire must be studied, understood, and used whenever possible.

#### TRAINING FILMS

Are you making good use of available visual aids? Here are some recently-released training films of special interest to artillerymen:

- |  |   |
|--|---|
| 1-3302—Recognition of the Japanese Zero Fighter  | 10-1134—Same—Part II—Cutting a Hindquarter of Beef    |
| 1-3303—Identification of the Japanese Zero Fighter   | 10-1135—Same—Part III—Cutting a Forequarter of Beef   |
| 4-1139—Caliber .50 Antiaircraft Machine gun, Part I—Disassembly and Assembly of Gun, Handling Ammunition | 10-1136—Same—Part IV—Cutting Lamb                     |
| 4-1156—Same, Part II—Care, Maintenance, and Emplacement  | 10-1137—Same—Part V—Cutting Veal and Pork             |
| 10-1089—Motorcycle Driver Training—Part II—Basic Driving   | 12-1157—Visual Classification Test—Silent             |
| 10-1104—The M1937 Field Range — Part I — Range Equipment and the Fire Unit                               | 12-1158—Visual Classification Test—Sound              |
| 10-1105—Same—Part II—Cleaning and Maintenance  | 18-1115—Tank Destroyer—Selection of Positions         |
| 10-1133—The Army Cook — Part I — Meat Cutting Tools and Equipment  | 18-1116—Employment of Secondary Weapons Against Tanks |
|  | 21-1007—Snafu   |
|  | 21-1019—Crack That Tank                               |
|  | 31-1143—Individual Training in Ship-to-Shore Movement |
|  | 629-1027—Hand-to-Hand Combat                          |

# Firing Tests Uncover The "Whammies"

By Maj. Harold E. Bisbort, FA

Artillery is a science. Artillery fire can be accurate if the necessary surveys are accurate and the "whammies" are eliminated. "Whammies\*" are strictly "snafu"—comparable to Air Force "Gremlins," they concentrate on artillery only. Any artillery unit that seeks a creditable showing in the Army Ground Force Battalion Tests must eliminate these "whammies" at their source. The following will cover the amount of survey that is usually necessary for the three battalion tests, and show many causes for inaccurate fire that have been uncovered in conducting these tests.

## TEST I

This test, conducted by battalion, stresses speed in occupying positions and delivering observed fire on targets of doubtful locations. An observed fire chart is constructed from three registrations, and battalion concentrations are fired from it using adjusted data from bracket adjustments. Since each battery registers, pieces are laid for direction more accurately than is possible by survey.

Survey personnel can be used initially as markers, guides, or in any other capacity to assist a rapid occupation of position. After the battalion occupies position this personnel (as good training practice but not as part of this test) could start laying out an orienting line, tying in the batteries from place marks, and generally working toward a complete survey. Survey should always be progressive, and taking steps to replace the observed fire chart with a surveyed chart is good procedure.

The observed fire chart must be *accurate*. Too often there are errors in adjusted data on which the plotting is based. Erroneous laying has resulted because aiming circles were not properly declinated or were set up so close to masses of metal that they suffered from local attraction—guns have been laid by aiming circles only 20 yards away, near trucks and ammunition, or near the side-arms and helmets of their operators. It is preferable to lay by compass initially, then apply corrections: the adjusted compass is often measured in haste, resulting in queer results. Other sources of error are poor adjustments, and improper use or care of the fire chart, which should be kept neat, with clear indexes, so that accurate data can be prepared from rapid readings.

On bracket adjustments preceding battalion concentrations, speed should not be lost through FDC, getting commands from OPs through FDC to the guns. These bracket adjustments must be *good* adjustments; it may sometimes be desirable to see a salvo at the center range.

Among other causes of *inaccurate* fire have been guns emplaced with considerable cant; ammunition exposed to heat, moisture, and dirt; aiming stakes placed too close; aiming points too close; sights not checked in the field; residue left in

bore of pieces; guns laid with sight extension bars; pieces not calibrated, showing excessive variation between rounds; errors in transmitting firing data over the means of communication; bubbles not consistently checked for level; and poor checking of deflections by the recorder.

Among observed causes for *delays* in fire were slow adjustments due to poor initial data; poor judgment, creeping, and missensings during adjustments; slow FDC procedure; poor radio communications; congestion of radio nets (caused by unnecessary messages); failure of pieces to come into position in their proper order; lack of guides and markers; poor distribution of ammunition; displacement of guns because of positions on slopes; and one officer performing all the work at FDC.

Time required for completion of this test will vary because it depends on a number of conditions, such as the location of OPs with respect to gun positions, distances between batteries, road conditions and traffic, weather, and the length of communication lines.

The battalion commander should be sure he has a good idea of where battery position areas and OPs are, so that officers firing the adjustments can have some basis for at least estimating their initial data. "Time" starts when the two targets and base point are identified on the ground. Acknowledgment of the identification of these targets should not be made until all possible information is obtained, as this test counts 60% of the combined scoring for the three tests. Failure in Test I will make extremely weak the battalion's chances for a net passing grade. Thus the battalion commander should strive toward *accuracy of fire*, and maintain a constant surveillance throughout the test.

## TEST II

Also conducted by battalion, this test stresses rapid occupation of position, and quick surprise fire on targets by K-transfer using a photomap as a firing chart.

The first job for the battalion commander is the selection of a base point. Two targets are pointed out on the ground and two other targets are shown located on the photomap. By orienting the photomap and approximately picking the ground locations of the two targets shown on the photomap, a suitable base point can be selected. A good, clear, outstanding base point should be selected so it can be easily identified. For example, a stump should not be selected as a base point when it is in a field of a dozen other stumps.

Survey in this test consists mainly of two jobs—the target area and position area surveys. The target area survey work includes the location of the base point and two observed targets both horizontally and vertically, with respect to a selected known initial point. In addition, one or more critical points may need to be located in the general vicinity of the two targets

\*Acknowledgment is made to Yank magazine as originators of the Field Artillery "Whammies."



that are shown on the photomap, in order to interpret vertical control; these critical points can usually be selected by inspection.

Position area survey includes the installation of an orienting line, if one is used for laying the battalion for direction, and location of the batteries by inspection or short traverse. Altitudes (or at least relative altitudes) of the battery positions must also be determined.

It is good practice to have the battalion survey parties so organized that they are divided into three groups: target area, position area, and connecting area groups. In this case one party runs the target area survey, one lays out the orienting line (if it is used for laying the battalion), and the other locates the battery positions and determines their altitudes or relative altitudes. A central point, preferably near the FDC, should be designated for the rapid consolidation of all survey work.

#### *Target Area Survey*

The first method available for location of targets is inspection. This is generally not possible because of the targets' locations and the area covered by the photomap, so the data must generally be obtained by long- or short-base intersection methods.

Long-base intersection is a location by graphical intersections, requiring the plotting of two known points separated by a distance great enough to give an intersection of at least 500 $\text{m}$  at the target location. No computations are necessary. Disadvantages are the distances necessary between the two known points, difficulty in occupying two known points and still having communication between them, and the trouble in target identification from both points. Many observed poor effects were caused by wrong target identification.

Short-base work requires only that one end of the base be located on the chart, as only the direction is plotted graphically. Distances to targets located by this method are computed by solving right or oblique triangles. The angle of intersections for accurate results should be approximately 100 $\text{m}$  if a transit is used, and approximately 150 $\text{m}$  if the aiming circle is used. If this angular standard is maintained stadia can be used for measuring distances if it is faster—but the readings must be accurate and read at least twice. Errors in reading direction are the greatest causes for poor effects because they increase with the distance. Direction must always be precise, with angular measurements always read at least twice accumulatively. Advantages of short-base intersection are the easy communication between the two points, ready identification of targets, and ease of control of the personnel. Computations should always be made by two men, for verification.

The above base length standards can be shortened if there is greater accuracy in reading the angles (more accumulative angles) and in measuring the length of the base. If tactical conditions prevent measuring the base length directly, then "short-base" this length to determine its measurement.

Whichever of the three methods is used for the target locations, angles of site must be read to the base point, to the two observed targets, and to any critical points, from the initial known point using an assumed initial altitude. The critical points can be located by inspection and map ranges used for computing their elevations.

Locations of the base point and the two targets should be verified by inspection or intersection, depending on whichever

method was used originally. On numerous occasions large errors of mislocations could have been picked up by proper verification. Considerable delay will be overcome if communications are arranged so the target area group can send its information to the central point as soon as it has been verified.

#### *Position Area Survey*

In laying the battalion for direction four methods may be used, depending on the situation.

1. Orienting line is used for direction. As one registration is permitted, this line can be *any* direction and need not be tied into any known direction. It can be one straight line (which is preferable), or a line with one or two offsets, but never try to select an orienting line except when in the position area.

Usually the line can be best selected by going to the center battery; sometimes the highest ground in the position area is the best place from which to select the line, but by observing the battery locations, the best orienting line can be selected. Remember that a simple orienting line that allows place marks from 50 to 400 yards from the guns will be satisfactory. If the distance is too great for the executive to be heard from it, he can use a messenger to relay commands.

Many survey errors have resulted from survey officers' persisting in laying our parallel orienting lines. Remember, *direction must always be precise*. The more angles that are turned, the more chance for errors. If one straight line cannot be made to hit at least 50 yards from one gun in a battery then perhaps one offset will suffice, and the old n-2 straight-angle formula can be used for getting the remaining base angles after the adjustment. Another method is to determine the base angles for each battery prior to the adjustment by comparing the measured azimuth of the base line with the computed azimuth of the orienting line, then laying each battery accordingly; corrections found by the adjusting battery can be applied to the others.

Ends of the orienting line should be marked distinctly. An SOP colored stake for direction markers on the orienting line is a good idea; it could well have a movable target disc on it. All direction markers should be placed a good distance away—around 100 yards, at least. Poor laying has been caused by trying to use crooked tree branches, wide and odd-shaped boards, and markers too close to the instrument stakes.

Poor instrument stakes cause errors, too. These stakes should be small and narrow, tagged, and well marked with slanted distinctive reference stakes. Battery executives must be shown where these stakes are. Remember in staking out an orienting line that *direction must always be precise*. A good check on laying with base angles is to have each battery report its measured compass. This catches errors *before* firing.

2. One aiming circle, from one position, may be used to lay all the batteries—if they are close enough. If guns cannot be laid directly, then other aiming circles could be laid reciprocally.

3. A single aiming circle can be taken to each battery to lay each in turn—being certain that all metal is a sufficient distance away. This is used sometimes when batteries are a good distance apart.

4. A common aiming point for all batteries can be used *if* it can be located and be visible from each battery position.

Whenever possible, battery positions should be located by inspection. If traverse is necessary, start from the known point



*nearest* to the battery location; long unnecessary traverses have been run, leading only to errors and waste of time. Batteries can also be located by long- or short-base intersection.

If batteries can be seen from the OP, vertical control is simple; if not, an altitude can be assumed in the position area with relation to the target area, and altitudes determined for the three batteries. An approximate interpolation can be made of stream lines to get an assumed elevation in the position area that will be reasonable. Registration will then tie in the target and position areas so that map distances can be used to determine the angles of site necessary for the concentrations. The scale of the map, if not known, must be determined.

Test II calls for preparations for night adjustment. This should be progressive, without sacrificing any work that is necessary for the transfer of fire. Common errors have been the selection of OPs with less than 500 ft intersection, failure to provide substantial orientation for use at night, direction markers of poor material and too close, observing instruments not calibrated to read angles of site correctly, OPs poorly located horizontally and vertically, and incorrect data prepared by FDC for the observers.

An air adjustment is also included in this test. Communications should be good, a rapid registration handled intelligently, and corrections determined accurately at the end of registration.

The time for the completion of this test will vary because of the factors as mentioned for Test I. The other causes observed for inaccurate and slow fire in Test II are the same stated in Test I. The battalion commander should maintain a constant supervision to be sure his battalion is acting as a team. He should follow the essential steps through. There is only one adjustment, so watching results from the OP is of no help. This test counts 30% of the combined score for the three.

### TEST III

This test, conducted by brigades, division artillery, separate groups, or separate battalions, stresses necessary survey for maximum benefit from map data corrected. It is without speed, and includes a night occupation of position. The firing chart is a grid sheet.

The problem starts in the morning with the known information being a place mark and a direction to some point in a target area which varies from any known data; battalion position area or areas; the tactical situation; and a series of single verticals, photomaps, or wide-angle photographs covering both position and target areas. The first day is spent on making a complete survey and preparing for night occupation and for a night adjustment (which is made by each battalion). The high-burst adjustment is separate and distinct from the remainder of the test, and its adjusted data is not used in firing the concentrations. Additional verticals or photomaps of the target area showing concentrations to be fired are given after dark.

Before a plan of survey is devised time should be taken to study the photographs so that a good general idea can be obtained of the work necessary for locating known points (1) in the target area for restitution and altitude interpretation and (2) in position area for battalion place marks. Plan to start the target area survey as soon as possible, and give it priority over the other survey work. The weather may change or darkness may descend all too soon, so make maximum use of the available clear

weather—as no target area survey can be performed if visibility is zero. A good system is to have two division artillery survey parties: a topographical target area party, and a connecting area party for the establishment of battalion place marks. Personnel can be obtained from the battalions if necessary. This survey personnel should be nearby so that they can start their work as soon as possible. The battalion survey officers should also be at hand so everyone will thoroughly understand the entire plan of survey, and what each unit is to do.

While the survey officer is devising a plan of survey, one direction instrument could be declinated for the false control. Then each battalion can be told the constant that is necessary to apply to the declination constants they already have on their instruments. This is needed so that battalions can check their laying and the metro section can get their orientation. The metro section will also need to know their false altitude before they can distribute metro messages. This is important, because this false control has been the source of numerous errors.

Target area survey must locate points on the ground that can be picked up on the verticals or photomaps (to permit restitution), and also a number of points for altitude determination and interpolation. At least three well-spaced points should be located (for restitution purposes) by short- or long-base intersection. For tactical reasons it might be necessary to "short-base" the base line that is needed for the intersection method used.

Enough time is available to have the survey parties work as accurately as possible. All should be tied together with common control, and use same degree of accuracy. For the connecting area survey it is generally easier to use short-base or long-base intersection for the battalion place marks in the vicinity of position areas.

Each battalion survey officer should thoroughly understand where battalion place marks will be, how they will be marked, and just what work he has to do in connection with their establishment. These place marks should be very clearly marked. A tripod about 7' high with some panel cloth around its apex and a hook in the center for attaching a plumb bob for centering, could be used. Then if distance is great enough, direction shots could be taken to the center of the panel cloth or, if the direction shots are short, one man can get under the tripod and use a plumb-bob line or sight pole over the point on the stake. A survey information center should be established at a central point among the position areas, and all control data sent there as soon as possible.

Battalion survey work generally consists of a connecting area survey and a position area survey. The connecting area survey can start with assumed coordinates, elevation, and direction. Perhaps the chief survey officer can select a reference point that can be used for all battalions; then, when the locations of this reference point and battalion place marks are obtained, each battalion could receive its correct initial data.

The battalion position area survey plan should be determined from the position area. The center battery's position, or a high point where the best idea of the battery layout can be determined, is generally best for estimating the necessary work. A logical, simple orienting line should be staked out. The same remarks concerning orienting lines on Test II hold for this test. The orienting line should be staked out clearly and batteries located from battery place marks while the connecting

area survey party carries down the control to tie in to end of the orienting line. Since this will be used after dark in blackout, care must be taken to insure against any mistake in identity of the orienting line stakes.

For the night adjustments, the battalion should be informed as to what OPs they are to man and which ones (if any) they must locate by survey. Calibration of all the observing instruments should be checked. The VE obtained by this adjustment is not used as it would correct for all survey errors, if executed and used correctly, but the VE from this registration should be computed accurately.

In all survey work, double check on all operations. Keep neat, accurate survey notes and computations. Concerning survey for this test, remember these three things:

1—Survey with errors is of no value, is a waste of personnel and time, and is extremely dangerous for our troops.

2—The best survey data are of no value if mistakes are made in applying them.

3—Field Manual 6-40 covers field artillery survey thoroughly.

Inadequate provisions for night occupations of position have frequently been apparent. In these preparations, each battery commander must consider every factor necessary to get his battery into position, ready to fire, during blackout, without any confusion. Any old VE and any calibration constants known for the guns should be used.

This test counts 10% of the combined score of the battalions for these three tests. The remarks above on survey, and also the discussion of survey in Test II, are offered as guides for good survey procedure. Other causes for inaccurate fire in this test are the same as stated in Test I. The "Whammies" can be licked only by constant supervision and checking.



King D. Simon

Bankston Waters

C. W. Chandler

William Boyd Rist

Robert J. Heil

Francis M. Wright

Joseph B. Kelly

## 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 Lieutenant Colonel Charles Wing Chandler, Ohio State University; member Delta Tau Delta, Pershing Rifles (honorary military), Phi Eta Sigma (honorary scholastic); intramural sports participant.

Cadet Colonel Robert J. Heil, Xavier University; member Xavier Order of Military Merit, Inter-Collegiate Debating Team; director intramural athletics; sports editor, Xavier News; secretary Heidelberg Club, Philopedian Debating Club; winner Verkamp Debate Medal, Charls F. Williams Military Scholarship.

Cadet First Sergeant Joseph B. Kelly, Xavier University; member Xavier Order of Military Merit.

Reservist Thomas M. McEwen, ASN 14,118,244, University of Florida.

Cadet Sergeant William Boyd Rist, University of Nebraska; member university debating team, Alpha Tau Omega, Delta Sigma Rho (honorary debate).

Cadet Sergeant Charles R. Schueler, Princeton University; member University Cottage Club, Varsity Lacrosse Team.

Cadet Second Lieutenant King D. Simon, University of Oklahoma; member Kappa Alpha, Camera Club, Advertising Club, Scabbard and Blade.

Cadet First Sergeant Bankston Waters, Arkansas State College; first class gunner, winner of three citations; member Kappa Sigma Nu, Historical Society, Scabbard and Blade; president Engineers' Club, Junior Class.

Cadet Second Lieutenant Francis M. Wright, University of Illinois; second class gunner; awarded excellence bar and three stars; member Pershing Rifles, F. A. Crack Squad.



# 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

## THE WAR WITH JAPAN (April 21st to May 21st, 1943)

### THE BURMA-INDIA FRONTIER

Since April 1st the enemy has crowded the British troops on the coast of Burma backward about 50 miles. Their last advance was on May 12th, when the British completed evacuation of the Maungdaw-Rathedaung line. The Japanese had infiltrated around the left of the line, and was in a position to cut the line of communications. The British withdrawal was not interfered with by the enemy.

This little campaign in a far-away corner of the world started last December, when a force of British and India troops advanced across the frontier and swept down the coast almost to the Japanese advance base at Akyab. It was at one time hoped that this success was just a prelude to the recapture of Burma and the reopening of the Burma road into China. However, no further effort was made to advance.

A secondary British expedition started in January. This was further north, on the Assam frontier. The advance force was composed mostly of native troops who crossed difficult jungle covered mountains and reached in the same month the left bank of the Chindwin River. It thereupon started a series of harassing raids against enemy lines of communication and small posts, and also to open better trails back to India. The latter mission having been accomplished, early in February a large British force followed, crossed the Chindwin River, and operating in small detachments penetrated as far as the Irrawaddy River. At numerous places it interrupted the railroad going north from Mandalay and inflicted considerable damage. This force lived off the country and from dropped supplies.

By April the Japanese had concentrated forces to the north, east, and south of the British and threatened to encircle it. It therefore withdrew, and at the close of the period covered by this article has returned to India. The Japanese are now practically on the boundary between Burma and India.

According to Japanese reports, in the entire campaign along the India border the British lost 6,414 killed (counting only those buried by the Japanese), 574 prisoners, 207 guns, 83 tanks, etc. Their own losses were stated to be 714 killed and 1,364 wounded. This report should be received with reserve.

### THE SOUTH PACIFIC ISLANDS

Early rumors as to the enemy reinforcing his air forces and air bases in this area have been confirmed by additional reports. Enemy air raids are increasing noticeably in frequency and in strength. So far they have accomplished no particular

damage. According to a statement made by the Japanese Gen. Nakao Yahagi at Tokio on April 30th, Japan has completed its new bases in the southwest Pacific, including Timor, New Guinea, and the Solomon Islands. Additional bases are known to exist in Celebes, Amboina, and New Britain, the last being an extensive one. The Jap general explained that the line of air bases extended in a circle around Japan at an average distance of about 3,100 miles, believed to be sufficient to protect Japan from air attack.

### THE ALEUTIAN ISLANDS

An American attack on Attu Island was made on May 11th. The initial attack was made at 0200. At this latitude it was not entirely dark at this hour, but there was so dense a fog that visibility was almost zero.

The enemy had foreseen this attack, for his radio mentioned its coming as early as April 30th and frequently thereafter. It is presumed his air reconnaissance had observed the preparations.

Notwithstanding the fog, our navy fired an artillery preparation against known and presumed enemy positions about Holtz Bay on the northeast end of the island. Barges then landed troops. The Japanese fought hard and appear to have caused a considerable number of casualties. Later in the day a second landing was made at Massacre Bay, due south from Holtz Bay on the opposite shore of the island. The Japanese claim that the first attempt to land failed, 10 out of about 27 landing barges being sunk. After a renewed artillery preparation, a second attempt succeeded. The two American landings were separated by a saddle in a mountain range and by about three miles in distance.

A week's hard fighting followed before the Americans, attacking toward each other, made a junction on May 18th. The pass over the saddle was finally cleared by the aid of naval artillery fire. Planes could seldom be used, due to nearly continuous fog.

As this account closes the enemy has been confined to the east end of Attu, where his main base has been near Chichagof Harbor.

At Attu the enemy had commenced construction of an airdrome for bombers. It had not been completed, and is now already in American possession. At Kiska the enemy has also under construction an airdrome, but so far as known this is to be for fighter planes only. Our capture of Attu, which appears

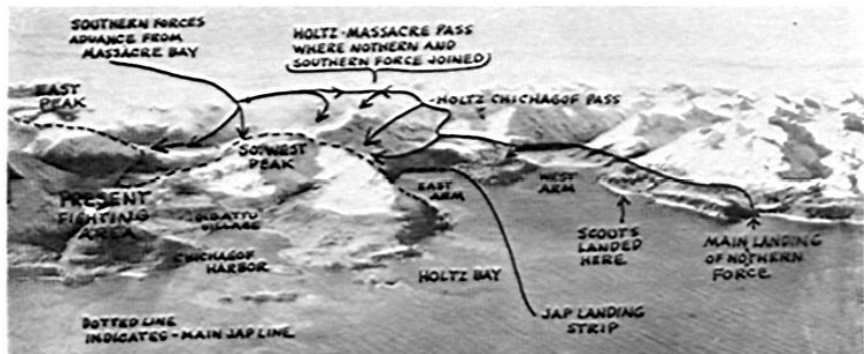
imminent, will deprive the enemy of his far north bombing base and will give us a bombing base which will be only some 2,100 miles from Japan, well inside the 3,100-mile limit set by the Japanese as necessary for their own safety. Attu will now become our nearest base to Japan.

#### JAPAN'S CENTRAL AREA

Japan is carrying on an aggressive warfare in China. The mission is not so much conquest as it is to throttle the economic life of China. Most of the military expeditions are in the nature of large raids against areas which produce food or something which might aid the Chinese.

The major Japanese expedition is now operating south of Ichang, and is within 180 miles of Chungking, much closer to the Chinese capital than the Japanese have before had ground troops. However, the direction of advance is not toward Chungking but rather southward into an important rice and food area. The Chinese estimate this enemy force as between 50,000 and 60,000 men, or about 5 or 6 divisions, completely equipped with armor, guns, and planes. This expedition is composed exclusively of Japanese line troops.

Other Japanese forces are conducting less ambitious operations in other parts of unoccupied China. These are largely composed of Chinese mercenary troops enrolled in the Japanese army or in the army of Nanking China. The growing number of these troops, and their increasing efficiency and willingness to operate against their own countrymen, is an indication of the ability of Japan to consolidate her hold on the most populous part of China, which is also the most important part for production of food, raw materials, and manufactures.



Japan is working quickly and with much energy to organize as much of China as possible against a possible Anglo-American invasion.

While it is difficult to determine how much progress Japan has really made, constant reports are coming in that her progress is increasing at an expanding rate. The consolidation of China includes an ambitious program for the establishment of large and numerous munitions plants of all kinds, distributed over a great area. By this means Japan hopes that even if her cities are bombed and reduced to ashes, her ability to produce what she needs to continue the war will remain unimpaired.

Japanese efforts in the military-economic line are not confined to China. They are going on in the great areas which Japan has captured from the United States, the British, and the Dutch. In all the countries so taken, population is dense and ample labor is available. They all have valuable resources and are sufficiently civilized to undertake large enterprises.

From independent Korean sources comes information that Japan is completing a series of airfields in the Kuerile Islands, with offensive operations contemplated. This has not been confirmed, but is consistent with other known Japanese activities.

## RUSSIA (April 21st to May 20th, 1943)

During this period the daily Russian communiqués have regularly announced "no significant changes since last report," or words to that effect. And this just about correctly represents the situation. Both sides have been engaged in regrouping and reorganizing their forces.

Considerable hard fighting has taken place in Kuban. When the Axis withdrew from Caucasia in January of this year, a considerable part of their troops which were north of the Caucasus Mountains turned south at the Kuban River and withdrew into the Novorossisk area. This simplified the German problem of withdrawing its army through the Rostov bottleneck. It also preserved to the Axis a good sized and important base east of the Sea of Azov. The base included the area from near Kabardinka (southeast from Novorossisk) north to Krimskaya and Temyruk (both inclusive).

Novorossisk is a good port and was a secondary naval base. Its possession will benefit the Axis should it decide again to invade the Caucasus territories. It covers the Crimea and thereby hinders a Russian effort to recapture that territory. With the Crimea, the

occupation of both sides of the entrance to the Sea of Azov safeguards the right of the Axis main line, which reaches this sea just east of Taganrog.

Russia has been endeavoring to recapture Novorossisk. Almost daily savage attacks were made. A very large amount of artillery was brought up, and intense and prolonged shelling of the German lines was undertaken. Attacks were supported by strong tank and air forces. The details are not yet known, but the Russians gained along the shore east of Novorossisk; they captured Krimskaya, and they made some gains along the lower Kuban. For a while it seemed that the Russians would succeed. The Axis was able to bring in replacements and supplies by sea as well as by ferry from Kerch. The Russian attack was then halted, and some of their gains were recovered. The net result has been a slight reduction in the Axis perimeter, with the fighting still continuing. At the end of the period the Axis was on the offensive.

The main front has been generally quiet, and no change has occurred in the line. Raids to secure identifications are daily

events; both Russians and Germans appear to be fairly well cognizant of the situation opposite them. The thaw has about disappeared at the end of May, and there is no terrain difficulty to prevent initiation of a major campaign. Still, the ground will be still better at the end of June, so operations may be deferred until that time.

The Russian estimate of the situation reports large hostile forces of all arms concentrating in the general vicinity of Orel and Belgorod. Russia does not consider that Germany has sufficient troops left to undertake an offensive on anything like the scale of those of 1941 and 1942. A minor offensive might take place.

Assuming that the Russian report is correct as to the location of the enemy's mass of maneuver, its position would lead to the belief that an attempt would be made to capture Kursk, now back in Russian hands. Kursk is nearly at the center of a large salient extending into the German lines, nearly rectangular in shape, the west boundary of which is marked by the cities of Sievsk, Ryisk, and Sumy. The depth of the salient is about 90 miles, and its width a little more. If the Axis could reduce this salient it would shorten the front about 180 miles, simplify some Axis supply problems, and place in their power some good agricultural country.

Just north of this salient is another which is in Axis possession and extends around Orel. At its narrowest point, west of Orel, it is less than 50 miles across, while its length is over 100 miles. According to German reports the Russians are massing troops on both sides and around the head of this

salient. The troops on the south side are within the Kursk salient. Russia tried hard last winter to capture Orel. Attacks on the north and east sides failed, with apparently unusually heavy losses. On the south the Russians drove in the Kursk salient, and they want to hold it in order to further their efforts to take Orel. If Orel could be taken it would give Russia the use of an important north and south railroad, which would materially aid her supply troubles.

No information has been recently noted regarding the progress, if any, of a new railroad which was started from the head of the Gulf of Bothnia, through Kemijarvi, toward Kandalaksh, an important station on the Murmansk Railroad. This front has been suspiciously quiet. The mission of the new railroad was to enable a sufficiently large force to be assembled in this area to undertake an offensive against Murmansk. Any prolonged interruption of the Murmansk Railroad would affect the Russian system of supplies.

Reports from Iran are that the line of supply from the Persian Gulf, which is partly by rail and partly by motor transportation, is now in full working order and daily shipping many thousands of tons of lend-lease supplies to the Russians. Russia is developing new sources of food products, raw materials, and manufactured articles in Siberia and the Ural region. It will take time to accomplish this gigantic task. In the meantime the supplies sent by the United States and Great Britain via Murmansk and through the Persian Gulf are required to keep the Russian armies equipped.

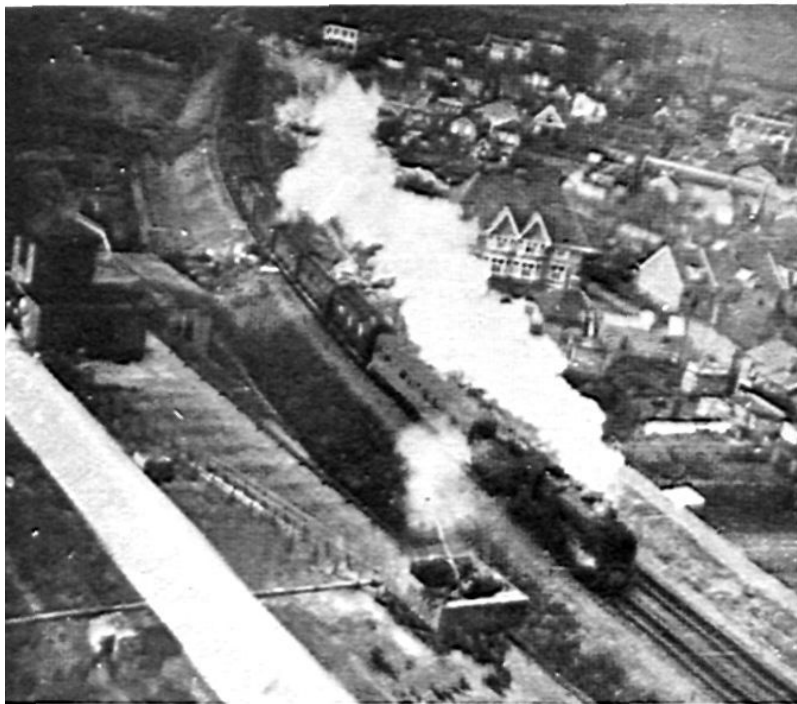
## THE FORTRESS OF EUROPE

The Axis has had just about three years to fortify the west coast of Europe, from the North Cape to the Pyrenees Mountains. The center section of this line (from Denmark to Brittany, both inclusive) offers an invader a wide choice of

excellent beaches, giving direct access to important Axis areas. It is also nearest to the Allied base of Great Britain. It is not surprising that on this front the most extensive systems of field works have been erected, backed by large forces of mobile troops.

A large part of the Norwegian coast is unsuitable for an invasion, and is a considerable distance from Great Britain. The west coast of France is suitable but is farther from British bases. The Axis has erected fewer fortifications in these sectors.

In south France no fortification work had been done prior to last November except for the permanent French fortifications about Toulon and Marseille, which appear to have fallen intact into Axis hands. Since then extensive systems of defense have been initiated but are yet




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*Daylight attacks on European industrial targets are carried out at very low altitudes. The light flak on its wooden tower in the foreground is supposed to protect both the railroad and the Hazemeyer electrical and mechanical equipment factory at Hengelo, Holland; it has no chance of hitting the plywood Mosquito from which this photo was taken. The shorter type of passenger coach, following the long one next to the engine, is commonly used in Holland.*



Air photographs have shown that very extensive destruction of ports has occurred, but to date no port has been completely closed permanently by bombing. Photographs show extensive destruction in Germany to production centers, or what were formerly production centers, with exact results very uncertain.

The present state of German production is not known. French reports (of 1939 and earlier) stated that, foreseeing the probable bombing of large works, Germany had already initiated a program of decentralization, by forming a multiplicity of small shops. A single lathe or other power tool might, for example, be installed in the home of the operator. Something of this kind has been attempted, but there is lack of reliable reports as to results: reports from neutral sources are of doubtful validity, especially as they differ completely. As Mr. Churchill stated in his address of May 19th, whether these extensive series of bombings will have a decisive effect on the war, remains to be seen. But it is at least promising, and worth trying.

Air raids do not seem to have seriously affected the morale of the enemy's populations. This is in line with previous experiences in the Spanish Civil War, in China, and in London. In no case yet has air raiding of cities caused the inhabitants to cry for surrender. The present system of bombing is on so much larger a scale than the previous efforts that these can not be accepted as sure precedents. Some of the recent raids in Europe have caused serious losses among the civilian population, the most disastrous probably having been in Antwerp, where about 2,000 were reported killed. One effect of the raids has been to reduce the resistance of the inhabitants of occupied territories to removal from coastal areas. As they usually have no place to which to go and must do something to earn a living, many have unwillingly accepted employment in Axis factories in order to provide food and shelter for their families. For some time the entire production system of the Axis has been undergoing radical changes as to locations and methods. In general the same plan is being followed as that of the Japanese—demobilization of large plants and scattering of production over wide areas.

New industries in Axis countries are reported from Rumania and from Hungary. Rumania has long had extensive steel and oil plants which could form a basis for expansion. Hungary has never been a large industrial country. German reports allege that Ukraine industries are coming into line, but nothing trustworthy is known as to how extensive this may be. Some German plants have moved to Norway. As Germany has been engaged for several years in reorganizing its industries with special view to bombings of its cities and large industrial areas, it must be expected that considerable progress has been made in this line.

A recent speech by Chancellor Hitler alleges that German production is larger than ever. This may or may not be so, but there is a possibility that it is. The Axis is now in a position of

readiness, on the strategic defensive awaiting an invasion and with the probability that the tactical offensive will be adopted as soon as invasions occur.

PRINCIPAL PLACES RAIDED IN 1943			
Planes lost in ( )			
	<i>Germany</i>	<i>France and Low Countries</i>	<i>Italy</i>
March			
22	Wilhelmshaven (5)		
23		St. Nazaire (1)	Messina (1)
24			Messina (2)
27	The Ruhr (6)		
28	Berlin (9)	Rotterdam and Liege (3)	
29		Rotterdam and St. Nazaire (2)	
30	Berlin (21)		
	Ruhr (12)		
31			Cagliari (3)
April			
3		Lorient and St. Nazaire (2)	
4		Paris (13)	Naples (4)
5	Kiel (12)	Antwerp (19)	
6			Trapani, etc. (7)
9	Ruhr (25)		
10	Ruhr (10)		
11	South Germany (22)		Naples, Trapani, and Marsala (12)
12			South Italy (3)
13			Trapani (10)
14			Spezia (3)
15	Stuttgart (33)		Naples, Messina, and Palermo (3)
16		Lorient and Brest (6)	Catania and Palermo (2)
17	Bremen (20)		Palermo, etc. (11)
	Pilsen (37)		
	Mannheim (18)		
18			Palermo, etc. (9)
19		Lorient (1)	
21	Rostock and Berlin (32)		
22			Syracuse, Ragusa (2)
25			10 miles from Naples, error due to weather (0)
26			Grosseto (3)
27	Duisberg (21)		
28			Messina (0)
29	Wilhelmshaven (23)		
30			Messina (5?)
May			
1		St. Nazaire (1)	
4		Antwerp (5)	
5	Dortmund (37)		
6			Trapani, Marsala (7)
8			Pantelleria (19?)
9			Sicily (21?)
10			Sicily (5)
11			Pantelleria (5)
13	Duisberg (43)		Cagliari (3)
14	Wide Front (34)		
15	Emden (6)		
17	Dams, etc. (10)	Bordeaux (14)	
18			Pantelleria (7)
19	Kiel, Flensburg (6)		Milo (4)

"I find THE FIELD ARTILLERY JOURNAL very excellent for training purposes. It proves expedient to keep a back file of them. With the article in the January issue on .30-cal. mounts as an example, we are adapting the mounts for use on our 105-mm howitzers in this battalion. Very satisfactory."—LT., FA



# Suprise Fire Without Registration

By Col. Christiancy Pickett, FA

The AGF tests teach us never to make a bracket adjustment on a transient target if it is possible to attack it with surprise fire using K-transfer methods. The inference in this admonition is that bracket adjustments, even when rushed to completion in four minutes, give the enemy personnel all too ample an opportunity to disperse and take cover. World War I veterans can all verify this from their own experiences at the uncomfortable end of the trajectory.

Something is wrong with our methods of bracket adjustment, and in an attempt to get some of them completed in one salvo a group of heretics invented that execrable sensing "Range and Deflection Approximately Correct" and thereby placed a mirage before the eyes of thousands of wishful thinking OCS graduates—a haze in which they fancy that they see a perfectly adjusted salvo on the first round after guessing at their initial data! This is not the solution, nor will any solution stand up which fails to conform to the principle of *bracketing the target*.

Gunnery instructors at the FAS are giving students 1 minute to compute their initial data and 4 minutes to adjust. To get the best results this ought to be reversed. A transient target is like a deer grazing on a hillside upwind from the hunter. It may remain visible for a few minutes, but only because it is unaware that it is under observation. The minute shooting starts it moves away. Therefore, the first shot *must* be well aimed. Good initial data is essential and there will probably be time for it. So take the four minutes and get some approximate initial data.

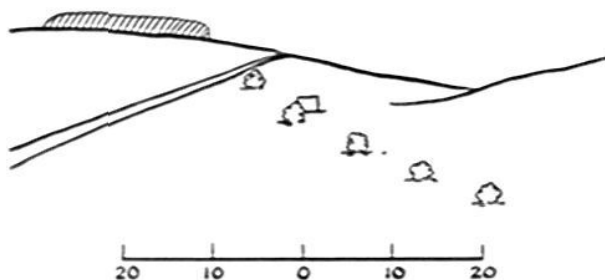
But how to get through adjustment in one minute? That means going to fire for effect after one salvo, or two at the most. With good initial data, it is believed this can be done by "forking" the target—i.e., firing a salvo with 100-yard sheaf but with the guns laid 2c's apart in range. In the following examples the author will use a 5-gun battery (an arrangement recommended by him in a previous issue of THE FIELD ARTILLERY JOURNAL,\* which obviously has additional advantages for this method of adjustment).

## EXAMPLE 1: AXIAL

Computed elevation, 320.  $c = 8$ .

*Commands:* "Battery Adjust, etc., etc. Fork salvo right, at 5 seconds interval, elevation 288 to 352." This suggested new command causes the executive to lay No. 1 at 288, No. 2 at 304, No. 3 (always the base piece in a 5-gun battery) at 320, No. 4 at 336 and No. 5 at 352.

*Results:*



\*July-August, 1939, p. 345.

*Sensings:* "Short, short, short, short, over."

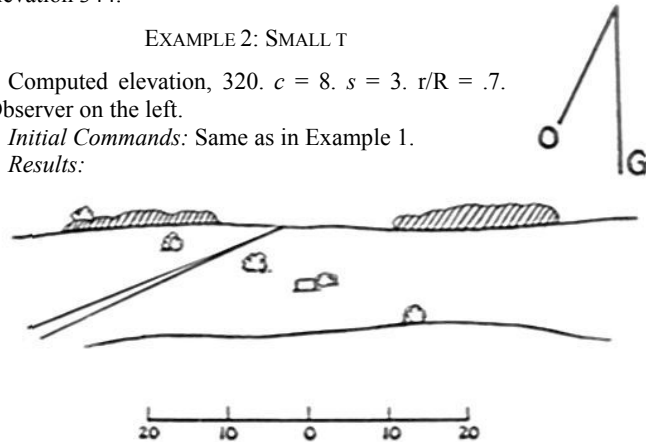
*Next Commands:* "Left 7, Battery 1 round, Zone 8 mils, elevation 344."

## EXAMPLE 2: SMALL T

Computed elevation, 320.  $c = 8$ .  $s = 3$ .  $r/R = .7$ .  
Observer on the left.

*Initial Commands:* Same as in Example 1.

*Results:*



*Sensings:* "Short, over, 6 left over, over, over."

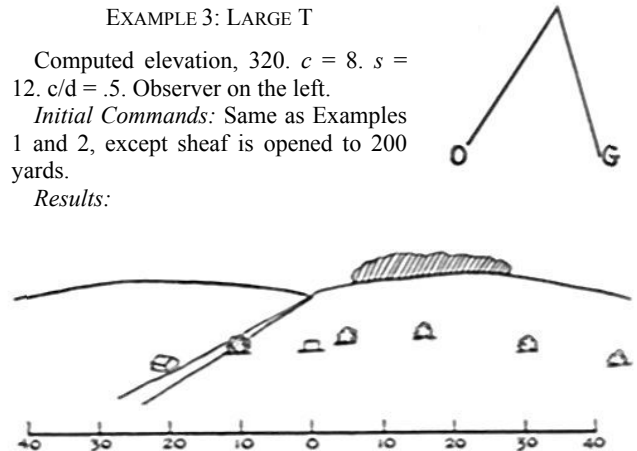
*Next Commands:* "Left 5 (R 4 to get on; L 9 to stay on). Battery 1 round, Zone 8 mils, Elevation 296." (The deflection setting for fire for effect is taken as that setting which should put the center gun, No. 3, on the OT line at the center range. This will prove to be plenty accurate enough in bracket fire.)

## EXAMPLE 3: LARGE T

Computed elevation, 320.  $c = 8$ .  $s = 12$ .  $c/d = .5$ . Observer on the left.

*Initial Commands:* Same as Examples 1 and 2, except sheaf is opened to 200 yards.

*Results:*



*Sensings:* "Deflection over, deflection over, 17 right deflection over, deflection over, deflection short."

*Next Commands:* Left 20, On No. 3 close 5, Battery 1 round, Zone 8 mils, Elevation 315."

Since bursts are 50 yards apart for direction and all are deflection over except No. 5, it is approximately correct to assume that No. 3 is about 75 yards over for deflection and that the sheaf can be adjusted for direction by going left (75 yards  $\div$  R) or in round numbers 20. The range that will put No. 3 on the OT line after such a shift is taken for the center. No. 3, fired at 320, is on line at 328 ( $c/d \times 17$ ) but must be reduced 1.6 c's (or 13) to keep it on. Thus, center range is computed at elevation 315. The sheaf is closed on the center piece to 100 yards for effect.

# A SITE COMPUTER

By Lt. Col. F. H. Skelly, FA

The device described in this article provides a mechanical method for the computation of site by the Vertical Control Operator in the Fire Direction Center. It has the advantage that the VCO can determine the site setting, *including complementary site*, almost instantly after he has determined the altitude of the target; there will be no mistake in his computations, because he does no computing—and the result will be accurate to the nearest mil. Its disadvantages are that it is another piece of equipment, and that the site disk must be changed (or a duplicate computer provided) when there is a choice of projectile, charge, or fuze.

This computer is set up for operation by placing the Altitude Indicator at zero, loosening the two clamps, and then rotating the three battery disks to place the altitude of each under the Altitude Indicator. The three disks are then clamped. This is illustrated in Figure 1, the altitudes of the batteries being as follows:

Affirm:	355 yards.
Baker:	360 yards.
Cast:	362 yards.

Next, with the Altitude Indicator still at zero, the zero site line of the desired ammunition graph is placed under the Altitude Indicator and clamped. The device is now ready for operation. In Figure 1 it is set up for 75-mm gun, Shell HE, Mk I, Normal Charge, Fuze M46.

To operate, place the Altitude Indicator in turn at the target altitude upon each battery disk. Place the Range Indicator at the proper range. At the intersection of the two indicators read the site setting, which by construction includes complementary site. In Figure 2, the altitude of the target has been determined to be 410 yards (from the firing chart); the site setting for Affirm Battery, at a range of 5000 yards, is 312 (plus 12).

The model illustrated is exactly 12 inches square, a satisfactory size for the 75-mm gun. With longer range weapons, it might be desirable to increase the size somewhat.

Battery altitude disks are colored in the standard manner, namely: Affirm: Red; Baker: White; Cast: Blue. A wide range of altitude should be provided, as illustrated, and the figures should be erasable so they can be changed to fit any particular locality. The illustrations show graduations in yards, but the reverse sides of the disks are graduated in feet;

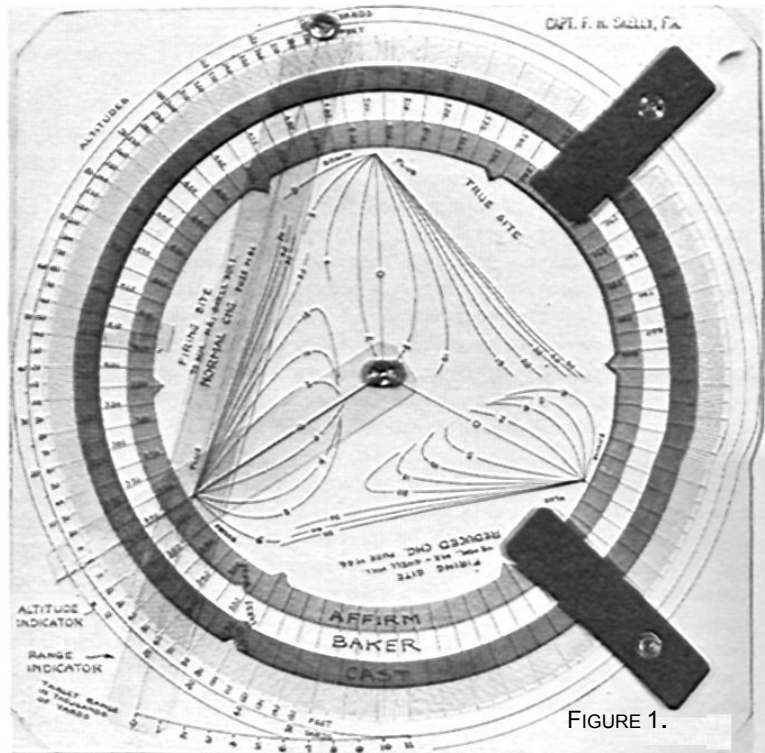


FIGURE 1.

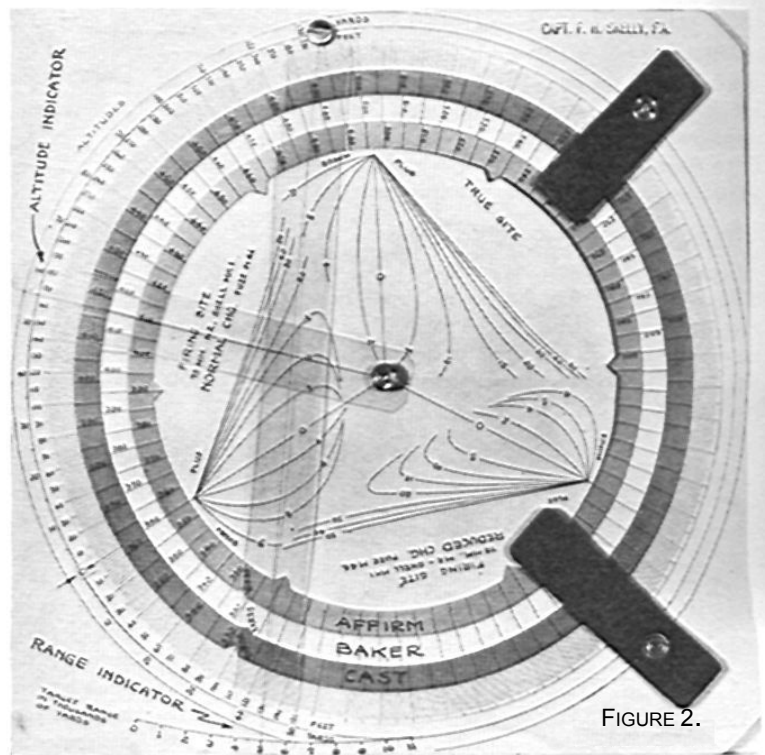


FIGURE 2.

this makes the device usable directly with a battle map graduated in feet, or with a photomap showing critical altitudes in yards.

The outer altitude scales on the base of the device show the difference in altitude of the target above or below the guns, in both feet and yards. These may be used, if desired, in conjunction with a graph of true sites (without complementary site) to make mil relation computations mechanically.

Two clamps are provided. One holds only the three battery altitude disks. The other, when loosened, permits the site disk to be moved or changed without disturbing the battery altitude disks. The clamps are tightened by means of knurled thumb-nuts.

Indicators are made of lightweight transparent xylonite.

The curves upon the site graphs may be numbered to read site settings directly, if desired. For example, a setting of plus 5 would read 305, a setting of minus 2 would read 298, etc.

Construction of the curves is relatively simple. Faint pencil lines are drawn from the Range Indicator pivot to each 1000-yard graduation upon the range scale. A ruler is pivoted about the pivot for the altitude indicator; by placing its edge at a predetermined difference in altitude, the point on the site curve for that altitude difference will be on the range line at the edge of the ruler. For example, assume we wish to plot the point on the 8000-yard range line for a site setting of + 10 mils (310). The general formula for the site setting is  $S = W/R \times (1 + C)$ , in which  $S$  = site setting in mils,  $W$  = difference in altitude in yards,  $R$  = range in *thousands* of yards, and  $C$  = complementary site percentage (from the firing tables). This formula reduces to  $W = R/(1 + C) \times S$ . In the particular example, where  $R = 8$  and  $S =$  plus 10, the equation becomes  $W = 8/1.30 \times S = 6.154 \times 10 = 61.5$  yards. It will be noted that  $W$  is equal to a constant for the particular range, multiplied by the site setting to be plotted; this simplifies both computation and the plotting of the curves.

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#### FILM STRIPS

Recent releases of film strips include the following of special interest to artillerymen:	6-22—Same, Part III—Handling
5-33—Fixed Bridges — The Timber Trestle Bridge, Part I	6-23—Same, Part IV—Projectiles and Propellants
6-19—The Graphical Firing Table	6-24—Same, Part V—Fuzes
6-20—Field Artillery Ammunition, Part I—Marking and Packing; Transportation	6-25—Same, Part VI—Boosters
6-21—Same, Part II—Storage	10-96—Messing, Part II—The Railway Kitchen
	12-2 —A Soldier's General Orders
	12-4 —How to Wear Your Uniform
	30-3 —Censorship of Mail

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#### ORGANIZATION OF ARTILLERY COMMAND IN THE BRITISH ARMY

To help American artillerymen obtain a basic understanding of the British artillery set-up, these outline notes have been prepared. It should be noted that the Artillery of a formation consists of A/Tk, Field, A.A., Medium, Heavy, and/or Seacoast, as circumstances may dictate—and always includes the first three.

In the *War Office* itself, two major generals head up phases of artillery work. Director of the Royal Artillery (D.R.A.) is responsible for matters connected with Weapons and Organization. Major-General, Royal Artillery Training (M.G.R.A. Trg.) is responsible for Training and Tactical Handling.

The Director-General of Artillery (D.G. of A.) is found in the *Ministry of Supply*, where he is responsible for Technical Services for all Army Weapons. That is, his work includes research, design, development, experiment, and inspection.

Each *Main Theater of Operations* includes two major generals of artillery. The Major-General, Royal Artillery (M.G.R.A.) is responsible for carrying out the W.O. policy in his own theater as adviser to the Commander-in-Chief and suggesting any changes, etc., through the C. in C. to the W.O., with regard to Artillery other than A.A. The Major-General, Anti-Aircraft (M.G.A.A.) is similarly responsible with regard to all matters concerning Anti-Aircraft Artillery.

At *Army H.Q.* the Brigadier, Royal Artillery (B.R.A.) is responsible to the Army Commander for seeing that his plans are put into effect as far as the Artillery is concerned, and for carrying out or suggesting amendments to W.O. policy. He is an adviser, planner, and trainer, but does not normally command directly any regiments of Artillery.

At *Corps H.Q.* the Commander Corps Royal Artillery (C.C.R.A.) is adviser to the Corps Commander on Artillery matters, and commands such artillery as is permanently or temporarily placed under Corps control.

In each *Division* the Commander Royal Artillery (C.R.A.) commands the Artillery of the Division and advises the Divisional Commander.

The Commander Army Group Royal Artillery (C.A.G.R.A.) commands a Group of supporting artillery held in *G.H.Q. or Army reserve*. He (and his staff) train and fight their group, or may be called on to provide a Group H.Q. for any other "ad hoc" groupment ordered.

# Useful Points from Austrian Field Artillery

By Lt. Frederick W. Hess, FA

When the Nazi war machine overran little, undefended Austria in 1938, the tradition of one of Europe's oldest and most glorious armies came to an end. The Austrian Army (since 1918 reduced to about 30,000 men) was noted for the high standards of its field artillery, and so efficient were its ordnance and gunnery designs that some of their features deserve attention even now. They may appear helpful in a good many situations encountered by our forces and have not, to my knowledge, been previously discussed in these columns.

Austria being a rather mountainous country, emphasis was placed on artillery materiel that could easily be transported over the roads and paths found in such terrain. To meet these requirements, not only were special mountain guns and howitzers provided, but also simple designs were made and applied which quickly and easily converted regular field howitzers into alpine narrow-gauge materiel.

The Austrian 10-cm mountain howitzer, a World War I model, when assembled possessed most of the characteristics of our 105-mm howitzer and was capable of approximately the same range. On the march it was disassembled into three units: (1) tube and breech, (2) carriage (less wheels), and (3) shield, wheels, and section chest. Each of these units was placed on a supporting cart of very narrow gauge, drawn by two horses in tandem fashion. Through this disassembly the howitzer could be hauled over narrow and winding roads otherwise inaccessible for pieces of this caliber. As reassembly of the piece by a well-trained crew, often rehearsed as a part of standing gun drill, took not more than five minutes, the effectiveness of this piece in mountain warfare was considerable. It was capable of a very high elevation which, combined with the use of low propelling charges, eliminated a major part of the dead space.

Besides this 10-cm mountain howitzer, other field howitzers and guns were modified to increase the maneuverability over mountainous and otherwise difficult terrain. These pieces were fitted for disassembly into three units and for transportation on narrow-gauge supporting carts similar to those for the above-mentioned 10-cm mountain howitzer. Great emphasis was placed upon the drill of howitzer crews in this conversion of field to mountain pieces and their reassembly. While this operation required somewhat more time than the disassembly or reassembly of the regular mountain howitzer, it was still rapid enough to insure the speedy employment of such materiel according to the needs of the tactical situation.

It would seem that our troops in the jungle fighting of New Guinea or Guadalcanal, or in the mountain passes of Tunisia, could have put such mountain howitzers or convertible field howitzers to very good use.\* The value of their narrow-gauge transportation becomes the more apparent when the conditions of roads and paths in these theaters of operations are considered.

\*Correct. See *An Experiment on Guadalcanal*, page 294 of the JOURNAL for April, 1943.—Ed.

Figure 1

- T—Target.  
D—Deflection difference, i.e., amount of closure necessary to converge sheaf at (2);  $W/3R$ .  
E—Elevation difference.  
W—Width of battery front.  
S—Shift for deflection adjustment.
1. Since the officer conducting fire does not know the exact location of the gun-target line, the four bursts are spaced along this line by converging with "D" and applying the elevation difference "E."
  2. The elevation of burst (2) is selected as closest to the target and a shift "S" is made to adjust the deflection. This is combined with the first round for effect.



Ricochet fire was employed as the most desirable way to obtain the maximum effect of projectiles. Demonstrations on snow-covered ranges with infantry targets were designed to impress this doctrine upon the troops, as they could thus easily examine the path of the ricocheting projectile in the snow as well as the fragmentation effect on the infantry targets which were scattered over a wide area.

Another use of ricochet fire was in close-range defense against personnel. Using a delay-setting on the fuze, the piece would be aimed at the ground at a close distance short of the attacker. The resulting ricochet was considered a most effective means of defense because of its devastating fragmentation effect. Another method, suitable for time fuze, employed a fuze-setting for a range of 500 yards combined with direct laying at the target or, for extreme emergencies, a special fuze setting which caused a burst at the very short range of about two or three hundred yards.

In bracket fire, a method was used which deserves fullest attention as it greatly reduced both time and ammunition needed for adjustments and hence would meet the requirements of present warfare. The officer conducting fire, not knowing the exact gun-target range nor the exact location of the gun-target line, would include two additional elements in his normal set of initial fire commands: (1) the amount of closure necessary to converge the bursts of all four pieces on one

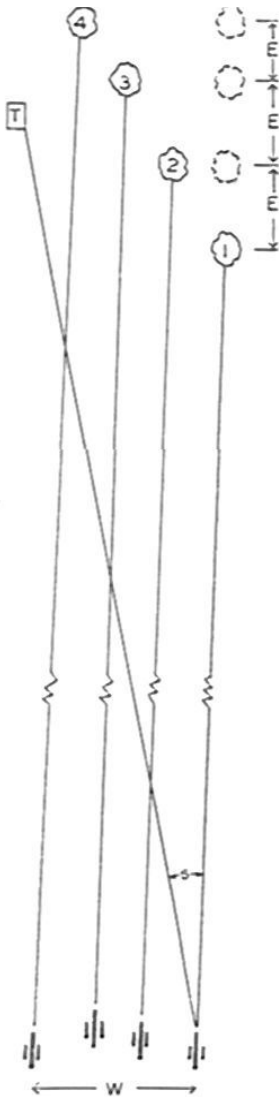


Figure 2

- T—Target.*  
*E—Elevation difference.*  
*S—Shift for deflection adjustment.*
- 1. The location of the gun-target line is known so that converging is not necessary. The four bursts are fired with parallel sheaf but different elevations.*
  - 2. The center of the bracket formed by bursts (2) and (3) is selected as closest to the target. Fire for effect is started at this elevation; if necessary, a deflection adjustment is made, preferably with the first round for effect.*

point close to the target; (2) an elevation difference of one or more c's, which would progressively be added to the elevation of No. 1 piece so that No. 2 would fire at a range greater than No. 1 by one time, No. 3 two times, and No. 4 three times the amount of the elevation difference. Through both the closure and the elevation difference, the entire volley would be spaced along the gun-target line covering a depth of 300 or more yards (Fig. 1).

If the officer conducting fire knew the location of the gun-target line, converging was unnecessary and only an elevation difference was commanded (Fig. 2). When the four bursts appeared in their depth spacing the target was included in a bracket of 300 yards or more, so that immediately the elevation or elevation bracket closest to the adjusting point could be selected and fire for effect started at this elevation or center of this elevation bracket. In most cases a deflection adjustment would still be necessary, which an experienced observer could obtain in one round—preferably the first round for effect. Consequently, with only one volley fired for adjustment, this method would make possible fire for effect at the second round, whereby the depth spacing of bursts employed during adjustment would be discontinued and a normal concentration reestablished. It would appear that this method, without requiring too complicated commands or operations from the officer conducting fire or the executive and his crew, offered the great advantage of rapid adjustment, a prerequisite indispensable to any surprise attack. In difficult terrain where one or more bursts might be lost, the elevation difference would be increased and the first round fired as a salvo. While in the above this method was developed for axial or small-T percussion bracket fire, it would with slight variations be adapted for large-T, forward observation, or time fire.

These features of Austrian materiel and gunnery methods which have been briefly treated here from the writer's recollections of them might have to undergo changes to fit the present situation. On the whole, however, it would seem that some of them might be helpful in the fight against Nazism from which in 1938 the Austrian Army—to the distress of its members—was barred.

#### SEAT CUSHIONS

With your ¼-ton trucks, and all new tractors, you will find canvas bags with zipper closures. These are NOT tool bags, nor for storage of spare parts or any other odds and ends.

They are seat cushions, to help keep your spines from going up into your skulls. In case of the jeeps, each cushion will nicely accommodate one blanket, properly folded to fit. Tractor cushions are larger, and will hold two blankets, a shelter half (with pole and pins), plus a bit of clothing.

One other point these cushion covers are meant to be *washed*. Already some units have been painting them—which is all wrong. Paint of course jams the zippers. And it does the fabric no good, either.



*Marine Corps School Building, Quantico, which houses the Field Artillery classes.*

# ARTILLERY COURSE AT QUANTICO

By Capt. J. R. Blackwell, U.S.M.C.

The Field Artillery Course, Marine Corps Schools, is an officers' school organized with the primary mission of training junior officers in the fundamentals of Marine Corps Field Artillery tactics and technique. It is designed to basically teach the duties of various battery officers and battalion staff officers.

Most of the officers ordered to the Field Artillery Course are graduates of the Reserve Officer's Class, Marine Corps Schools. Many of these students ask to attend the Field Artillery Course, while others are selected because of some previous field artillery experience or because they have the necessary educational background. The student officers are already trained as infantrymen when they attend the Field Artillery Course, which proves to be an invaluable aid in the teaching of Field Artillery tactics and technique: no time need be spent teaching infantry subjects to inculcate the importance of team play in an infantry-artillery combat team.

Director of the Field Artillery Course is Lt. Col. John A. Bemis, U.S.M.C., who recently returned from operations on Guadalcanal. In addition to the director, the staff of the Field Artillery Course is being augmented by other officers returning from combat duty. All of the officer instructors are either graduates of the Field Artillery Course, Marine Corps Schools, or the Battery Officers Course, Field Artillery School, Fort Sill.

The Field Artillery Course is divided into three departments: Gunnery, Materiel, and Tactics. This division is chiefly for administrative purposes. Approximately 50% of the instruction is under the direction of the Gunnery Department.

The Field Artillery Course, along with most other service schools, is running on a block system. Under the present organization there are 3 concurrent classes. The course is 12 weeks in length. During this period the student officer spends an average of approximately 9 hours a day 6 days a week, either in the classroom or in the field. Approximately half of this instruction is practical, involving work in the field. Included in this schedule are night problems, night firing, and overnight field exercises.

The course is so arranged that the student first learns the theory of a subject in the classroom, next learns the practical operation or application on a small scale (such as the "Train-Board" or at the gun shed), and then moves into the field for actual firing. In this manner each subject is thoroughly covered before commencing a new one, and by the subject's being covered so thoroughly by both theory and practical instruction,

heretofore seemingly unrelated subjects are closely related and knit together as the instruction progresses.

Student officers are required to do all their studying and preparation outside of class periods. Time in the classroom is only long enough to clear up any doubtful points which may occur, and to introduce new material. Home work problems and instructional writs are constantly issued to the student officer to aid him in best utilizing his study time. Also, as a further aid to the student officers, voluntary study halls are conducted each night with instructors in attendance to aid any student who is finding difficulty with his studies.

Recently the Field Artillery Training Battery has been organized with a dual purpose of first, providing materiel and personnel to assist in the training of the student officers, and second, training enlisted personnel in field artillery duties. From time to time cadres are formed from this Training Battery and transferred to training centers to form new units. Needless to say, coordinating field artillery school troops with the training of the student officers has proven absolutely invaluable, from both the students' and instructors' viewpoint.

The weapons used in the Field Artillery Course are the 75-mm Pack Howitzer and the 105-mm Howitzer. Each student officer sees and works with each of these pieces. He is taught how to assemble and disassemble these guns, how to clean them, how they are oiled, and how to keep them in proper maintenance for immediate and continuous firing. Student officers learn by actually doing the work themselves.

Each student officer learns to fire the guns—and he actually fires them, acting as chief of section, gunner, and the different cannoneers. He is taught how to maintain properly the vehicles found in a field artillery organization, and to drive these different vehicles. Included in the driving instruction are special obstacle driving courses. He also must learn how to combat-load these vehicles effectively. He must learn about communications, and of these, especially the telephone and the radio. He actually lays the telephone wire during various communication problems. Also, the students learn to operate and make minor adjustments to telephones, switchboards, radios, and other communication equipment.

Student officers are taught to handle live ammunition and how to handle it under field conditions. Their instruction calls for them to compute ammunition transportation problems, ammunition allowances, and many other of the problems arising from ammunition supply difficulties.

Each student officer during this course of instruction performs,

at some time, practically all the duties that he may be called upon to do in a line outfit, or all of the duties that the men under his command may be called upon to do. During field exercises student officers are called upon to act as battery commanders, other battery officers, wire chief, members of the fire direction team, or other of the key duties of a battery organization. This is done in order to familiarize each with all the duties which men under him will be doing in the battery. A student officer may act as a battery commander in one problem, as a wire chief in the next, as a member of the fire direction team in another exercise, and so forth.

In addition, each student is given basic instruction in equitation, as at some distant place the Marine Corps field artillery officer might be forced to substitute animals for vehicles. Also included in the equitation instructional periods are classes devoted to the instruction and demonstration of the use of pack saddles for transporting field artillery weapons, ammunition, and equipment.

Firing is done in the new Guadalcanal Area of the Marine Corps Reservation of Quantico, Virginia. The range is of such terrain that observation post firing can be carried on as well as forward observer shooting. It is of such size that firing exercises, with displacements, can be held in this area.

Each Reserve Officers' Class, Marine Corps Schools, is given a number of lectures by Field Artillery instructors concerning the Marine Corps Field Artillery organization, tactics, and technique. This is supplemented by a demonstration battery "shoot" with either the 75-mm (Pack) or 105-mm Howitzer. It is hoped to indoctrinate each officer of the Reserve Officers' Class, who will be doing duty with weapons other than field artillery, with the value and use of field artillery. Furthermore, the instructor strives to teach each of these student officers of the Reserve Officers' Class the technique of calling for and adjusting field artillery fire, hoping that they will be able to do this should the necessity ever arise. One of the final problems of the Reserve Officers' Class and the Field Artillery Class is a joint overnight exercise, executed almost in its entirety by the student officers, of an infantry-artillery combat team in a tactical field problem.

Instructors of the Field Artillery Course also instruct in the Staff and Command Course, Marine Corps Schools. Here again, the organization, tactics, and technique of Field Artillery are brought before officers whose main duty will be with infantry units. The instruction in the Staff and Command Course is also supplemented by a demonstration battery "shoot." And also, as with the Reserve Officers' Class, the close coordination of the infantry-artillery combat team is emphasized.

Throughout the entire course of instruction special emphasis is stressed upon the "team" idea and the fact that field artillery

is only one part of this team. Close coordination between the infantry and the artillery and other arms is continually emphasized. This is not as difficult for the Marine Corps Officer to understand as it might initially seem, due to the fact that, as previously mentioned, all Marine Corps Officers are basically trained in infantry.

New methods of technique are constantly being taught to the students. Special emphasis is placed on the fire direction center, with speed and accuracy the keynote. Student officers act as each of the members of a fire direction team sometime during the course of instruction, and learn to perform, with speed and accuracy, all of the duties of a fire direction team.

Constant changes in exercises and problems are being made to bring a more realistic training to the student officers. They now fire overhead fire, they occupy artillery positions at night without lights, acting as forward observers they adjust fire, and they have many other class periods which are as realistic as possible under the circumstances. Even in the designation of targets, realism is sought. No more are targets designated as "Enemy machine guns in vicinity of that tree" or "Enemy infantry in vicinity of those woods," but rather it is now "Jap machine guns in vicinity of that tree" or "German infantry in vicinity of those woods."

In order to eliminate all periods of wasted time during actual instructional periods, a policy has been adopted of double timing between places of execution of the problems or assignments: when a class detrucks 500 yards from the place where it will go into action, it covers this distance "on the double." And if groups of officers are exchanging positions on fire control instruments, it is done on the double. Likewise on a survey problem, the distances between survey "set-ups" are covered at double time. This does not mean that the actual instruction is hurried, for it is not! This policy does mean that time used in getting from one place to another is shortened, thereby allowing more time for actual instruction. As might be imagined, this policy serves another purpose—that of keeping all officers in good physical condition.

Upon the successful completion of the course the student officers are assigned to duty with combat organizations of the Fleet Marine Force. They go to combat organizations either as replacements or to form new units. Officers graduating from the course are capable of acting as a battery executive officer, reconnaissance officer, motor officer, forward observer, or as a staff officer on a field artillery battalion staff.

They leave the school, not as polished, experienced field artillery officers, but rather as basically trained officers in the fundamentals of field artillery, able to capably perform their duties as battery officers in Marine Corps Field Artillery units. The mission is being accomplished.



*Quantico's range is typically Virginian. Student standing at left is firing.*



# SEEK AND YE SHALL FIND

By Lt. Paul Roberts, FA

Like many others throughout the country, we were in a new division. Men recently taken from civilian life and peacetime jobs were soon learning the tricks of a new trade. The serenity of what was but recently lazy farmland was broken by the stentorian voices of severe drill masters. When not drilling, basic military subjects were convincingly instilled in the mind of the recruit. Thus is a military unit born.

One plump member of our battery gave his instructors just cause for worry. During foot drills he wallowed blissfully along, eternally out of step with the rest. He had his own peculiar and intricate method of executing all movements. The severest tongue-lashing could not whip him out of route-step marching. In motor instruction this soldier seemed as good as, if not better, than the average, so our Motor Officer felt he was doing a magnificent job of reclamation when he made our problem-soldier a good truck driver. We all concurred.

When the battery went on its first overnight problem, our reclaimed driver was assigned to a truck hauling the officers' equipment. Late at night I passed by to pick up my gear, and found Ball (I shall call him Ball, for that is not his name) making a fine bough bed for himself. I sent him on errands to various sections scattered through the bivouac area. He found his way unerringly.

A little questioning revealed Ball to be an experienced woodsman who loved the open country. An excellent man to have in a reconnaissance party! Since then, each time the battery has been on a field exercise, Ball has been taught to evaluate terrain along military lines. Soon he was reconnoitering routes, and now he knows the requirements for a GP, bivouac area, and OP.

Ball's case set me to thinking. Why hadn't we known of this talent before? That information should have been on Form 20. Guiltily the thought arose that I had gone through all the Forms 20 hurriedly. That evening, with pencil and paper I made a thorough study of these forms. The results were enlightening.

One man had been a skilled painter, and only the day before we were casting about looking for a man to paint the day room.

Another was a former butcher. As I read this on his card, the fact that our battery was having some trouble in its mess suddenly flashed across my mind. The men were complaining about the scarcity and quality of the meat. Persistent inquiry revealed that only the best grade of meat was served. The next day, a short conversation with our butcher brought out some interesting notes on the cutting and serving of meat. He assured me that by the use of correct carving knives and proper cutting, extra steaks could be gleaned from a side of beef. A few days later I witnessed, with rare and extreme pleasure, the spectacle of a man who could not remember his General Orders skillfully and artfully converting a side of beef into the maximum number of tasty steaks.

The card of our Bugler-Messenger showed him to be a clarinetist. Apparently we had found his right job, but a personal interview with the man taught me a lesson. The clarinetist detested the bugle. The bugle is blown altogether

differently from the clarinet, and bugle blowing will ruin a man's lip formation for blowing a clarinet. A Form 20 search is an education in itself.

This last case illustrates the need for supplementing a Form 20 with actual personal questioning, just as one supplements a map study with an actual visit to the terrain.

One of our recruits proved to be an expert typist. Our best position for him would seem to have been battery clerk. However, this man was a former divisional sales manager with an interesting and successful background. His ability could be far more profitably utilized in a different branch of the service.

A careful consideration of these cases indicates that a good officer must be solely motivated by a burning, impersonal desire for maximum efficiency. The welfare of the entire unit is paramount. An officer who knows his technical work but neglects the problem of proper assignment of his men is in the same position as the football player who gains 5 yards but then allows the opposition to push 10 yards through his own weak guard.

No one intentionally neglects the problem of proper assignment of men, but through laziness or inadvertence the problem is often neglected. How many battery officers have made a complete study of all their Forms 20? How many have not even looked at them? The army has gone to great pains and has taken much time to furnish for each man a record of capabilities and talent. These records are easily accessible. To overlook them is a crime, to consult them is an education which bears much fruit. If this lesson were brought home to all parts of our large army, our efficiency could not help but be increased with the result that ultimate victory would come quicker and with a minimum of cost to us.

A Form 20 study is only the beginning of the job of knowing the capabilities of each man in the outfit. And it is the duty of the battery officer to thus know his men. Higher officers deal with maneuvers and tactics. It is the primary mission of the battery officer to carry out the orders of his superiors in the most expeditious and efficient manner possible. He must know who can and who can not do a specific job.

George Washington said, "In time of peace prepare for war." The converse is equally valid. After all, it is a certain condition of peace for which we fight. We must strive to build a peace which represents the ideals for which we fight, or we fight in vain. If we train a man well he will carry that training into civilian life when the army discharges him. Similarly, improper training might ruin a man and render him a perpetual burden upon society.

The battery officer's part in the moulding and building of future society is often overlooked. Many men coming into the army have been misfits in civilian life. Many have latent talents. By proper study, questioning, and observation, many apparently ineffective individuals can be made useful.

All this entails hard work, but the results more than repay the effort.

Our army presents an unusually golden opportunity for developing



# Training A Motorized Battery

The following description of a proposed method of training a motorized battery is based on the results of practical experience and is offered in the hope that the suggestions it contains may awaken reflection in the minds of those interested in the training of these newly formed units.

The training of a new motorized battery is divided into three courses of four weeks each; first, a course for the training of individuals and specialists; second, a course for groups and drivers; and third, a combat course for the battery as a unit. At the outset, the proper division of a newly formed motorized battery into groups for training purposes always causes a great deal of difficulty. The basis for the formation of these groups is found in the customary division of all units of our army into what are called "gruppe" in the infantry, and "sections" in the cavalry. Little definite advice can be given for this division since both the organization and the strength of the groups may vary greatly in different motorized batteries.

## *Course No. 1; for individual and specialized training.*

For each of the different kinds of specialists—drivers, gun layers, radio operators, telephone men, etc.—two classes are formed, one for beginners and one for advanced students.

A motor vehicle school for the training of the required number of drivers is started the very first day, and at least three drivers' classes of five pupils each operate in each unit at the same time.

From those being trained as gunners or ammunition men, twelve or fifteen are selected for training at the same time as machine gunners, so that in case there should be a shortage the battery itself can provide reserves.

Very special attention must be given to the training of radio operators in motorized batteries. With the rapidly moving action of tank and motorized units, radio is frequently the only possible means of maintaining contact and transmitting firing orders. If one were dependent on the telephone alone for fire control, orders would often fail to reach the firing position in time and proper coordination of fire between artillery and tanks would be impossible. Telephone connections are usually of use only when one has time beforehand to construct the lines very carefully. Where they are used on the field of battle, telephone lines must usually be elevated above the ground on poles, for motor vehicles of all kinds have to move about the field and where motorized units operate they continually put ground lines out of order. Disturbances of the lines will occur more frequently when tanks are moving over the field, and in cases where large numbers of tanks are operating in the area between artillery firing positions and observation posts, even well-constructed overhead lines will be disturbed, for the tank drivers either fail to see the poles or see them too late—and in the dusk or at night they cannot see them at all.

Frequent practice in hand grenade throwing is very important and each man in a motorized artillery unit must be given the necessary practice in this, for the hand grenade is the most effective weapon in close combat.

## *Course No. 2; for groups and drivers.*

In this course the battery is divided in three groups for those stages of training preliminary to combat training.

Group "A" is devoted to the training of drivers in the operation and care of vehicles on the march and during rest periods, in travelling across country, in stopping when moving in columns, in attaching and detaching guns from limbers, and in other group exercises. The instructor is the wagon-line commander assisted by a master sergeant, a supply sergeant, two NCO's of the ammunition columns, and other available NCO's. The equipment includes all suitable motor vehicles, the actual number to be governed by the number of previously-trained drivers available. On certain days which are determined by the battery commander—for instance, every other training day—the motor vehicles belonging to the battery headquarters detachment as well as those of the communications section are made available for the training of Group "A."

Group "B" is made up of the gun crews and ammunition men who are trained in gunnery practice (method of fire, fire discipline), aiming practice by day and also by night, camouflage and concealment, rifle troop service (close defense), machine-gun service, etc. The instructors are the battery officers, platoon and gun commanders, and a machine-gun NCO. The equipment employed consists of four guns and a machine gun. This group is occasionally taken into the country for training in cooperation with Group "A."

In Group "C," the battery headquarters detachment and communications section is given training and practice in maintaining cooperation between the various separate parts of the battery including the advance observer, in the maintenance of communications, and in plotting sections in the open country. The instructor is the observation officer. The equipment used includes all that which belongs to the battery headquarters detachment and the communication section, in addition to various types of vehicles placed at the disposal of the group whenever necessary, the types being determined by the practice assignment of the particular day. Occasionally reserves are engaged to take part in the exercises which from time to time are carried out in the open country.

In connection with Group "C," two subordinate groups are formed. The first is designed for the training of observation post personnel, assistant observers, plotters, drivers, and motorcycle dispatch riders. The instructor is an advance observer. The second subordinate group trains the entire personnel of the communications section, including the drivers of the vehicles

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A digest of an article in *Artilleristische Rundschau*, May, 1942. Translated from the German at the Command and General Staff School, Fort Leavenworth, Kansas.

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belonging to this section. The instructor is the commander of the communications section, but the observation officer is also responsible for the training of this group.

While Course 2 is being given it is well to have combat practice at least once a week with the battery as a unit, in order that the action of the various parts may become familiar to young recruits. The various groups also learn during these operations where defects and inadequacies exist and where individual training is not up to the proper standard.

*Course No. 3; combat training for the battery as a unit.*

In this course the battery is assembled in the form of a single unit for the purpose of war exercises which take into consideration the very mobile methods of fighting in tank units and motorized formations. A great deal of room is left for the imagination of the person planning and directing these exercises. A very definite purpose must be used as a guide in each exercise, and one should avoid undertaking too much.

In the training of the battery certain points must be stressed with respect to the use of the guns. The rapidity of action in the case of armored units and motorized divisions makes the employment of single guns more frequently necessary in open firing against bunkers or heavy tanks than is the case with horse-drawn units. The mobile type of combat, furthermore, frequently requires the engagement of single guns or whole batteries in open firing against the enemy who has succeeded in breaking through the lines. Direct fire is therefore more often necessary with motorized batteries, and the whole gun crew should be thoroughly trained in the rapid handling of guns. All NCO's must be carefully schooled in the rapid and correct solution of the combat problems of individual guns where fire control is entirely in their own hands.

Even though, as a rule, firing positions are chosen so that individual guns have a good field of fire at close range, this basic principle must be particularly observed in the case of motorized batteries, and these fields of fire should be good not only at short range but also at *very* short range. In combat between tank formations it may easily happen that an enemy tank which has lost contact with its own formation during the battle will suddenly appear in the vicinity of a firing position and attack the battery. Proper choice of firing positions is therefore extremely important, and this is the more true since it

is usually impossible to move the guns immediately into a more favorable position when an emergency arises like that just described.

Another point that must be emphasized is the necessity for the training of every man in the battery in close defense. In the tasks assigned to armored units and motorized divisions, it is frequently necessary to make deep thrusts into the enemy's positions without regard for the resulting threat to flanks. Assignments will often call for combat operations in the rear of the enemy. With the already existing shortage of rifle troops, who are usually badly needed in other places in as great numbers as possible, it is not always feasible to furnish strong security in all places in this type of combat. Each unit, therefore, must be prepared to furnish its own security, and in case enemy scouting detachments or tanks suddenly appear, it must be able to defend itself or, better still, to cut off the enemy's retreat.

Close defense under all circumstances—even under seemingly impossible circumstances—must be practiced constantly by motorized batteries. The various types of close defense are of importance not only to firing positions but also to observation posts and limber positions. Accordingly these exercises must be assigned to all parts of the battery, for it is only through much practice that one can train his men to find the proper solution for his type of problem.

All types of problems relating to security must be worked out in a most thorough manner, for instance the security of resting areas, village camps, billets, etc., particularly, however, the form of defense known as circular defense which is frequently adopted by motorized formations in uncertain situations.

Finally, it should be emphasized that, under the conditions of modern war, the close-range observation post within calling distance of the firing position, or at least near enough for the use of visual signals, is of increased importance to the motorized battery. Such close-range observation posts are frequently occupied by machine-gun men prepared to guard the firing position against air attacks. If this is the case an NCO must be assigned to the post as an observer and his task will be one of utmost importance, requiring of him independent decisions for which special training is essential.

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### **FIELD ARTILLERY GUIDE—*What they say about it:***

"I consider this an excellent publication—compact and excellent source of information for the Field Artillery Officer. I recommended it to each of my officers."—BRIG. GEN., USA

"I am sure this compact reference book will be very valuable to me. It is extensively used in this division."—BRIG. GEN., USA

"Enclosed is my check for a copy of the *Field Artillery Guide*. I have seen copies of it in use and it is now definitely on my 'must' list. Please send it as soon as possible."—1ST LT., FA

# Not in the BOOK

EDITOR'S NOTE: This feature is devoted to ideas sent in by our readers describing methods or devices which, though not specified by official literature, have proved useful in service.

## FDC FORM

Each computer at battalion FDC must keep certain records for his own use; he also keeps data for S-3. Records should be kept of fires conducted by the battery between battalion concentrations. Both battery and battalion benefit if their FDCs exchange their adjusted data.

The regular computer chart has too little space and is not properly arranged to take all of this information. I therefore made up the accompanying form which has proved very useful in keeping all information straight. It is maintained, substantially in duplicate, by each battery's FDC and its computer at battalion FDC.

This specimen form indicates that Battery Affirm registered on a battery base point (A200), and reported to battalion FDC its battery front, minimum elevations, rounds in battery, and adjusted data. A different Bn BP was thereafter selected, and Battery A registered upon it. (Thereafter all data refer to the battalion base point—the earlier battery one is discarded for all purposes.) This adjusted data and all subsequent adjusted data were reported to battalion FDC. Adjusted data of all battalion concentrations were reported by battalion to the battery FDC for plotting on the battery chart.

Result: all significant information is immediately available at any FDC, by glancing at a single sheet per battery.

S/SGT. ERIC WALDMAN

*Affirm*

Charge	1	2	3	4	5	6	7	Rounds in battery				
Battery								20	20	20	20	20
Reg. No.	61	58	54	50	46	40	37	182	74	12		
Date	200 Yds.		6 Guns in Btry					93	38	0		

Battery Form		
A 200	Adj. Co 3655	Adj. Bn. 6680 Yds.
Bn BP 200	Adj. Co 3650	Adj. Bn. 6200 Yds.

Concentration	Adj. Data		Rds. Used	Nature of Target	Rds. Left in battery				
	Bn	Strg			Deflect.	Range	20	20	20
							182	74	12
Bn 200	A 200	6200	0	BB			176	74	12
Bn 201	R 350	5920	18	TT			158	74	12
Bn 202	L 120	6130	24	AT			134	74	12
	A 201	5960	120	TT			134	62	12
	A 202	5800	9	AT			125	62	12
Bn 203	L 250	6150	24	TT			101	62	12
	A 203	6040	12	AT			89	62	12
	A 204	6000	240	TT			89	36	12

## AIMING DEVICE FOR 37-MM AT GUN

**PURPOSE:** To enable an instructor to check the aiming and tracking of the antitank gun. It can also be used to permit the pupil to observe a correct sight picture while the instructor manipulates the weapon.

**CONSTRUCTION:** Details of construction are clearly shown by the attached drawing; the device is so inherently simple that a lengthy word description is not necessary.

The glass used was obtained from the frame of a 10c pair of sunglasses and was found admirable for the purpose. It was unnecessary to cut or trim the glass in any way.

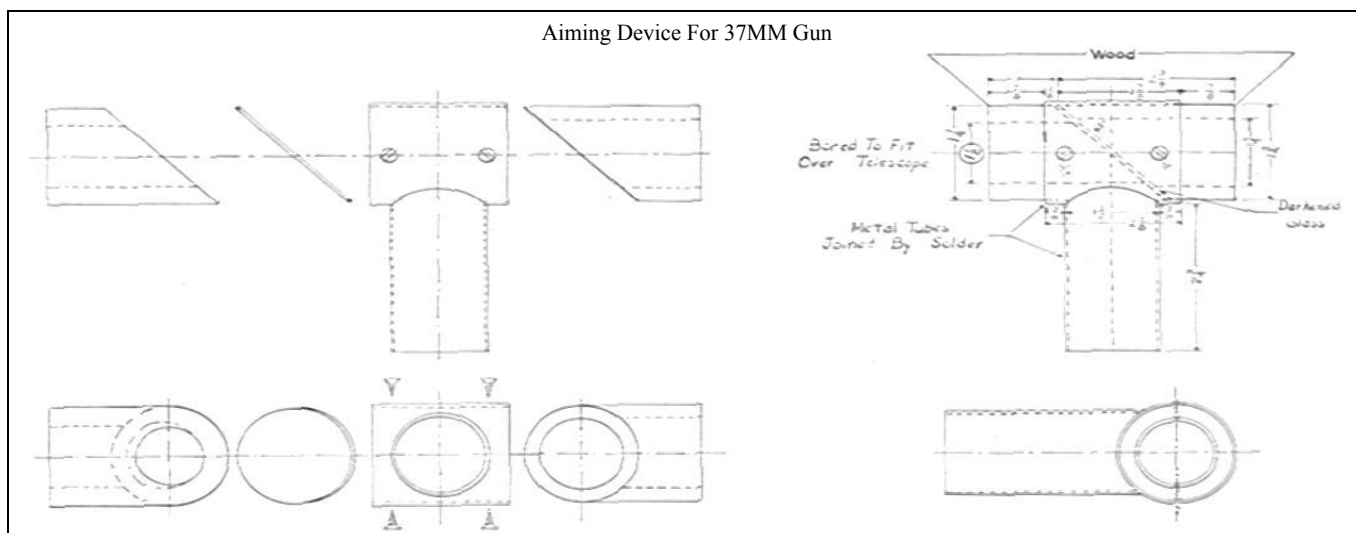
As can be seen from the drawing, the darkened glass is held in position by the two wooden tubes at an angle of 45°.

That section of the wooden tube which is to fit over the telescope has been so bored as to secure the aiming device when mounted in place.

**USE:** When the device is positioned over the rear end of the telescope it will cause images in the field of view to be reflected into the vision of the instructor. There is little interference with the gunner's view if the light is good. It has its disadvantages when used on a dull day or when the target is very far.

**NOTE:** The aiming device described above is by no means original. It has been improvised in lieu of the Aim Checking Device, M1, which has never been issued. This latter device is described in FM 23-70, Par. 29.

LT COL. PAUL. B. BELL, Fa



# Diary of War Events

(As Reported in the American Press)

## MAY, 1943

- 1st Allies continue advances in Tunisia; British and American fliers destroy Axis shipping in Mediterranean. Coast Guard cutter *Icarus* sinks U-boat off Carolina coast, captures 2 officers and 31 members of the crew. U.S. bombers raid U-boat base at St. Nazaire.
- 2nd Allies gain nearly all the high ground that has blocked drive on Tunis.
- 3rd U.S. troops capture Mateur, other Allies gain ground toward Tunis.
- 4th Allies close in on Bizerte from both sides. U.S. heavy bombers raid Antwerp. Lt. Gen. Frank M. Andrews (commanding U.S. Forces in the European theater) and Bishop Adna W. Leonard (head of the Army and Navy Chaplains) are killed in Iceland plane crash. U.S. subs sink 6 Jap ships. RAF bombers raid Ruhr city of Dortmund.
- 5th Allies push forward as Axis shows signs of withdrawing from Bizerte.
- 6th British capture Massicault, Americans break through to a point 8 miles from Bizerte. Lt. Gen. Jacob L. Devers, Chief of the Armored Force, is appointed commander of the European Theater of Operations.
- 7th Tunis and Bizerte fall to British and Americans, after an unparalleled aerial blitz that plastered virtually every yard of Axis-held area. Washington reports that U. S. forces occupied Aleutian island of Kamchatka Jan. 12, 1943, putting troops within 71 miles of Jap base at Kiska.
- 8th British armored forces pierce last position held by Axis survivors in Tunisia. French units capture Pont du Fahs. Chinese repel Jap landing forces on Tungting Lake in northern Hunan province.
- 9th 50,000 Axis prisoners (including 4 German generals) captured between Friday and Sunday. 400 U.S. planes "wipe-out" a square mile of Palermo (Sicily) harbor and industrial area.
- 10th Fighting continues on the approaches to Cap Bon peninsula in Tunisia. Allies continue to bomb island of Pantelleria, and Messina in Sicily.
- 11th Prime Minister Churchill arrives in Washington for 5th war conference. Some 200 U.S. bombers and 100 fighters raid Marsala, Sicily. Axis troops continue to surrender in droves in Tunisia. Russian troops continue slight advances. U.S. troops by-pass Kiska, land on Attu further west. Attack is double: Holtz Bay on north of island, Massacre Bay on south.
- 12th War in Tunisia ends; capture of 150,000 prisoners since May 5th is announced.
- Russia continues on the offensive around Novorossisk.
- 13th British, American, and Russian air forces raid various Nazi positions; Duisburg, Meaulte, and St. Omer are principal targets. Riots, reprisals, strikes, and sabotage against the Axis in occupied countries are reported.
- 14th General MacArthur and Admiral Halsey in joint conferences.
- 15th U.S. bombers raid Nazi naval base at Emdem. RAF raids France. Aircraft offensive continues over Italy.
- 16th RAF bombs Berlin, Germany retaliates with raid on London.
- 17th RAF attacks and breaks 2 big German dams in Ruhr. U.S. bombers raid Lorient harbor.
- 18th U.S. troops close in on Japs' positions at Holtz Bay on Attu. U.S. bombers raid Wake Island.
- 19th Prime Minister Churchill assures Congress of British aid in destroying Japan, but stresses the importance of defeating Germany first. U.S. troops close the pincers on the Japs in Attu.
- 20th Allied bombers in North Africa make heavy raids on Italy, destroy 113 enemy aircraft. Americans in mopping-up stage on Attu. U.S. fliers pound Jap supply lines in Central Burma.
- 22nd Moscow announces dissolution of Communist International (the Comintern). Red Army shoots down 44 Nazi planes in raid over Kurst. Allies destroy 285 planes in Sardinia and Sicily, lose only 12. Heaviest air raid of the war delivered by RAF on Dortmund.
- 23rd Flying Fortresses pound Borizzo airfield in Sicily. Nazis raid southeast England.
- 24th Allied aircraft active over Italy's outposts. 6 U.S. Army Lighting fighters take on 16 Jap bombers, shoot down 5.
- 25th U.S. planes bomb Sardinia, and Reggio Calabria in Italy. Japs in China advance west of Ichang, toward Chungking. Slight fighting continues in Attu; U.S. troops advance.
- 26th Allied air activity continues over the Mediterranean. U.S. troops clear out three pockets of Japs on Attu.
- 27th American bombers continue raids on Sicily, Sardinia, and Pantelleria.
- 29th Large U.S. bombers raid Nazi-occupied France, Flying Fortresses strike at St. Nazaire and Rennes.
- 30th Bad weather on Attu holds up air support for ground forces; Navy reports one pocket of Japs still resisting. RAF raids industrial center of Wuppertal.
- 31st 100 Flying Fortresses give Naples heaviest daylight raid of the war. U.S. raids in Western Europe during May destroyed 351 Axis planes; we lost 81. James F. Byrnes appointed Director of War Mobilization.



## *For Heroism and Service*



### SILVER STAR

BRIG. GEN. CLIFT ANDRUS, for gallantry in action. An enemy breakthrough occurred where units, prepared to defend and counterattack in force, had been placed. When this breakthrough occurred, enemy infantry elements overran two batteries of an artillery battalion. Gen. Andrus, at grave danger to his life, personally assisted in the reorganization of various elements of this artillery battalion and so skillfully disposed adjoining artillery elements that this enemy attack was completely broken down. Address, Schofield Barracks, Territory of Hawaii.

PVT. 1ST CLASS JOHN S. BARRY, USMC, for gallantry in action on December 26, 1942 on Guadalcanal. Pvt. Barry was pinned to the ground by machine gun and rifle fire while accompanying advance infantry elements to obtain observation well forward. Pvt. Barry and two others, voluntarily and in complete disregard of their own safety, succeeded in evacuating a wounded man whom the stretcher bearers were attempting to evacuate. Address, 4412 Canal St., New Orleans, La.

1ST SGT. JAMES D. BURNS, for gallantry in action in Tunisia. The position was attacked during the morning by German Pz. Kw. IV tanks and infantry. When the gunner of the first section gun was blown from his position and the cannoner knocked down, he, with enemy mortar shells falling on and around the gun position, ran to the gun and loaded and fired the piece until the ammunition was expended. Address, 2654 Irving Ave., North Minneapolis, Minn.

1ST LT. RICHARD D. BUSH, for gallantry in action. He was the forward observer for a tank battalion. In working his way well forward so that he could observe to better advantage and more effectively direct the fire of his own artillery, he completely disregarded his own welfare by remaining at his post while under very heavy enemy artillery fire. He was also well within the impact area of his own artillery fire. When it began to get dark he again worked his way forward to a position between the enemy and our most advanced troops so as to adjust the artillery fire after dark. Address, 828 Belmont, Flint, Mich.

CPL. FRANCIS W. CAJUNE, for gallantry in action in Tunisia. During the day the section Cpl. Cajune was with was constantly harassed by artillery fire, and later in the day was bombed and strafed by enemy aviation and at night by machine gun fire. During the activities of the day the section truck had mired down and later in the afternoon the supporting troops had moved. Rather than abandon the truck as well as the gun and ammunition, Cpl. Cajune, with two privates, succeeded in winching out the truck and pulling the gun back to safety. Address, 1522 3rd St., North Minneapolis, Minn.

SGT. DAVID R. CLARK, for gallantry in action. His battery was suddenly attacked by an enemy force of tanks, mechanized infantry, and antitank guns. In withdrawing from the area, his vehicle became stuck in a marsh. When the driver was unable to extricate it, and all the crew left, he got in the vehicle and under heavy enemy fire drove it out of the marsh. The vehicle then received a direct hit from an 88-mm antitank gun and shortly thereafter another one which set the vehicle afire. He continued to try to bring the vehicle to safety. A third direct hit from an antitank gun finally stopped the burning vehicle, knocking

him out of it. He was then forced to abandon the vehicle. Address, Hardinsburg, Ky.

PVT. WILLIAM CLEVINGER, for gallantry in action in Tunisia. Under heavy German shell fire, one of the howitzers received a direct hit which killed a member of the crew, wounded several men, ignited a number of powder charges, and set fire to a box of hand grenades. Pvt. Clevenger, together with an officer and four enlisted men, extinguished the fire in the box of hand grenades with water and shovels even though there was danger of the box exploding. Address, Madrid, Iowa.

PVT. CARL E. CONINE, for gallantry in action in Tunisia. During the day, the section Pvt. Conine was with was constantly harassed by artillery fire, and later in the day was bombed and strafed by enemy aviation and at night by machine gun fire. During the activities of the day the section truck had mired down and later in the afternoon the supporting troops had moved. Rather than abandon the truck as well as the gun and ammunition, Pvt. Conine, with a non-commissioned officer and another private, succeeded in winching out the truck and pulling the gun back to safety. Address, Fostoria, Ohio.

PVT. 1ST CLASS HERBERT E. DE GRAND, for gallantry in action in Tunisia. The position of the battery was attacked during the morning by German Pz. Kw. IV tanks and infantry. In the afternoon the battery ran short of ammunition. This information was sent to the ammunition dump 700 yards away, and Pvt. DeGrand immediately started forward to the gun positions with the ammunition truck and despite heavy barrage of enemy fire drove the truck into the position, thus enabling the battery to continue firing. Address, R. R. 1, Box 209, Racine, Wis.

PVT. ANTHONY FRASCATORE, for gallantry in action in Tunisia. During the day the section Pvt. Frascatore was with was constantly harassed by artillery fire, and later in the day was bombed and strafed by enemy aviation and at night by machine gun fire. During the activities of the day the section truck had mired down and late in the afternoon the supporting troops had moved. Rather than abandon the truck as well as the gun and ammunition, Pvt. Frascatore, with a non-commissioned officer and another private, succeeded in winching out the truck and pulling the gun back to safety. Address, 2010 W. Cayuga St., Philadelphia, Penna.

1ST LT. ROY W. GARVIN, USMC, for gallantry in action on December 26, 1942 on Guadalcanal. Lt. Garvin with others was pinned to the ground by machine gun and rifle fire while accompanying advance infantry elements to obtain observation well forward. Lt. Garvin and two others, voluntarily and in complete disregard of their own safety, succeeded in evacuating a wounded man whom the stretcher bearers were attempting to evacuate. Address, 500 S. Sparton St., Ruston, La.

PVT. HARRY G. GRIESE, JR., for gallantry in action in Tunisia. Under heavy German shell fire, one of the howitzers received a direct hit which killed a member of the crew, wounded several men, ignited a number of powder charges, and set fire to a box of hand grenades. Pvt. Griese, together with an officer and four enlisted men, extinguished the fire in the box of hand grenades with water



and shovels even though there was danger of the box exploding. Address, 771 Carroll St., Baltimore, Md.

PVT. 1ST CLASS ARTHUR L. HOLMES, USMC, for gallantry in action on December 26, 1942 on Guadalcanal. Pvt. Holmes was pinned to the ground by machine gun and rifle fire while accompanying advance infantry elements to obtain observation well forward. Pvt. Holmes and two others, voluntarily and in complete disregard of their own safety, succeeded in evacuating a wounded man whom the stretcher bearers were attempting to evacuate. Address, Taylor, Nebr.

SGT. ROBERT L. KENNEDY, for gallantry in action in Tunisia. The position was attacked during the morning by German Pz. Kw. IV tanks and infantry. After a constant shelling of the position throughout the day by the tanks and infantry mortars, the fourth section gun was moved into position for direct fire. When the mortar fire became too intense Sgt. Kennedy ordered his cannoneers to their trenches, but he remained in the position, loading and firing the gun alone and scoring several direct hits on the tanks. Address, 4020 20th Ave., South Minneapolis, Minn.

CPL. VERNON D. MCHARGUE, for gallantry in action in Tunisia. Cpl. McHargue, in a small vehicle with a wire repairing detail, of necessity entered a zone in plain view of the enemy and under constant infantry mortar fire. Having located the wire break. Cpl. McHargue with another enlisted man dismounted and ordered the vehicle under cover. Two mortar shells fell, knocking down Cpl. McHargue, who, unhurt, called to his companion, receiving no reply. An officer in a near-by entrenched artillery observation post ordered him to take cover in the observation post. He obeyed the order and then at his own volition returned at once, in full view of the enemy, to the body of his companion. Only after ascertaining that his companion had been instantly killed did he return to shelter. Address, R. R. I. Lovett, Fla.

S/SGT. EDWARD H. MEYERS, for gallantry in action in Tunisia. Under heavy German shell fire, one of the howitzers received a direct hit which killed a member of the crew, wounded several men, ignited a number of powder charges, and set fire to a box of hand grenades. Sgt. Meyers, together with an officer and four enlisted men, extinguished the fire in the box of hand grenades with water and shovels even though there was danger of the box exploding. Address, 1420 4th St., Boone, Iowa.

CAPT. QUENTIN ROOSEVELT, for gallantry in action. As artillery liaison officer for an infantry battalion Capt. Roosevelt voluntarily pushed forward under heavy enemy machine gun and mortar fire and secured an observation post well in advance of the leading elements of this battalion. Capt. Roosevelt remained at this post and directed well-placed artillery fire upon enemy strongholds, thus enabling the infantry to seize its objective. Address, Oyster Bay, N. Y.

PVT. ANDREW J. SAVINO, for gallantry in action in Tunisia. While manning a .50-caliber machine gun in the battery defensive position, Pvt. Savino, until hurled to the ground by a large bomb, continued firing at enemy planes which circled in the sun and bombed and machine gunned the area. Address, 901 E. 167th St., Bronx, N. Y.

LT. COL. CHARLES P. SUMMERALL, JR., for gallantry in action. While the combat command of which his battalion was a part was being forced back by a greatly superior enemy force, Col. Summerall with complete disregard for his own welfare remained forward with his artillery, personally directing its rearward displacement. During this time he was continuously subjected to heavy enemy tank, artillery, and machine gun fire, also to attack by enemy aircraft. His efficient and untiring efforts were instrumental in making possible the withdrawal of troops from this area. Address, 44 Willard Ave., Phoebus, Va.

1ST LT. JOHN F. WALTER, for gallantry in action in Tunisia. Under heavy German shell fire, one of the howitzers received a direct hit which killed a member of the crew, wounded several men, ignited a number of powder charges, and set fire to a box of hand grenades. Lt. Walter, together with five enlisted men, extinguished the fire in the box of hand grenades with water and shovels even though there was danger of the box exploding. Address, 254 Ward St., Ottumwa, Iowa.

CPL. JOSEPH E. WHITE, for gallantry in action in Tunisia. Under heavy German shell fire, one of the howitzers received a direct hit which killed a member of the crew, wounded several men, ignited a number of powder charges, and set fire to a box of hand grenades. Cpl. White, together with an officer and four enlisted men, extinguished the fire in the box of hand grenades with water and shovels even though there was danger of the box exploding. Address, 902 Grant Ave., Waterloo, Iowa.

CPL. RICHARD F. WOOLERY, for gallantry in action in Tunisia. Under heavy German shell fire, one of the howitzers received a direct hit which killed a member of the crew, wounded several men, ignited a number of powder charges, and set fire to a box of hand grenades. Cpl. Woolery, together with an officer and four enlisted men, extinguished the fire in the box of hand grenades with water and shovels even though there was danger of the box exploding. Address, Elmore, Minn.

#### Oak Leaf Cluster, Silver Star

BRIG. GEN. THEODORE ROOSEVELT, for gallantry in action. When enemy forces began a savage counterattack on our positions, Gen. Roosevelt proceeded immediately to a forward observation post subjected to particularly intense enemy artillery fire, strafing, and furious dive-bombing, returning to the division command post only when the enemy threat had been dispelled. Address, Oyster Bay, N. Y.

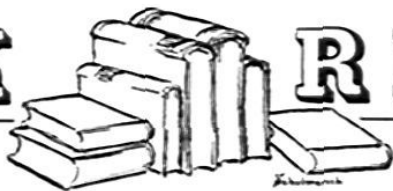
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#### ASSOCIATED ARMS

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# BOOK REVIEWS



*PARATROOPS.* By Maj. F. O. Miksche. Random House, 1943. 254 pages; index; illustrated, \$2.50.

A bit over a year ago we heard rumors of an English-published book that was reputed to be a detailed and profound military study. *Blitzkrieg*, it was called, and its author was a Czech officer, one Miksche. In due course it was published here under the title *Attack*,\* and was found to be all earlier reports said—and more. Unexcelled for clear thinking and plain statement, its sheer merit ensconced it in that high niche reserved for few books on any subject.

Now we have the first sane, clear, and comprehensive analysis of the use of airborne troops—and the defense against them. True, its title is as "popular" or "catchy" as that of the British edition of Miksche's earlier work, but its content is as solid and "meaty." Again Miksche is specific as to what he feels should be the organization, equipment, technique, and tactics. Not didactic, he gives the *whys* as well as the *whats* and *hows*, and backs them up with both sound logic and historic examples that pound home his truths.

In only one major respect do I disagree with his conclusions. It's not a thorough disagreement, for there are arguments in favor of his view—and at the same time he isn't altogether sold on it. Maj. Miksche advocates landing glider-borne troops by parachute. In days when demand for airborne troops is inevitably drawing nearer, there must be speed in training—and no nation possesses time or facilities for such mass parachute training. "Economy of force" applies in training as well as in actual combat; airborne forces can be expanded fastest, of course, by providing plane or glider "chauffeurs" from a country's air forces. But as I say, Miksche does not belabor the point.

Written in German, *Paratroops* suffers a bit (in smoothness) from translation. More careful editing would have been desirable, and general readers may wish that British terms and abbreviations had been transposed into their American equivalents. But these are small faults, especially when contrasted with the solid worth of the book.

*Paratroops* is a most unique product—a book of value and interest to the airborne soldier, the military in general, and also the civilian who wants to know what these airborne outfits are all about.

\*Random House, 1942; \$2.50. See pages 410 (May) and 730 (September) of this JOURNAL for 1942.

*GERMANY'S MASTER PLAN.* By Joseph Borkin and Charles A. Welsh. Duell, Sloan and Pearce, 1943, 339 pages; bibliography; index. \$2.50.

This book conveniently summarizes the various economic sides of Germany's master plan of world conquest, but it doesn't tell how the Germans have correlated the economic side of the plan with the military or political. If you are looking for a popularly written and not always accurate account of Germany's economic plans for world conquest this book makes interesting reading, but you won't find the overall picture, suggested in the title, of what Germany is trying to do and how it is trying to do it.

With almost no new material except some vague conclusions, this book rounds up all the inside stories on cartels, trusts, and pools that have appeared, for example, in Carleton Beals' *The Coming Struggle for Latin America*; Sayers and Kahn's *Sabotage*; Spykman's *America's Strategy in World Politics*; Englebrecht and Hanighen's *Merchants of Death*; Reimann's *Patents for Hitler*; the reports of the Bone and Truman Committees in Congress; and various other books, magazine and newspaper articles. It is a convenient compendium of international skullduggery and big business knavery. It is not to be particularly trusted insofar as some of its facts and figures are concerned. For example, it credits to Ziff's *Coming Battle of Germany* the figures on "Percentages of Axis Control of World Production." Ziff, I found on checking back, apparently obtained the figures by "intuition," since he doesn't quote any source or authority for them. Other pertinent conclusions are similarly based on unreliable or unproven secondary sources, like Curt Reiss's *The Self-Betrayed*.

Thurman Arnold has written an enthusiastic introduction and Walter Winchell is plugging the book on the air, so it will undoubtedly be a big seller. If you are interested in keeping up with the best sellers, read *Germany's Master Plan*. If you are interested in factual and balanced accounts of the events leading up to World War II you had better try another book.

R. G. M.

*VICHY: TWO YEARS OF DECEPTION.* By Leon Marchal, 244 pages; index. The Macmillan Co., 1943. \$2.50.

The most notable characteristic of this survey of the political history of France since June, 1940, is its restraint. While in a position

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to divulge much "inside" information, Mr. Marchal scrupulously refrains from doing so. Although he equally refrains from extremes of opinion, he does not hesitate to judge.

Sobriety and factual content give weight and authority to this work. It is by no means a chronological or detailed survey of recent French history, but rather a commentary on the most important issues and most influential men of the Vichy regime. Petain, Laval, Darlan, and Weygand—each receives a chapter.

To American readers the section on Weygand, contradicting the newspaper evaluations, will be most illuminating. While the author remained in the diplomatic service of Vichy until April, 1942, he apparently feared from the beginning that France had no hope for independent action under the German armistice terms. The return of Laval convinced him that Germany was merely using France as a tool in her political warfare, and he resigned to join De Gaulle. His analysis unfortunately could not touch upon the political situation in Africa after November, 1942.

H. A.

*RETREAT WITH STILWELL.* By Jack Belden. Alfred A. Knopf, 1943. 368 pages; map. \$3.00.

Not merely what its title states, this is a first-hand account of the whole withdrawal from Burma. A long-time newsman in China, Belden was with the fighting forces every inch of the way from Rangoon to India.

His tale is epic. He clarifies the whole confused campaign, of which we had only fragments of news at the time. Hunger, thirst, fear, looting, treachery, heroism, grimness, faiths kept and faiths broken—these things plus uncertainties, betrayals, and vision are his subjects. "Little people" and "big people" come and go; and of the latter, only Stilwell himself and Dr. Seagrave seem to have Belden's full approval; other local notponchers he viewed as literal big-wigs.

Minor this campaign may be to some historians. Certainly, it involved but a small fraction of the forces engaged in Russia or Libya. But "minor" it is not, in significance or importance, for here the white man's power and prestige in the East took as terrific a beating as did the troops themselves. We are fortunate to have so clear and graphic an account of this campaign. *Retreat with Stilwell* is deservedly a national best-seller.

*CALCULUS MADE EASY.* By Silvanus P. Thompson, F.R.S. 301 pages. The Macmillan Company, \$2.00.

Here at last is a text book for all who have a desire to master calculus. The book is written in plain comprehensive language which even the beginner, without any advanced knowledge of mathematics, can understand. The author has included numerous simplified examples and illustrations that clear up any doubt in the reader's mind as to the solution. The exercises at the end of most chapters, if worked, will contribute immensely to the reader's knowledge of the principles used by the author.

Don't confuse this book with one of elementary mathematics. It is a book on calculus from beginning to end, but greatly reduced to simplicity rather than complicated teaching. With a little concentrated study, calculus can pretty well be mastered from this book.

It is with the above thoughts that I most heartily recommend *Calculus Made Easy* to join your other text books.

B. H. W.

*THEY CAME AS FRIENDS.* By Tor Myklebost. Doubleday, Doran & Co., Inc. 297 pages. \$2.50

The attack and final surrender of Norway is vividly described in this little book. It tells how all German encroachments have met with resistance, and how the Norwegian people have made it their duty to overthrow Nazi power. The author gives an authentic account of how Hitler has used Norway as an experimental field for National Socialistic ideas and how, when promises of great benefits met with defiance, his methods shifted to extreme terror and torture.

M. K. W.



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*THE GULF COAST OF MISSISSIPPI*, By Nola Nance Oliver. Hastings House. 105 pages; photographs. \$2.00.

Thousands of officers and enlisted men have been stationed near our Gulf Coast, close enough to it and for a long enough time to become acquainted with it and to learn to love it. The seven flags that have flown over this countryside have left historical associations in architecture, legend, and the local mode of life. These things have been delightfully captured by the camera and assembled into a book unsurpassed for recapturing the scenes for your memory, or for passing them on to friends and family. Yes, this volume can serve two purposes—it is splendid as a personal refresher, and ideal as a gift.

*SQUADRON 303*. By Arkady Fiedler. Roy Publishers. 182 pages; illustrated. \$2.00.

This book takes you along with the Polish aviators, flying with the R.A.F. If you have a large imagination you can almost feel that you are personally flying one of the Hurricanes in a fight-to-the-death with the Germans, so vividly are these combats described.

These Polish boys accounted for 117½ Germans shot down in September, 1940. Their heroism and courage cannot be disputed. Tenacity, which is as deadly a weapon as a gun, is their slogan.

For anyone who is air-minded, this book has thrills galore.

M. K. W.

*OPPORTUNITIES IN THE ARMED FORCES*. By Maxwell Lehman and Morton Yarmon. The Viking Press. 418 pages. \$2.95.

Covering the Army, Navy, Marine Corps, Coast Guard, Merchant Marine, and Civil Aeronautics, this is quite a comprehensive book. Besides commissions, it deals with opportunities in the ranks—special gradings, ratings, pay, and the like. Although highly interesting to and quite useful for those already in the Armed Forces, details of such opportunities change so rapidly that this book is of perhaps greatest value to those still in civil life. You and your family will find it mighty interesting, however.

*ICELANDIC POEMS AND STORIES*. Edited by Richard Beck. Princeton University Press, 1943, 315 pages. \$3.00.

In this series of translations from modern Icelandic literature we gain a fine insight into the character of the Icelandic people, as well as an understanding of their day-to-day life. Always exhilarating, sometimes lusty, these selections range from simple narratives of simple people to stirring tales of humor and adventure. The very spirit of the people is caught by the writers—and equally important, it is held by the translators. This anthology should appeal particularly to those whose friends or relatives are stationed there.

*DYNAMITE CARGO: Convoy to Russia*. By Fred Herman. The Vanguard Press, 1943. 158 pages. \$2.00.

An occasional air photo of far-flung ships, or a survivor's brief account in a newspaper—these have given us most of our little knowledge of convoys and how they work. But now a merchant seaman comes forth with a coherent, connected story of one of the largest convoys to Archangel. He was with that convoy; he lived it, breathed it, and was part of it. He knew it intimately, first as seaman on a vessel which was torpedoed in the North Sea, then as a hand aboard the cruiser to which survivors were transferred. Here there was action a-plenty, for subs, Stukas, and high-level bombers all tried to put this convoy leader out of action. Many merchantmen went down, but the convoy did get through. The details of "how" make fascinating reading.

J. W. T.

*MILITARY SKI MANUAL*. By Frank Harper. 387 pages; bibliography; illustrated. Military Service Publishing Co., 1943. \$2.00.

Abundantly illustrated with photographs, this is a grand book for anyone interested in skiing for sport, skiing in the army, or the whys

and wherefores of ski-troops. Ski-troop tactics and organization, bivouacking in the snow, rations and dietetics, and equipment—these comprise nearly half the book. Mr. Harper has a fine background on which to draw for his material on skiing instruction—and his Swiss experience makes the chapter on "Safety in the Mountains" thoroughly authentic. The picture is rounded out by highly interesting accounts of the operations of ski-troops in World Wars I and II. In short, the book is useful for troops in cold climates, and should provide interesting *divertissement* to those in the tropics.

*SECOND LIEUTENANT'S HANDBOOK.* By *Lieut. John R. Craf.* *Stanford University Press. 194 pages. \$1.00.*

So far as this reviewer was able to determine, this book covers just about all the essential things a newly commissioned officer should know. It is impossible to review it completely because of its great wealth of pertinent data, detailed information, and illustrations.

Just take this reader's suggestion and equip yourself with this book before or after you get your bars. You won't be sorry!

B. H. W.

*WHAT THE CITIZEN SHOULD KNOW ABOUT SUBMARINE WARFARE.* By *David O. Woodbury.* *W. W. Norton and Company, Inc. 231 pages. \$2.50.*

Norton and Company is furnishing the citizen a valuable and timely work in its "What the Citizen Should Know" series. *Submarine Warfare* is among the most readable and informative efforts. It is intelligently written, is logical, clear, and interesting. Historically and factually true, it adds another worthwhile book to the Citizen Series.

A. V. R.

*COMPREHENSIVE SMALL ARMS MANUAL.* By *Charles T. Haven.* *155 pages; bibliography. William Morrow & Co., 1943. \$1.50.*

This little handbook is of particular value to State Guard and other security units which are now armed with a great variety of weapons, many of which are so out-dated for regular army use that

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M. K. W.

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1921	x	x	x	x	x	x	1913	1920
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1923	x	x	x	x			1916	1922
1924					x	x	1917	1927
1925		x			x		1918	1929
1926	x	x	x	x	x	x	1924	1930
1927	x		x				1926	1931
1929	x	x	x	x	x	x	1929	1932
1930	x	x		x	x	x	1942	1934
1931	x	x	x	x	x	x		1937
1932	x	x	x	x	x	x		1942
1934	x	x		x		x		
1937	x	x	x		x	x		
1938		x		x	x	x		
1939	x	x	x					
1940	x	x	x		x	x		

### MONTHLY ISSUES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1941			x		x	x	x		x		x	x
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good descriptions are hard to find. Mr. Haven, a technical assistant with Johnson Automatics, Inc., has a good practical background of this subject. He discusses problems and possibilities, including the desirability of various types of weapons, safety measures and shooting instructions; military type rifles; sporting rifles; shotguns, sub-machine guns; pistols and revolvers; ammunition; knives and rough and tumble; and general firearms tactics. His lucid descriptions are well illustrated by photographs, drawings, and tables. The bibliography will help lead you to wider fields.

B. H. W.

*THE WISDOM OF CHINA AND INDIA. Edited by Lin Yutang, Random House, 1104 pages. \$3.95.*

Indian and Chinese civilizations considerably antedate those of the Western world. Their philosophers, poets, and moral leaders anticipated those we think of as our own. This rich field has been little known to Occidentals, yet its literature is as fine as ours. Lin Yutang has brought together in one volume the best of the sacred books of Hinduism, Buddhism, Confucianism, and Taoism. This material has been chosen from a literary as well as a philosophical point of view, includes the best translations wherever possible, and in the majority of Chinese selections consists of new translations by Lin Yutang. The result is magnificent.

*WEATHER: AN INTRODUCTORY METEOROLOGY. By W. G. Kendrew. 94 pages; index; illustrated. Oxford University Press, 1943. \$1.00.*

With wartime restrictions on weather forecasts it is important that those to whom weather is an important matter should know enough of its composition to be able to read its natural signs and signals. Mr. Kendrew lucidly explains the fundamentals of the hows and whys of weather, and amplifies his explanation with 22 explanatory drawings. This little book should be useful as an elementary text.

*MANUAL OF EXPLOSIVES, MILITARY PYROTECHNICS, AND CHEMICAL WARFARE AGENTS. By Jules Bebie, 171 pages. The Macmillan Co., 1943. \$2.50.*

To appreciate this book completely, one must have some knowledge of chemistry. However, for those not familiar with the subject, the book offers great assistance in identifying gases, smoke, and explosives.

Dr. Bebie has not attempted to include all of the chemical gases or explosives, but he does list those most commonly used and with which most of us should familiarize ourselves to some extent. This manual is an excellent reference guide in that it contains a directory of explosives and explosive mixtures. From this directory one can easily locate an explosive or gas by knowing one of its many chemical synonyms, trade names, or chemical warfare symbols.

Including composition, properties, and uses of industrial and military explosives and explosive mixtures, this book should be of especial interest to chemical warfare officers as well as unit gas officers. It offers much data and reference not found in Field Manuals.

B. H. W.

*APPEASEMENT'S CHILD: The Franco Regime in Spain. By Thomas J. Hamilton. Alfred A. Knopf, 1943. 323 pages; bibliography; index. \$3.00.*

Spain has been a proving ground in more ways than one. During her civil war the Axis tested its equipment and tactics. Since then, Spain has again proved that clothing petty bureaucrats with a bit of authority is fatal to the smooth running of any country. Not satisfied with "super-planning's" failure to handle peace-time Nazi economy efficiently, Spain set up her own hierarchy of totalitarianism. The result, of course, was paralysis of industry, commerce, even life itself. Again was proved the impotence of half-baked, impractical, inexperienced, self-centered, and self-seeking theorists, when pitted against the actualities of life and economics. Incidentally, the world will be better off if these facts have been pounded into the consciousness of all nations which have not yet been wrecked by ignoring them.

This unpleasant picture of the Franco regime is clearly given by a

man who lived those scenes, fought the bureaucrats, struggled as an ordinary resident with the red tape, indifference, ignorance—and worse. Mr. Hamilton also, as a *New York Times* correspondent, dug into Spain's and Franco's role in the present war; how it has hampered the Allies, aided the Axis, done its best to hamstring us in Europe and in Latin America as well. *Appeasement's Child* is a "background" book covering a little touched field, but one which must be better known for a rounded understanding of the world today.

*DON'T BLAME THE GENERALS.* By Alan Moorehead. Harper & Bros. 312 pages; endpaper map; photographs. \$3.50.

This story is primarily that of the British Eighth Army under Wavell and Auchinleck (to El Alamein), told by the Australian-born correspondent of the London *Daily Express*. It flows smoothly and gives a full picture of events around the author.

His general theme is that the African campaign was bound to go as it did, and that the men in command—Wavell at first, and later Auchinleck—were not by any means completely to blame for the defeats suffered by the British forces. The Germans simply had more and better of everything: physical equipment, physical and mental training of the troops, and methods of keeping the morale of their troops high. To make matters worse for the British, nearly 30 of their top-flight commanders were lost by death, capture, or wounds; and at times even the ranks of junior commanders of the tank corps were too depleted for efficient use.

Moorehead compares armies to pyramids—all the parts build up to the top stone, the general. The general can only be as strong as the foundation under him, but he is the point on which eyes fasten and therefore is apt to become the whipping-boy when things do not go well.

As we have seen from events since the close of the book, when it has equipment and training equal to that of the Germans the Eighth Army can push Rommel around. Newspaper reports, plus that superb movie *Desert Victory* (produced by the British Army on the North African front itself), prove conclusively that in the long run equipment is the factor that goes farthest in determining who shall be the winner and who shall be the loser. Generals alone don't win or lose; generals form only part of the picture; the soldiers, their weapons, and the generals all have to be woven into a strong fabric to be able to cover and smother the fire of the enemy. Moorehead's theory has now become a fact.

J. M. C.

*NOTES ON COMBAT TRAINING.* By Brig. Gen. Luis Raul Esteves. 199 pages. Military Service Publishing Co. 75c.

*Notes on Combat Training* is strictly what it implies: notes that every officer should have and keep at his fingertips during combat. It was written primarily for infantry officers, but it will serve a great purpose among officers of all branches.

General Esteves has divided the book into four parts: Preparation for Combat; Security; The Offensive; and The Defensive. Each is outlined clearly and exactly as to what should be known and done for every conceivable circumstance during combat training.

Instead of trying to make up and read your own notes, my suggestion is to secure this book because it contains a great deal of up-to-the-minute authoritative data which can easily be used as reference at the opportune time.

B. H. W.

*SECRET AND URGENT: The Story of Codes and Ciphers.* By Fletcher Pratt. Blue Ribbon Books. 278 pages; index. \$1.00.

This is an extremely interesting book just now, when codes and ciphers play so important a part. It tells how they are written and how they are decoded, as well as including an appendix of tables of the frequencies of letters, bigrams, and trigrams. In view of its many historical examples it is a book which anyone can thoroughly enjoy reading.

M. K. W.

When the Kiowas and Comanches hit the war-path, no white man on the plains was safe. They combed their hair one morning, an Indian combed it the next.

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*I SAW TWO ENGLANDS.* By H. V. Morton. Dodd, Mead & Co., 1943. 316 pages; index; photographs. \$3.00.

*I Saw Two Englands* is a book of sharp contrasts between the leisurely enjoyment of technical peace and the engagement in war.

The first and larger part of the book is a vivid account of a pre-war jaunt of the author to points of beauty and historical interest on the island. His awareness of impending war heightens his sensitiveness to the lure of the country. The precarious peace of appeasement sharpens his feeling for English history, legends, manners, and traditions: it is as if he must snatch another and yet another glimpse before the war breaks in upon his determined enjoyment. Even while the people are complacent with a general air of business as usual, there is an uncomfortable feeling that tomorrow these things may not be within easy reach.

The last part of the book describes travels in the other England, wartime England, an eerie land of sandbags, blackouts, and a curious air of pre-invasion restlessness. Travel, formerly such a pleasant diversion, has become an undertaking laid out in terms of petrol coupons, credentials, and letters of introduction. The charm of peacetime England has given way to a hesitant, laconic acceptance of war with its attendant shift in interests and activities. The author finds the spectacle of a potentially efficient people dulled by lack of leadership very depressing.

F. E. J.

*GENERALSHIP: Its Diseases and Their Cure.* By Maj-Gen. J. F. C. Fuller. Military Service Publishing Co. 106 pages. \$1.00.

Perhaps lost in the wealth of material recently printed on leadership, morale, and kindred subjects, this little book (which was published in 1936) has been too overlooked. As you already know, Gen. Fuller is both keen-minded and articulate—his early appreciation and advocacy of the tank bear witness to this.

In *Generalship* he has written as fascinating a study of the attributes of command as you will find. Although ostensibly addressed to the "high command," it pertains equally to the battery officer. Unstodgy, full of flowing tales of the past, negative as well as positive, it is good reading. And sound.

*MILITARY JUSTICE FOR THE FIELD SOLDIER.* By Lt. Col. Frederick Bernays Wiener, JAGD. 101 pages; appendices. *The Infantry Journal*. \$1.00.

Expanded from previously published articles, *Military Justice for the Field Soldier* should be a distinct help to the many young officers who are having their first experience in the administration of justice. True, the *Manual for Courts Martial* covers all the ground, and is the "bible." But it is written in legal language.

Legal language is clear, yet its mere mention seems to give many people "buck fever." It does contain technical terms, of course, as does also the "language" of the army as a whole as well as its several branches. Aware of and resigned to the fact that few people are willing to analyze the *Manual*, Lt. Col. Wiener has covered the field with this excellent book in strictly non-technical form. He thus has performed a definite service for all who prepare charges, investigate them, or are connected with courts martial in any capacity—and that includes just about all of us.

*BADEN-POWELL: A Biography of Lord Baden-Powell of Gilwell.* By E. E. Reynolds. Oxford University Press, 1943. 272 pages; appendices; illustrated. \$2.75.

Soldier, big-game hunter, author, artist, traveller—but most of all a keen lover of boys and the outdoors. Founder of the Boy Scout movement, and its mentor and sage until his death in his 84th year. Contemporary and friend of our own Dan Beard, and like him the zestful liver of a full life. All these and more was Sir Robert Baden-Powell.

This biography is "official" only in that it was undertaken at the request of the Council of the Boy Scouts Association. The biographer

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had full latitude in choosing and interpreting a wealth of material—and he has done a splendid job. The result is a book with wide appeal to the hundreds of thousands who have been connected with the Scouts.

*IN PEACE JAPAN BREEDS WAR.* By Gustav Eckstein. Harper & Bros., 1943. 321 pages; index. \$2.50.

This book relates Mr. Eckstein's personal impressions and experiences during his stay in Japan. He explains why war with Japan was inevitable from the time of the Exclusion Act, July 1, 1924. One of the more "thoroughbred" books on this subject, it is a fascinating study that is helpful for an understanding of our enemy and his future moves.  
M. K. W.

*YOUR ORGANIZATION.* By Philip Leonard Green. Hastings House, 1943. 171 pages; index. \$2.50.

Subtitled *A Manual for Making Plans and Procedures*, this is an unusual book. It might be called an "efficiency" manual, for it aims to instill logical methods of approach to problems and at the same time give concrete help. Not just theoretical, it is full of suggestive outlines, check-lists, and the like.

*FRANCE.* By Pierre Maillaud. Oxford University Press. 134 pages; index. \$1.25.

This little book is written with one thought in mind: to unite France and Britain, to make these nations understand one another. It explains how France was called upon to bear the main weight of the German offensive not only in 1914-1918 but also in 1940. It is an interesting outline of French history, politics, and warfare.

M. K. W.

*THE SOLDIER AND THE LAW (Second Edition).* By John A. McComsey and Morris O. Edwards. 339 pages; appendices; index. Military Service Publishing Co., 1943. \$2.00.

In 1941 two instructors in the Department of Law at the Military Academy realized there was a need for a book to ease the adjustments when an individual shifted from civil to military environment. Their mission was two-fold: to prevent military delinquency, and to provide practical assistance to those concerned with the administration of military justice.

*The Soldier and the Law* was the admirable fruit of their labors. Unofficial, and a supplement to the *Manual for Courts-Martial* rather than a substitute for it, it has helped both officers and enlisted men incalculably. Passage of time and the test of use indicated that a new edition was desirable. This work has been performed by Col. Charles E. Cheever, Judge Advocate of the X Corps. The result is an excellent book which should be available to every man for information, and to every officer for reference.

*BRITAIN AND THE BRITISH PEOPLE.* By Ernest Barker. Oxford University Press, 1943. 136 pages; index; photographs; endpaper maps. \$1.25.

One of the series *The World Today*, this pocket-sized book is jampacked with information—both interesting and useful—on the community, English parliamentarianism, government, legal system, religion and churches, matters of the mind, and community (or social) care. Historical development of these things is sketched; many of them are well pictured by excellent photos; and useful endpaper maps of Great Britain and Ireland and of the London area are included.

*SKI TRACK ON THE BATTLEFIELD.* By V. A. Firsoff. A. S. Barnes & Co., 1943. 153 pages; bibliography; illustrations. \$2.00.

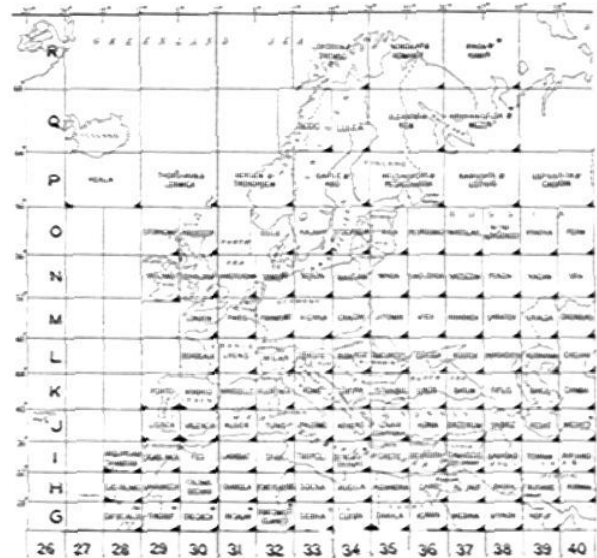
With appeal to both military and non-military readers, this account of campaigns in Finland, Russia, Norway, the Alps, and the Balkans gives a graphic picture of the armies of the snows. Skis themselves, and clothing, food, hygiene, equipment—all these are at least touched upon, the result being a satisfying and well-rounded book.

*BARRACK 3 ROOM 12.* By Marcel Haedrich. Reynal & Hitchcock, Inc., 1943. 229 pages. \$2.50.

This is a story of a Frenchman and ten other citizen-soldiers held

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in a German prison camp, who kept free, open minds while their bodies writhed behind prison bars. One lectured on Aegean Civilization, one studied Danish, another dissertated on Norwegian hors d'oeuvre, while the author read and reported all the German newspapers.

It is simply written and beautifully expressed.

M. K. W.

*THEY CALL IT PACIFIC.* By Clark Lee. The Viking Press, 1943. 365 pages; index; endpaper map. \$3.00.

Pacific is hardly a fitting name for the scene of action in the war against Japan. The rounded fullness of its irony intrudes persistently in the stories of desperate fighting from Bataan to the Solomon Islands. Clark Lee, war correspondent with the Associated Press, emphasizes the incongruity in his eye witness accounts of combat on the islands.

These accounts of developments in the war with Japan have a clarity and continuity far more satisfying than the fragmentary newspaper stories of the same events scattered over months or even years. In the light of the author's interpretations one sees the war in progress from its inception to the Solomons, and an uneasy feeling persists that a lack of planes are a rueful commentary on what might have been.

A note of warning against apathy and a plea for tough-minded realism ring through the incisive accounts of the "Pacific war." "The men that we lost at Pearl Harbor were martyrs to unpreparedness."

The stories of daring and grim determination tragically dissipated by a lack of planes are a rueful commentary on what might have been.

The author's way of describing events and natural human reactions gives the reader a feeling of identification with the experiences in the Pacific.

F. E. J.

*FII: LITTLE INDIA OF THE PACIFIC.* By John Wesley Coulter. University of Chicago Press. 150 pages. \$2.00.

Mr. Coulter has assembled a considerable amount of data in this interesting book. It is strictly a geography of the Islands of Fiji, Great Britain's most important island group in the South Pacific Ocean and the headquarters of the British High Commissioner. It gives a clear picture of economic and political conditions of the islands and their mixed people.

The clever way in which the author, who is head of the Department of Geography, University of Hawaii (now Lt. Col. in U. S. Army), tells the story makes it interesting reading for those not particularly fond of geography. In a sense it is a complete story of the different races of people that live on Fiji and the future that confronts them.

B. H. W.

*WHITE MAN'S FOLLY.* By Vanya Oakes. Houghton Mifflin Co. 415 pages. \$3.00.

This depicts the adventures of Miss Oakes in the Orient and her futile efforts in trying to warn America of the Japanese situation and make us aware of the miasma, symptomatic of complete unawareness of the fact that Ancient China was crumbling history and that a New China was struggling into life.

Miss Oakes gives us a vivid description of the intrigue of Japan and its hatred for us. Her first-hand knowledge of the bombing of Shanghai, the building of the Burma Road, and the hardships of the Flying Tigers makes her realize more than ever that East is East, West is West, and never the twain shall meet.

It is a book everyone should read to learn how that incident. PEARL HARBOR, occurred right under our very nose, by our self-righteous complacency in being so very unwilling to recognize our peril and act on same.

M. K. W.

*CLAUSEWITZ ON THE ART OF WARFARE.* 185 pages; Longmans, Green & Co. \$1.50.

Clausewitz's name has long been more familiar than his writings. It has been tossed here and bandied there by "experts," but only recently have we been warming up to his works themselves. We have a splendid distillate in the recently published *Principles of War* (reviewed in the JOURNAL for December, 1942). Next fall should see publication of the complete text of *On War*. And here we most appropriately have an excellent group of selections from that monumental book. Clausewitz's soundness is illustrated by his describing events of the present war, in chapters which deal with war's nature and theory, strategy, offense and defense, the plan of war and war and politics.

*Clausewitz On the Art of Warfare* is a fine intermediate volume with which to progress toward his unabridged analysis.

*FUNDAMENTALS OF RADIO.* By Jordan, Nelson, Osterbrock, Pumphrey, and Smeby; edited by Everitt. Prentice-Hall, Inc. 392 pages; illustrated; index. \$5.00.

*ELEMENTS OF RADIO.* By Abraham and William Marcus. Prentice-Hall, Inc., 1943. 672 pages; illustrated; appendix; index. \$4.00.

Written and edited by five professors, assistant professors, and instructors of electrical engineering, and the director of engineering of the National Association of Broadcasters, *Fundamentals of Radio* is complete and authoritative, and is aimed at the technician rather than the engineer. Algebra is the highest form of mathematics used—and it is conveniently reviewed in the opening chapter. But the entire field is covered, from the simplest AC and DC circuits through FM transmission. It is being widely used as a text, by the Coast Guard, Marine Corps, and Junior Repairman Trainee Course of the Signal Corps.

For self-study, *Elements of Radio* would be the better of these two. Its first half is devoid of formulae; instead, it is devoted to receivers and how and why they work. It is eminently logical to approach the subject via the instrument with which the student is most familiar as a result of his environment.

Another advantage is use of the "spiral" approach. In the first cycle is presented an extremely elementary explanation. The next turn around covers the same ground, but at a somewhat higher level. And so on through the various cycles, but at each level the complete radio receiver is presented. Thus is interest maintained. Furthermore, set construction is covered at each level, so one can see how developing theory is put into practice.

The second half of the book is devoted to electrical theory, transmitters, and the more advanced aspects of radio.

Study is facilitated by each chapter's having problems, questions, and a glossary. Useful tables are grouped in the Appendix. And classroom demonstrations will greatly aid the instructor who may use this book as a text.

*CAPTAIN OF THE ANDES: The Life of José de San Martín.* By Margaret Hayne Harrison. 205 pages; bibliography; index; endpaper maps. Richard R. Smith. \$3.00.

Spain had colonized and organized a larger part of South America than had England in North America, when separatist revolutions came to these continents. And the sections of South America were separated by mountains and jungles. Its revolt thus was in two parts: a northern one under Bolívar and an independent one headed by San Martín.

Over a hundred years have passed since the collapse of this Spanish empire, but the partisanship for or against the two leaders is apparently as strong as ever. Both sought freedom from the Spanish yoke, and neither man was personally ambitious, yet the proponents of one speak of the other either disparagingly or not at all. This seems most strange, especially in view of the size of the continent, the great

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achievements of each liberator, and the fact that their work was complementary rather than conflicting.

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*THIS TIME FOR KEEPS.* By John MacCormac. The Viking Press, 1943. 196 pages. \$2.00.

This book of essays was written in an effort to define and state the things for which America fights. Mr. MacCormac rightly feels that soldier and civilian alike cannot wholeheartedly enter into the struggle without knowing the goals for which they struggle and without a conviction that they are right. While the author finds a general indication of America's war aims in the terms of the Atlantic Charter, he is compelled by their lack of precision to offer a more definite program of his own. Not only is America fighting for survival, but she is also fighting to establish a world order which will make it impossible for another world war to occur. America must realize that she is no longer capable of remaining aloof, but must actively share in the responsibility for creating a democratic Europe. Germany's fascist leaders must be executed and the German people placed in tutelage under a democratic regime. The democracy of the post-war world must assure its members both personal freedom and economic security.

While the substance of this book may be considered rather slight, an interesting and liberal discussion of the leading questions of the future is presented.

H. A.

*HOW TO SHOOT THE U. S. ARMY RIFLE.* The Infantry Journal, Inc. 122 pages. 25c.

This book should be standard equipment for every soldier during his training period or until he has completely mastered the art of shooting the Army rifle. It is self-teaching in every respect. Its countless illustrations show every phase of shooting and handling the rifle.

B. H. W.

*TUNIS EXPEDITION.* By Col. Darryl F. Zanuck. Random House, 1943. 160 pages; photos. \$2.00.

Here is a day-by-day account of the war in North Africa told by Col. Zanuck, who landed with Lt. Gen. Mark Clark; attended the historic conferences between General Eisenhower, Robert Murphy, General Giraud, and Admiral Darlan; and then went to the Tunisian front with the first American units.

M. K. W.

*SERGEANT TERRY BULL: His Ideas on War and Fighting in General.* By Terry Bull. 174 pages. The Infantry Journal. 25c.

Col. William H. Triplet's fertile mind and flowing pen are well known through his "war-in-the-future" articles in the *Infantry Journal* in years past. Some of these breezy tales of the Mungo War are now reprinted — although unfortunately without their original illustrations. Good reading.

*WITH PERRY IN JAPAN: The Diary of Edward Yorke McCauley.* Edited by Allan B. Cole. Princeton University Press. 126 pages; illustrated. \$2.50.

Among the young midshipmen with Perry's second (and more important) visit to Japan was the spirited and talented McCauley, who was later to become a Rear Admiral. His illustrated journal of that cruise gives a lively, first-hand account. It is interesting to note how little the Japanese character has changed in the intervening 90 years. One instance: although Japan had presumably been in strictest seclusion, moments of strained relations revealed that some Nips most unexpectedly could speak English! In some ways, however, our "superior" attitudes got us off on a bad start and perhaps colored the relationship from the very beginning; in view of Jap traits of character, though, it is extremely questionable that this had any serious effect on developments through the years.

*ITALY FROM WITHIN.* By Richard G. Massock. 392 pages; index. The Macmillan Co. \$3.00.

The chief of the AP's Rome Bureau from 1938 till he was repatriated in 1942 has written a straight, factual book that tells the story of Italy under the Fascist banner. Mr. Massock knows the country and the people well. He was among them long enough to acquire *spracht gefiel* concerning their reasoning and reactions. Therefore his book flows easily and there are no interruptions while he analyzes the situation for his readers—or for himself, perhaps.

An excellent book to give you the framework of the Italian state or to refresh your knowledge of it. The book moves rapidly and you are never weighed down by an overpowering sense of figures and statistics.

J. M. C.

*ROY BEAN.* By C. L. Sonnichsen. The Macmillan Company, 1943. 207 pages. \$2.50.

Yes, Langtry, Texas, is on the map—just. Seventy-odd miles west of Del Rio, not far west of where the Southern Pacific crosses the Pecos, is a dot with its name, a little dot which the legend says means 0-250 inhabitants.

The little town is far-famed, however, as the home of Roy Bean during his last twenty years—Roy Bean, the self-styled "Law West of the Pecos." Roy Bean who, prosaically born near Maysville, Kentucky, had an adventurous youth in Mexico and in California of '49. Roy Bean, who was part of the West from his dandified youth to a paunchy old age. Roy Bean, who had the spirit of adventure, guile, and acquisitiveness even when living in the squalid section of San Antonio which bore his name. The man who in his fifties began carving his place in our folk-lore, as the man who brought "justice" into construction camps of the a-borning transcontinental line—with his headquarters at a vanished spot known as Vinegaroon.

Legends of this character are legion. The man himself had attributes of Solomon, Robin Hood, and Jesse James. You'll enjoy this first full-length biography hugely.

*EXCESS BAGGAGE.* By Betty Utley St. John. Hastings House. 155 pages. \$2.00.

The letters of the new bride of a new Second Lieutenant to her family, from the day of her wedding till five months later when leave takes her homeward.

The epistles present the everyday goings on of her life from New York to Galveston to California, with emphasis on trying to find a place in which to live. They are light and airy to read and are well illustrated by the author's sketches.

If you have a chance to pick the book up to look it over, it is well worth the while, but it is not one to buy and then worry about what book to throw out in order to make room for it.

J. M. C.

*HOW THE JAP ARMY FIGHTS.* By Lt. Col. Paul W. Thompson, Lt. Col. Harold Doud, Lt. John Scofield, and Col. Milton A. Hill. Penguin Books—*Infantry Journal*. 160 pages; photographs. 25c.

This little book gives a quite-well written short review of Japanese character and operations. History, organization, and preparations of its army are told clearly, and campaigns in the China "incident" and the fight for Malaya are well reviewed. More recent operations than those in the Philippines have lately occupied our minds, but we would do well to re-read periodically the lessons of Bataan which Colonel Hill so ably describes.

It closes with appendices of Japanese terms and characters, together with an assortment of photographs.

*A LATIN AMERICAN SPEAKS.* By Luis Quintanilla. The Macmillan Co., 1943. 249 pages; appendices; index. \$2.50.

From a brilliant American comes this treatise on America, its past, its present, and (with great emphasis on faith in our democratic way of life) its future. Dr. Quintanilla, former counsellor of the Mexican

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Dr. Quintanilla similarly pictures economic facts and faults both north and south of the Rio Grande, in this straightforward book by one who both knows and loves both Anglo- and Latin-America.

C. R. D.

*COMPANY ADMINISTRATION AND PERSONNEL RECORDS.* By Lt. Col. C. M. Virtue, Inf. Military Publishing Co., 1943. 387 pages; appendix; index; illustrated. Cloth edition:

\$2.00; in paper: \$1.50.

Again Colonel Virtue and his publishers are keeping this most useful book thoroughly up-to-date. There is scarcely a question on any phase of army administration which cannot be answered by referring to this text. Sample forms are filled out as well as being thoroughly discussed, and reference is made throughout to the pertinent Army Regulations, War Department Circulars, etc. Deservedly a best seller, this book is always well thumbed by its owners.

*BLITZ FRENCH.* By Georges Nicot. Military Service Publishing Co. 136 pages. \$.75.

This is a handbook of action French for the fighting forces. It contains no grammar, no verb conjugations, and no complicated sentences. It should be of great help to those who do not know any French whatsoever.

M. K. W.

*MILITARY MEDICAL MANUAL.* 5th edition. Military Service Publishing Co. 985 pages; charts; drawings; photos; index. \$4.50.

A thoroughgoing text, this Manual contains much material of value to all arms and services. Its first third is devoted to military subjects, such basic topics as organization and tactical functions of different units, command and staff functions, map reading, motor vehicles, etc. The next fifth dwells on medical subjects, mostly in a way that would benefit any officer in the field, be he a medico or not. Medical tactics and administration complete the book, and here gain the treatment of administration, mess management, and supply are of value to all, while staff officers should be familiar with the operation of the medical service in units of different sizes. Although not an "official" manual in any sense, *Military Medical Manual* bears a preface by The Surgeon General. His foreword states that this manual ". . . may be accepted as a practical and reliable text concerning military medical matters." This reviewer noted nothing that would be an exception to that recommendation.

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