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**FIELD ARTILLERY**  
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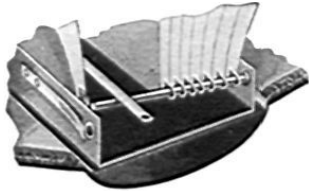


IN THIS ISSUE:

*Air OPs*

MAY, 1944

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**LT. COL. JOHN E. COLEMAN, Editor**  
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OUR COVER PHOTO shows a Piper Cub flying over Allied territory in Italy. In addition to their fine work described in this issue of your JOURNAL, *Life* says these planes have been used to scatter propaganda leaflets on the enemy.

ASSOCIATION MEMBERSHIP is still on the upgrade. Prominent among organizations with a large number of new members are the Marine Corps Schools, the 414th FA Group, and the 302nd, 356th, and 371st FA Battalions. To them and our many other firm friends, our sincere thanks.

One problem faced by all magazines is the relatively large turnover of members. Combat, troop movements, or other causes intervene to delay remittance of renewal dues. No matter how great the delay, send your renewal on in as a renewal—if at all possible we will send every issue you may have missed, and pick you up as if there had been no interruption.

OUR OVERSEAS AUTHORS have the thanks of all for sharing their experiences with those who will follow them. Their efforts are keeping THE FIELD ARTILLERY JOURNAL in the very forefront of the publications covering the technical and tactical aspects of this war. We welcome all of such material that we can get on any subject of value to artillerymen. Yes, that covers a tremendous amount of ground, we know—but so do the interests of the artillery.

Especially do we seek articles on such hitherto-overlooked subjects as medium artillery in the South and Southwest Pacific; liaison officers everywhere, whether with light, medium, or corps units; tank destroyer units (towed or SP, either in an AT role or as reinforcements for divisional artillery); and the infantry cannon company. Mark your material as being for us and send it along either directly or through your overseas PRO channels. And if you can include some photos or drawings so much the better, although they are not always essential.

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# The Field Artillery Journal

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

**MAY, 1994—Vol. 34, No. 5**

## SECTION I

	PAGE
AIR OPS. ....	274
<i>By Maj. Edward A. Raymond, FA</i>	
... IN NEW GUINEA .....	278
<i>By Capt. Robert M. White, II, FA</i>	
... IN ITALY .....	280
<i>By Lt. N. S. P. Stitt, FA</i>	
ABC METHOD OF MASS TANK FIRE .....	281
<i>By Capt. Sydney S. Combs, FA</i>	
PERIMETERS IN PARAGRAPHS .....	282
<i>By Col. Conrad H. Lanza</i>	
BORESIGHTING .....	295
<i>By Maj. Marion H. Schultz, FA, and Capt. Lauren K. Soth, FA</i>	
12-INCH GRAPHICAL FIRING TABLE.....	298
<i>By Lt. Col. Abbott H. Burns, FA</i>	
PLANS FOR SHELL SEPARATOR .....	299
<i>By Lt. John E. Barth, FA</i>	
CROSS-RULE COORDINATES .....	300
<i>By T/3 James W. Pool, FA</i>	
MOBILIZING YOUR THOUGHTS, PART I.....	301
<i>By Maj. W. P. Woodruff, FA</i>	
"HIGH ANGLE FIRE PLUS 6400-MIL FIELD OF FIRE" .....	304
<i>By Lt. Scott A. McKinnon, FA</i>	
JAPANESE MANDATED ISLANDS.....	306
<i>By Col. Conrad H. Lanza</i>	
MORE ON BEING A SAFETY OFFICER.....	310
<i>By Lt. Jerome S. McIntee, FA</i>	
BASIC POINTERS ON TIMEPIECES .....	311
GERMAN 15-CM (5.9") HOWITZERS .....	312
<i>By Lt. Col. G. B. Jarrett, Ord.</i>	
LIGHT ARTILLERY IN THE PURSUIT .....	317
<i>By Lt. Col. I. Malikin</i>	
LET'S PASS THOSE TESTS! .....	318
<i>By Maj. William L. Harr, FA</i>	
THE ADVANCE.....	321
<i>By Capt. W. R. Young, M.C., R.A.</i>	
BEWARE OF THESE! .....	324
RECOGNITION .....	325
<i>By Maj. Harold J. Blubm, FA</i>	
DOUBLE TROUBLE.....	326
<i>By Hiram J. Herbert</i>	
NOT IN THE BOOK.....	327
DIARY OF WAR EVENTS .....	328
FOR HEROISM AND SERVICE .....	329
BOOK REVIEWS .....	330

## SECTION II

FIRING TABLE SCALES .....	Insert
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*Authors alone are responsible for statements made.*

*No articles are official unless specifically so described.*



*Fields for "grasshopper" planes require little preparation. From the air this one near Venafro looks just like any pasture. In the background are typically rugged, ragged, barren mountains, their summits often enveloped by clouds.*

## AIR OPS . . .

By Maj. Edward A. Raymond, FA

Organic air observation for artillery has come into its own after trial in Africa, Sicily, and Italy. The development of its use throughout the three campaigns is an interesting tale from the professional point of view, and it is a tale of courage, skill, and determination on the part of observers and pilots well worth the telling.

### FIRST MISSIONS

On 9 Nov 42 three "flying jeeps" took off from an aircraft carrier 40 miles at sea for the racetrack at Fedala. This was not a combat mission, as the pilots (Capt. Alcorn, Capt. B. A. Devol, Jr., Lt. Butler, and Lt. John R. Shell) had not had contact with their battalions. They had been sent from Fort Sill to Camp Pickett, Virginia, to join the 3d Div, and upon reporting were sent, with field bags as their only personal luggage, to Norfolk, Va. They left on the destroyer USS *Dallas* for Bermuda and there went aboard the USS *Ranger*. They found three old L-4Bs in poor condition, tied up on the rafters of the hangar deck. Upon installing SCR-610 radios which they had with them, it was discovered that only one would work.

They took off on D day with some qualms. When they got close to shore they were fired upon by ships of our navy (including a cruiser, several destroyers, and several troopships) but were not hit. When they got over the shore our ground forces opened up on them.

By that time the three planes had separated. Capt. Alcorn was shot down, but escaped with his life—but had to return to America on account of his injuries. Lt. Butler, with Capt. Devol as passenger, made it to the racetrack safely. Lt. Shell was forced down by heavy machine gun fire in the middle of an infantry regimental area, but landed without injury to himself or his plane. He sent word to units near the racetrack that he was coming and took off again. This time he was fired on once more, but made it. A major from the Div Arty was at the racetrack to meet him; upon sighting the plane he mistook it for an enemy aircraft and fired his Tommy gun, fortunately without effect. The Air OPs stood by at the racetrack until the surrender of the French.

### IN TUNISIA

In Tunisia Lt. DeWitt of the 1st Armd Div flew the pioneer combat mission. During the winter and early spring only a few "grasshoppers" were used for fire missions. In that mountainous country terrestrial observation was very good and other types of missions were urgently needed. One of these was reconnaissance to check whether tanks or other vehicles were friendly or hostile. Due to dust this was often hard to determine from the ground, yet delay was dangerous.

Division and corps commanders used their artillery planes extensively for front line reconnaissance, even to the extent of going up as observers themselves. One divisional artillery commander relied on his planes for preliminary position and route reconnaissance. This offset to some extent a lack of aerial photographs which was felt throughout the North African campaign. Convoy checks and camouflage checks were also useful, and at critical junctures courier service proved invaluable.

It was in the battles of El Guettar, Mateur, and Bizerte that the Air OP completely silenced its scoffers. The enemy was past-master of camouflage, but observers were able to pick up gun flashes from the most perfectly concealed positions. It became increasingly true that hostile firing ceased when our planes were in the air.

### ISLAND INVASION

A major general who acted as a War Department observer for the initial landing in Sicily noted the following in his report:

"There was one young field artilleryman in the —th Div who flew his Cub plane off the deck of an LST (landing ship, tank) at daylight on D-day and reconnoitered the beach and the country beyond it. A runway of some kind had been laid on the deck and he managed to get his plane off. He landed on the beach and delivered valuable information to the proper people." (A later report is to the effect that naval gunfire was also effectively directed by this same officer.)

Capt. B. A. Devol, Jr., tells us more: "A flight deck, approximately 70 yards long and 12 feet wide, was designed and



built by Capt. Carlson, —th Engineers. The framework was built mainly from 4"×6" timbers; this framework was anchored to the deck by a series of wire braces fastened to the tie-down anchors on the deck of the ship. The floor of the flight deck was made of steel matting such as is used by the Engineers for airplane runways and roads. The runway extended down the center of the ship from the bridge, and at the same height as the floor of the bridge, to the bow and over the top of the bow's 3" gun. A slight rise in the runway started about ¾ of the way down, running up to the bow of the ship (approx. 3' vertical). By trimming the LST, adding ballast to the forward tanks, the first ¾ of the runway was slightly down hill and the last ¼ level. The initial flight was made without trimming the ship.

"Our initial flight was made on July 4, 1943. The tail of the plane was placed in flying position to enable the pilot to see the runway at all times. A white strip painted down the center of the runway aided the pilot in keeping his plane centered on the runway. A braked wheel take-off was made; the plane held on the deck until the end of the runway was reached. There was about a 10 m.p.h. wind blowing, plus about 9 knots speed of the ship (which was headed directly into the wind). This gave approximately a 20 m.p.h. wind blowing down the flight deck. Flying speed was attained about ¾ of the way down the runway. No trouble was experienced in holding the plane straight on the deck.

"After the initial flight an 8" side wall was placed the length of both sides of the runway. This made the total width of the runway, between walks, about 10'.

"Four planes were being carried on the carrier for this operation. In addition, 4 more were disassembled and loaded on 2½-ton cargo trucks, long wheel base. Of the four planes on the LST carrier, 2 were placed in the flight deck and 2 on the top deck of the ship. A ramp was built from the top deck of the ship to the flight deck. The two planes on the top deck of the ship were easily pulled up the ramp to the flight deck. The planes were loaded on the ship by means of a crane.

"One of the airplanes had been equipped with a public address system and radio, the other 3 with radios. Two of the planes (the one equipped with the PA system and another) were to be used by the Force Commander to keep contact with the landing boats and beaches, and keep him posted on the movements of our troops. The other two planes were flown immediately ashore to be used as the division artillery commander saw fit.

"One landing field will normally be picked, prepared, and marked on each beach to receive the planes from the carrier."

#### SICILIAN CONDITIONS

Several factors made Air OP flying over the island of Sicily both difficult and hazardous. The terrain itself was rugged and the air over it was unstable. Landing strips were few, and far behind the lines. It was often necessary for the planes of more than one division to operate from the same landing strip. The headlong rush of our troops caused rapid changes in the front and also in the direction of effort. These difficulties did not prevent the artillery pilots and observers from doing good work and lots of it, but they did give rise to some experimental tactics along the northern coast which proved to be highly successful.

The procedure was to fly out to sea several thousand yards, far enough to avoid ack-ack and small arms fire, then to fly parallel to the beach until nearly opposite—or opposite, or even beyond—the enemy installations. Observation was possible up

the numerous valleys which came down to the sea, and it was possible to observe the road and railway which ran behind the enemy front lines. When observing, planes had a natural tendency to edge in close to the beach, and in the aggregate they drew a great deal of rifle, machine gun, and light AA fire, and some 88-mm high burst adjustments. Numerous attacks were made by Me-109s and FW-190s in numbers up to 6, and some attacks were made by Ju-87s and He-111s. Only once during the Sicilian campaign was an Air OP attacked by a single plane. It is a tribute to the evasive tactics taught at Sill that the artillery planes escaped in every case. Caught over the water they were in an extremely embarrassing position indeed, but with their slow speed and maneuverability they were relatively safe when they reached the mountainous terrain along the shore. They could execute much closer contour flying than their fast, heavy opponents. In Sicily enemy aircraft were not persistent in their attacks on artillery planes, and in all but one case dropped the fight after making a single pass.

The lack of regularly organized Forward Observer Sections in FA battalions to handle FO missions, which amount to some 75-80% of all observed fires, has led to a consistent shortage of observers for the Air OPs. In mountainous country landing strips are rarely found in the battalion area, and are commonly 10 miles to the rear. Even when forward observers are available from battery personnel, they are not usually available on short notice. In Tunisia and Sicily it was frequently necessary to send up two pilots together, one to fly and the other to observe. This put too many eggs in one basket, but was a necessary makeshift measure.

An example of a Sicilian mission is given by Lt. E. R. Smartt, a pilot who acted as observer on the mission:

"In extremely broken country along the northern shore of Sicily a 155-mm howitzer battalion position was taken under fire by German artillery. In the rough terrain there were no alternate positions except far to the rear. The forward observers were unable to spot the enemy. Casualties were rising. The situation was serious. S-3 radioed to the small landing strip along the beach, several miles behind our own guns. 'Battalion position being shelled badly. Take off immediately to locate enemy battery and adjust fire.' S/Sgt. Moody and I had been standing by and started immediately. We went up the coast, keeping several hundred yards out to sea. As we approached a point abreast of the battalion position we checked communications. Then, almost before I could realize what I was seeing, several bright flashes appeared from some woods across a dry river bed. They showed white in the strong sun, which stood behind the advancing plane. They were several yards ahead. I made a quick estimation on my map. 'Coordinates 41.5—60.5.' At that location I reported 'Enemy battery. Request battalion.' From FDC came 'Roger, adjust Baker.' The cannoneers had scrambled out of their fox holes and loaded the pieces. 'Battery has fired.' And I replied 'Roger . . . 400 right, repeat range,' and on the next volley, '100 left, 100 short, fire for effect.' The guns gave me what I asked for. Meanwhile I spotted another flash some distance away so sensed the effect '50 left, 50 over,' and gave 'Repeat fire for effect.' Another concentration came down. The enemy did not fire from that position again."

At one stage in the campaign a combat team was landed near Cape Orlando, in rear of the enemy. The planes of the

artillery battalion of the combat team were in the air virtually all day long, the day of the assault. The staff sergeant pilots and the observers would take off from behind our main positions, fly out to sea, and up the coast to where the landing was in progress. Then they would come in close, establish communication, adjust fire, and keep the situation under observation. From dawn to dusk these pilots returned to their landing strip only to refuel. During the day Cape Orlando was dive bombed first by our planes, then later by those of the Nazis. Dogfights were going on and the Air OPs were confronted by enemy fighters more than once.

A naval reconnaissance mission was flown by a pilot from a division which was sweeping along the coast of Sicily in a hot pursuit action. An unidentified naval force was reported off shore, making for a point behind the American advance. The Division Commander started to make appropriate dispositions and sent out an Air OP. The pilot was not a specialist on naval silhouettes and had to fly his defenseless light plane very low and close to see whether the convoy was friendly. It was.

The situation in Sicily called for some other special missions. There were communication hops, on which "grasshoppers" contacted by radio artillery observers who had accompanied infantry elements forward beyond the range of their 610s. Sometimes the airplane radio relay was of great value. "Grasshoppers" linked the photo lab of an air reconnaissance squadron to the corps counterbattery office, obtaining prints for the artillery hours before they would have been delivered by road.

Air OPs located forward elements, watched for counterattacks, reported on the condition of roads and bridges, took oblique air photographs to speed reconnaissance, or just kept an eye on the enemy in general. Probably  $\frac{3}{4}$  of the artillery combat missions in Italy were of reconnaissance type, and it is estimated that well over half the missions flown, of all types, brought back information of operational value to artillery units.

#### INTO ITALY

The Italian campaign started off similarly to the Sicilian operation, except that lack of wind made take-offs from LCTs dangerous and caused the loss of a plane.

1st Lt. A. W. Shultz, Air Officer, 3d Div Arty, states that it is necessary here to fly most of the time at about 1,000', sometimes at 1,500', and sometimes even at 2,000'. "We pick up flashes and adjust by using adjacent terrain features. Sometimes we pick up smoke and fire area concentrations, occasionally at traffic on roads. Our usual targets are enemy gun batteries. Sometimes we have been able to pick up SP guns, and I think we destroyed one. We have had good luck in picking up German AA guns.

"Our records show that 1 observer flew on 20 different days between 11 Oct and 17 Nov. The longest time in the air for an observer was 5 hours, during which time he fired 4 missions; the shortest was 40 minutes. The average mission takes approximately  $1\frac{1}{4}$  hours; it takes about that long to locate a battery and fire a mission.

"The following figures may be of interest: 1 observer during October flew on 22 days, 9 days from 1-17 Nov. Another observer 17 days in October, 6 between 1-17 Nov. Another observer, 21 days in October, 11 between 1-17 Nov. Five missions in 1 day was the greatest number flown by any



*Here is a 155-mm gun emplaced on a steep hillside, as seen from a Cub. Although its muzzle is depressed, the embrasure is open; apparently a mission has just been completed or one is about to commence.*

observer; the average is about two. We find that we run in streaks as to the number of targets located. Sometimes we will be attacked while on a flight and have to come down in a hurry. On a good day in 4 or 5 hours you may be lucky and pick up a bunch of targets. Observation is better on a hazy day than on a bright day, as you can see artillery flashes better. Dawn and dusk are the best times to observe."

In order to obtain the best observation the Air OPs sometimes fly deep into enemy territory. They are always fired upon by enemy ground troops and often by antiaircraft guns as well. Initially pilots flew ahead until they drew hostile fire, and then operated just outside the danger zone. Jerry soon learned to hold his fire and let the planes come well into his positions before opening up. Now the pilots simply accept the operational risk. They report two ways of escaping ground fire: one is to dive toward the ground and fly away at low altitude, the other is to fly a zigzag course away from the fire. The enemy has learned to adjust with artillery on a point over which a plane is accustomed to fly. When it comes near, 10 or 15 air bursts are then fired in the vicinity. The countermeasure is to use different courses on each mission.

So successful have the Air OPs become that the Germans have been much impressed by them. One PW stated that every time he saw an Air OP plane his blood would boil because it was an insult to have that little defenseless box "bobbing around in the air and be unable to take any measures against it. Whenever the Cub plane puts in an appearance, guns are silenced and all personnel (infantry and artillery alike) remain quiet in the hope of escaping detection and the rain of steel that always follows discovery. The only effective measure against the Cub is the pursuit plane. We have a plane (Storch) similar to the Cub, but it has never been seen in Italy."

These comments are not entirely accurate: 2 Storch planes have been shot down on the Italian front, and the reader will have realized that AA fire is a constant danger to pilots when they are forced to fly over the enemy's lines. These inaccuracies, however, do not detract from the fact that the PW took our "grasshoppers" seriously, and genuinely feared them. Similar testimony is accumulating all the time, and the remarks cited here can be considered typical.

One countermeasure adopted by the Nazis has been the frequent bombing and shelling of landing strips. Careful camouflage and dispersion of planes is essential and personnel should have slit trenches and fox holes prepared at all times. Contour approaches and take-offs at landing strips are becoming increasingly important to keep their location secret as long as possible.

Another measure has been the launching of an air offensive against the light planes, using fighters in pairs. This is being countered by sending up Air OPs in pairs also—one to execute the mission, the other to act as lookout and give warning by radio. It has proved successful for the warning plane to fly at a lower altitude than the observing plane, to detect enemy planes that might be attempting to come up underneath the Air OPs.

One means of eluding enemy interception is night flying. This has become common on moonlight nights. Relatively large objectives (such as towns or road bends) are chosen, or hostile battery positions near some distinct feature. One counterbattery shoot caused an explosion that pushed the plane 100 feet higher in the air. Homing planes are lighted in by 8 or 9 men holding flashlights. It is extremely difficult to detect Cub planes from above at night, and to date enemy fighters have not interfered with these missions.

#### RELIEVING THE MAROONED

Lt. M. J. Strok, Fifth Army Air OP engineering officer, designed a parachute-dropping apparatus to supply troops marooned on a mountain in rear of Venafro. It was perfected and tested by the 3d Div. There are two types of loads: one is 2 water cans tied together, the other 72 cans of C rations. OD blankets are used as parachutes, so that the 'chute itself is a useful article when it reaches the ground. Drops are made from a height of 3-400'. If the drop is to be made in close proximity to extreme front line elements, a plane will go up first and adjust and fire concentrations including some smoke for screening purposes. Then the drop is made. It takes about 10 seconds for packages to reach the ground.

At a height of 400' the dropping point is 40' short of the desired point of landing. The parachute opens after the package has fallen about 100'. The package with water cans weighs 90 lbs., that with rations 65 lbs. One blanket 'chute is used for the water package, two for the rations; two ration bundles are dropped together, each with its own 'chute, and fall separately. The rations are placed in 105-mm fiber ammunition cases. Regular bomb releasing devices (for light fragmentary bomb) have been secured from the Air Forces and welded beneath the L-4 plane. The dropping kit alters flight characteristics to the point of becoming dangerous unless the plane is piloted with great care. It is hoped that this device will not be used to excess or in bad flying weather.

#### COMBAT CONDITIONS

The first loss of life of an artillery pilot in the air occurred when the Germans broke through at Kasserine Pass. Rather than burn his plane and retire on foot, Lt. Stewart took off directly toward advancing tanks and infantry. Lt. Barney had just flown out successfully, although losing his windshield by artillery fire in the process. Stewart was shot down by machine guns at virtually point-blank range. A party led by the Air section mechanics tried to beat back the Germans and reach the burning plane, but failed. Through Geneva it was learned that

Lt. Stewart was a prisoner in Italy, and a later message reported that he had died of wounds in the prison camp.

It was hard to find suitable landing fields in Sicily. One field obliged the pilot to take off with the prevailing wind toward the sun. S/Sgt. Wellborn was operating under these conditions one day and his plane failed to clear a century plant. His right landing gear struck the plant and was driven back into the fuselage, severing all stick controls. The pilot climbed to about 200' and attempted a rudder turn into the field. The rudder would not work. Far out at sea the plane "spun over the top" into approximately 25' of water. The pilot received a gash over his right eye and the observer received lacerations of the left ear; both were stunned. Two other members of the section swam out and rescued them, pushing empty water cans for floats.

A staff sergeant, flying with an observer over enemy territory, was hit in the leg by small arms fire. The pilot succeeded in landing his plane in our lines just before he fainted.

S/Sgt. Joseph J. Grady was flying 1st Lt. Melvin M. Smith as observer. Both were seriously wounded by enemy AA fire. Though unable to use his right arm, Sgt. Grady brought his plane in to a good landing.

While a technician was working on his plane's radio S/Sgt. James T. Smith, Jr., was suddenly confronted by an Me-109 which came around a mountain at very low altitude and opened fire. Sgt. Smith flipped his plane over to dive and one wing of the enemy fighter smashed through a wing of the Cub. Neither American survived the crash.

Capt. Baetjer, with his brigade executive as passenger, was flying generally northwest from Battepaglia. While gaining altitude to clear the mountains he was attacked by 3 Me-109s. His engine was shot out. It was necessary to pancake into a tree on landing, but both officers escaped with injuries. S/Sgt. C. M. Atkinson, flying a plane directly behind Capt. Baetjer at the time of the attack, got off scot free.

During an enemy air raid on 12 Nov a corps artillery observation plane was hit by American AA fire. About 100 holes were later counted in wings, fuselage, and tail, yet the plane was not seriously damaged and landed easily.

S/Sgt. J. G. Fry (pilot) and 2d Lt. Carl Ashline (his observer) came in with 70 holes in their plane—holes put there by our own flak while the Air OP was being chased by two enemy fighters. The medics dug an AA fragment from Lt. Ashline's back. Sgt. Fry picked a piece of jagged steel from the shoulder of his flying jacket.

Lt. Floyd Leming, pilot, and Lt. Robert Savage, observer, were forced to bail out of their plane when an enemy fighter shot off the wings. Both officers apparently drifted down behind enemy lines.

S/Sgt. Pauksta was flying a major on a conduct-of-fire mission. S/Sgt. Stegall and S/Sgt. Crosby were in a lookout ship. The two planes were attacked simultaneously from above by 2 Me-109s. S/Sgt. Pauksta's plane was hit by a 37-mm shell; the left strut was damaged and holes were torn in the fabric. S/Sgt. Stegall's plane was hit with .50-cal. MG fire in the wing, but no serious damage was suffered. When the Me-109s attacked, the Cubs dived and were able to recover, from the dives and elude the Germans. As the two Cubs pulled out, however, two more Me-109s, which were at a lower altitude, made another attack. Again the artillery planes were able to outmaneuver their assailants and escape. Both Cubs

returned immediately to their landing strip, without damage to personnel.

Near the scene of this double-decker dogfight S/Sgt. Martin was flying on another mission. The first two Me's to pick on Pauksta and Stegall next turned their attention to him. He outmaneuvered the Germans by flying toward the center of the circle they were making in their attack, gradually working down his altitude and edging over toward the American lines. So dumbfounded were our ground troops that they never even drew a bead on the attackers—but the threat of their fire was enough for the Nazis, who finally let Martin go rather than follow him within .30-cal. range of the ground.

S/Sgt. H. G. Waddell, with his mechanic, T/3 R. D. Cannon, were attacked by an Me near Alano. Their plane was damaged but did not crash.

Sgt. Norman B. Baylor experienced a narrow escape. Attacked by 4 enemy fighters while adjusting fire, he was forced to dive his ship behind a mountain on the enemy side of the lines. This foiled the fighters, but the enemy AA opened fire on his plane almost immediately. With a bullet hole through one cylinder, Sgt. Baylor coaxed the plane around the mountain and made a forced landing inside our lines. Working under enemy fire, the ground crew saved the plane.

S/Sgt. E. V. McClelland was shot down near Rocca Evandro. Four Me-109s came in just behind a flight of Spitfires. Two attacked from above and two from below. McClelland made a crash landing on the side of a mountain with the tail surfaces of his plane on fire. He was not seriously injured.

## CONCLUSIONS

Besides naval spotting and counterbattery missions, Air OPs have done successful work in hasty registration, in surveillance of scheduled fires, in destruction of enemy materiel, truck parks, and dumps of various sorts, and have brought down numerous concentrations on enemy personnel. This is the type of mission the Air OP was meant to do. These are primary missions.

The mountainous terrain encountered so far has usually made the Field Artillery School practice of flying over friendly artillery positions at 600' to 1,000' impracticable, even though this remains the ideal solution. Risking trained pilots and observers and their planes over enemy lines or at considerable altitudes can only be justified by operational necessity. If risks are necessary in order to carry out primary missions, however, these risks must be run.

Secondary uses of Air OPs are being cut down in the Fifth Army, in order that the battalions will have air observation when required. In critical stages of a landing, in a rapidly moving situation, or when units are operating on wide fronts, secondary missions are often of such great value to the whole command as to outweigh the interests of the Field Artillery. If corps liaison squadrons are ever provided by the AAF, it will have been the artillery Air OPs which proved the value of light planes to division and higher commanders.

Air OPs have not only done all that those who planned them hoped they would—they have done vastly more as well.

# ... IN NEW GUINEA

By Capt. Robert M. White, II, FA

It took only one campaign to prove the value of L-4-Bs (Cubs) for artillery air observation in the jungles of the Southwest Pacific Theatre. We had feared that the dense overhead cover of the steaming swamps and rain forests, which placed definite limitations on all other types of aerial observation, would neutralize the value of the Flying Jeeps—but not so. While the slow- and low-flying Cubs were not perfect, they were the next thing to it according to the record they piled up in their first campaign, the Nassau Bay—Salamaua show which ended in the simultaneous capture of Lae and Salamaua in early September, 1943.

Early in the show Cubs had been available, but personnel trained in artillery observation from them had not. The Cubs were used as flying taxis for important and/or wounded personnel, flying trucks for limited quantities of critical supplies, etc. But with the arrival of Capt. Edwin H. Leer and his air liaison party the picture rapidly changed. The Cubs began killing Japs.

The operational area of the Cubs' first campaign was bordered on the east by the tortuous beach reaching north from Nassau Bay to the swampy shores of Salamaua. Inland were the broken hogbacks of the northeastern Bowutu Mountains. These jagged, precipitous ridges, which rose over 3,000 feet, were well covered with heavy rain forest broken only by occasional patches of kunai grass. Ground action in the area was canalized along the limited, twisting, muddy native tracks.

The seizing and holding of commanding features was the dominant tactical motif. Infiltrations (by both sides) were at all times rife. In short, it wasn't a campaign which featured the maneuvering of large bodies of troops. The terrain precluded such. Rather, it was a bitter battle of small units working in tremendously difficult terrain. But, as in all other operations since the day of Napoleon, when the going got tough, when the Nip was dug in and waiting to be stormed, the infantry called for artillery. And when the Nip artillery was blasting our lads, or when enemy barges got too cheeky, the Flying OPs went into action.

Initially the Cubs were experimented with in directing close-support missions. However, the thick overhead cover soon proved that the forward observer was the best solution for such missions in jungled terrain. Other than these few experiments, the Cubs were used almost exclusively for counterbattery, targets of opportunity (such as enemy barge concentrations), and other "long range" shooting.

The first mission given Leer's group was counterbattery. An enemy piece (or pieces) was having a field day duck-shooting our barges moving supplies up the coast to our forward troops. Continuous ground observation had failed to locate the enemy position. It was decided a trap would be set. Col. G. P. Cochran of the artillery was in on the planning, which called for one of our barges to act as a decoy while one of Leer's planes flew into a position from which it could observe the terrain probably harboring the enemy guns.



The decoy barge set out to sea, rounding a protective point of land and plying toward our forward shore positions. Overhead circled the Flying Jeep with S/Sgt. Glenn E. Case as pilot and S/Sgt. C. W. Guy as artillery observer.

Suddenly the enemy opened up. His first shot was over, the second was short, and the third one burst immediately in front of the barge. The lads on the barge were probably sweating it out plenty, but without reason. Sgt. Guy had spotted the flash of the enemy gun on its first round, and as the Nip let go his third round directed an entire battalion of 105s into the position. After that our barges had no more trouble from enemy artillery in that particular area.

Further experience soon established that the Cubs were most successful when the mission was planned ahead of time. For example, the Nip had a good deal of ack-ack in Salamaua. Our air strikes were constantly working the place over, but not without a good deal of "bother" (as the Australians say) from flak. Since Salamaua was within range, it was decided to see what help our artillery could give by way of discouraging the Nip ack-ack.

The Air Corps would notify our artillery when a strike was pending, and shortly before it was due a Cub would be sent up to direct our harassing fire. The plan worked well, with the Cub moving our fire from enemy position to enemy position as each went into action. To say the Air Corps was appreciative would not be an overstatement.

Incidentally, throughout the campaign every effort was made to give the Air Force full cooperation. Besides neutralizing ack-ack the Cubs were frequently used in the rescuing of Air Force personnel. By the end of the show our Cubs had been directly instrumental in the saving of 32 pilots and crew members of crashed planes.

The Air Force in turn assisted the Cubs in many ways, not the least of which was driving off hungry-eyed Zeros. Shortly after the Cubs were first used for Flying OPs the Jap associated them with the accuracy of our artillery and set out to get the Cubs. When we had no fighter cover our pilots, when attacked by enemy fighters, would usually try to dive as low as possible and circle slowly toward our own ack-ack. Despite several determined attacks we did not so much as have one of our Cubs holed by enemy fighters.

At first the Nip used his ack-ack on the Cubs, but soon learned that if his opening rounds were not successful our artillery, directed by the Cubs, would make the whole business not worth while. Since the Jap hates our artillery more than anything else, toward the end of the show he pretty much let our Cubs have their own way.

Once the Nip brought in two .50-cal. machine guns and set them up on a point of land over which our Cubs passed every day. He was just getting these guns dug in and probably gloating a little over what they would do to our Flying Jeeps when one of our pilots returning from a mission spotted them. As may be expected, the pilot reported the enemy's new position and in less than 10 minutes had 105s combing the area. The 50s were never used.

The Air Liaison party used during the campaign had 5 L-4-Bs and included, beside Capt. Leer, 4 sergeant pilots, observers, and maintenance men. Mostly they operated from hastily constructed strips varying in length from 150 to 300 feet. Most of these strips were built with matting along beaches.



*After use as a motor park this olive grove is a welter of tracks. Muddiness of the countryside is evident from the depth of the ruts. Note that slit trenches were dug; those in the foreground appear plainly.*

During the 2½ months of the campaign Leer and his men flew a total of 956 hours which, by Air Corps standards, is phenomenal.

Despite the wear and tear of constant use in tropical conditions, maintenance was at all times excellent for the Nassau Bay party. This was vitally important, for the terrain over which they were flying was not favorable for forced landings. Setting a Cub down on top of a rain forest would be a particularly dangerous job and the only other places available were the shark-infested sea, beaches, and kunai patches. Landing on the sea or a beach needs no elucidation, but landings in gunai patches are difficult to visualize unless you are familiar with this heavy tropical grass which grows to over 12 feet in height. Landing in this grass when it is over 5' high is pretty much a cinch to nose-over. On the other hand, the very heaviness of the grass which makes for the nose-over cushions the crash, making injuries infrequent.

From the point of view of the Artillery Commander Cubs are too damned useful in jungle operations. If you don't fly you walk or use tediously slow barges in any movement. Roads are as rare as beer, and if you have them they are usually bogged by the intermittent rains. This being the case, everybody and his orderly wants to borrow your Cubs for "a very important job." All of which is perfectly all right, except you can't use Cubs for an OP when they're out on another mission which adds further wear and tear on both the men who fly them and the machines themselves.

And it isn't easy to keep from lending out your Cubs because "a very important job" will usually be exactly that—for example, the rescue of men from a crashed plane, fast travel for brass or wounded personnel, terrain reconnaissance, patrolling, and ad infinitum.

In one incident during the Nassau Bay—Salamaua show a Cub was actually used for "top cover." The tactical picture placed our troops on the edges of Salamaua waiting to attack as soon as other allied forces attacked Lae, through which ran the only route for the Jap to escape from Salamaua.

Just as the Lae show was getting under way it was found

that the Jap might have evacuated Salamaua. No one was sure, however. (If you do not know Jap fire discipline and camouflage, such a situation may be hard to visualize.) Our forces slowly pushed in toward the town while 3 barges with assault troops were dispatched for a diversionary landing on the beach in front of the town itself. The barge-borne outfit would need plenty of help if the Jap was waiting, so it was decided to use a Cub for "top cover"—our artillery being registered on a base point near the beach, the Cub would fly in with the barges and direct fire in case of opposition. Undoubtedly the idea would have worked, but no opposition was encountered.

In only one incident during the campaign were the Cubs used in a close-support mission. That was on 29 Aug when our infantry stormed Lokanu Ridge, a precipitous razor-back rising

to about 3,500 feet. The enemy were well dug in on top and our troops were forced to scale the side of the ridge in a frontal attack. Obviously, artillery and plenty of it was imperative if our infantry was to succeed.

Forward observers had attempted to direct fire on the enemy positions, but without success because of the steepness of the ridge. Leer was called in and S/Sgt. Edward E. Baker was assigned to fly the mission. The Cub had to climb to over 2,500 feet in order to observe for the ensuing shoot which paved the way for a successful ground assault.

Leer received his Air Liaison training at Fort Sill, graduating in December, 1942. Relative to the training program given there at that time he reports, "I have no suggestions to make. It is an excellent, well-grounded preparation for the job the boys will have to do over here."

## ... IN ITALY

By Lt. N. S. P. Stitt, FA

Although this article is of course only one man's observations and opinions, it is based on 70 combat missions and nearly 100 hours as an air observer in combat over Italy. Since I can only describe what I have seen this article is limited to the current fighting in Italy, and deals principally with a mountainous region. The time it covers is from the end of November till the present, and the fighting from Mt. Camino to the Rapido River and Cassino.

No longer is it necessary to sell the Piper Cub to artillerymen. To those in action they have many times over proved their worth. They do not and can not take the place of ground observation but, properly used, they do greatly amplify and complement it.

We are, or were, part of a brigade, but the same methods of administration and tactical use of air sections hold true for divisions or groups. It is much better, for instance, to have all units working together from the same field and under control of the Air Officer of the parent unit. In that way a central mess can be established and patrols and information shared. The battalions, however, do not lose control of their planes. They can

send them up as they desire on reconnaissance and special missions (such as base point or check point registrations) at any time. Normally most of the shooting is done through one's own organization. The Air Officer simply correlates all flights and information and prevents having two planes up on patrol at the same time.

I was fortunate enough to make the first flight as observer for my battalion and have remained at the field ever since. It seems much better to have one assigned battalion air observer, (though other officers may make flights as the need arises) who lives at the field with the pilots. Some battalions rotate their observers every few days, but the officer who does nothing but fly and observe has a terrific bulge on the others that pays off when there is shooting to be done. He is much better acquainted with the terrain and usually quickly becomes a very good shot using air-ground methods. He and the pilots form a team. They become used to working together, developing mutual confidence. It is *not* a good idea to send up the pilot alone: it is too much for one man to fly, shoot, and keep an eye out for Jerry planes at one and the same time. Often it is too much for two men!

Above I mentioned that we fly patrols. That is not the old school teaching, but it is exactly what we do. Each battalion takes about an hour and a quarter patrol one or more times during the day, depending upon the weather and Jerry activity or lack of it. During that time they look for targets of opportunity, very frequently finding them—usually ones that are defiladed or out of view of any ground observers.

And, contrary to original teaching, we do not fly behind our own gun positions. We fly wherever we can accomplish our mission—to observe. That is generally over or near the front lines. Before we got combat wise we flew as far as 8 miles into Jerryland. That, we found, was not too good an idea. Now we stick to where we can get the maximum observation with minimum risk—over our doughboys.

The altitude at which we fly depends greatly on the terrain. At first, back in the mountains, we usually flew at 6,000 to 8,000 feet. Now, as we are out over a valley, we range from 2,500 to 4,000 feet. Observation is good from there. One can see any vehicular movement and pick up gun flashes. In



*A final check-up is made by a "grasshopper" team, Lts. Elmer Von-Eigen and Paul F. Harsfield.*

any case Jerry is always well camouflaged and does not indulge in much daylight movement on his roads. It is impossible to detect gun positions unless the guns actually fire. Our pilots never fly an even course and constantly vary their altitude to discourage Jerry ack-ack.

When the Germans see our Cubs up they generally stop shooting if it is at all possible. From painful experience they fully realize how well we can pick up their fire and quickly adjust on it. As for their anti-aircraft, they will quite often try a couple of rounds with their 88s hoping for a lucky hit. They seldom throw up concentrations of flak, for if they miss we can bring counterbattery on them speedily and effectively.

Their answer to Air OPs is to put in a call for Me-109s or Focke-Wolf 190s. It is a very effective answer unless we see them first. Several days ago we were chased down five times during two missions. As soon as we spot an enemy plane we go all-out for the base of the nearest mountain and get in its shadow, but watching out at the same time that there be not another Jerry plane waiting for us below. That is a little trick of theirs.

I fly riding backward, and believe it brings much greater security. Several times I have spotted German planes that the pilot had not seen. If we see an enemy or unidentified ship we immediately send that information by radio to the net control station. In turn AA units, forward observers, and such report all enemy planes, and net control warns us that they are near.

As an interesting sidelight we can testify that Cub wings will stand a lot of punishment. Not long ago a Focke-Wolf jumped us. We headed for good old Mt. Trocchio, zigzagging as we dived. The Jerry followed us nearly to the ground, guns flaming, and pulled out when only four or five hundred yards behind us. When we got back to the airfield and stopped shaking I asked Lt. Bauer, the pilot, if he had noticed how fast we had been diving. He said he had glanced at the air speed

indicator and when he saw it go beyond 180 stopped looking and started praying!

Our radio communication has proven excellent in combat. We use one channel for our own battalion, the other for that of the parent organization. Such missions as BP registrations we fire on our battalion channel. While looking for targets of opportunity we use the channel of the net control station; thus all units plot targets which we report. If it happens to be a target on which our

own battalion can not fire the S-3 or counterbattery officer of the parent group assigns us another battalion so we are able to fire the mission with no great delay.

Perhaps the most spectacular use of the "Grasshopper" has been on moonlight missions. This writer does not know who, or what unit, made the first moonlight hop. He does know that the ones we have made have been very satisfactory and worth any risk involved. Take-offs and landings are a little tricky, particularly on rough ground. Gasoline burning in

cans works satisfactorily to mark the field.

Moonlight affords enough definition of the terrain to make location of enemy gun flashes possible and to send down coordinates that will land an initial round close enough to get a quick and accurate adjustment. On our first flight at night we caught Jerry completely by surprise and my report of the mission read:

"Night combat mission flown by moonlight with S/Sgt. T. Crabb from 2130 to 2330 hours looking for targets of opportunity for the YZ FA Brigade. Such targets were readily picked up despite a heavy ground haze. Adjusted XAB FA Bn on 4 targets. First 3 targets were enemy batteries on slope of mountain NE of Cervaro. At least 16 and perhaps more guns located there. After initial Bn fire for effect, Brigade came in with time on target at 2310 hours, firing two brigades. The effect was terrific, one burst causing an explosion with flames leaping 200 feet in the air. Last target fired upon was one gun and fire was effective."



*Venafro, like Cassino, is a town nestled tight against a rugged mountain that rises abruptly from the valley floor. Stone buildings became excellent nests of resistance, and the heights furnished commanding observation and splendid mortar positions. This view is from the south.*

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## ABC METHOD OF MASS TANK FIRE

By Capt. Sydney S. Combs, FA

In order to mass the fire of a tank battalion, company, or platoon, it is necessary to have the guns *pointing in the right direction* with the *correct elevation*.

The assault gun officer of the battalion can adjust his gun (75 or 105 How) on a target. He can then use a time shell (M-54) and put an air burst high over the target, so that each tank by using the time shell air burst can get his gun *pointing at the target*. By having one tank shoot a round out at the range

determined by the assault gun, the tank can be adjusted on the target with an *adjusted elevation* of, say, 80 mils. If all tanks set that elevation on their quadrant and shoot at the air burst for deflection, they will hit the target. The air burst can be shifted right or left by the gunnery officer in order to keep the tanks accurate for deflection.

The artillery can also help by putting high air burst over target when necessary.



# 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 AGAINST JAPAN (21 Feb to 18 Mar 44)

All dates shown this section are local dates. USN communiques in some cases give west longitude dates for east longitude places. Where this occurs the Navy date is one day earlier than the local time.

### SOUTHEAST ASIA

At the north and south extremities of the long India-Burma border, the Allies have been continuously aggressive. The British in Arakan (along the coast of the Bay of Bengal) have been attacking, and have made small gains. A China-American force in north Burma has steadily advanced during the period, in its mission of covering the extension of the Ledo road. Toward the end of the period the Japanese started an offensive against the center of the long front, with a view to penetrating it.

#### *Arakan Campaign*

It will be remembered that operations commenced on 4 Feb by a Japanese turning movement which partially enveloped British forces holding the left of their line. When this account

opens these units had been nearly disengaged.

The Japanese line extended from the vicinity of Maungdaw on the coast, across the Mayu Mountains to Buthedaung on the Mayu River, thence southeast to Kyauktaw in the Kaladan valley, all inclusive. The British were attacking southward on both sides of the Mayu Mountains, with main effort on the east side. Continuing these attacks, by 24 Feb they had cleared Ngakyedaung Pass, through which had run the British line of communications to their troops east of the Mayu Mountains until the Japanese offensive captured it. During the nearly three weeks the pass was held by the enemy, the British forces to the east thereof had been supplied by air and by extemporized trails to the north.

The British continued to press southward, crossing the road through the pass. Another British force advanced down the Kaladan valley and attacked Kyauktaw. This was taken on 25 Feb. The British continued on southward.

Very confused fighting followed until the end of the period, with both sides making occasional small advances but with net results in the British favor. On 11 Mar the British captured Buthedaung. At the end of the period they had in places crossed the direct road from Maungdaw to Buthedaung in the Mayu Mountain area. The final line was Maungdaw (Jap)—Buthedaung (Br)—Kyauktaw (Br).

The terrain in this area contains jungle-covered mountains, with swamps along river lines and the seacoast. Roads are few and contain many bridges, vulnerable to demolition. Transportation is a serious problem. At this season it is dry and extremely dusty. Cross-country progress is necessary to get around road blocks, and this kind of operation requires cutting of trails, etc., and so takes considerable time.

#### *Ledo Road Campaign (Hukawng Valley)*

At the beginning of the period a Chinese force plus an American group occupied in north Burma the area including Taro on the upper Chindwin River, to positions 8 miles east and south from Taipha Ga in the lower Hukawng valley.

The mission of the Allies was to cover the construction of the Ledo Road, which was being extended from the railhead at Ledo (in India) eastward toward an eventual connection with the Burma road. Main effort was to advance up the Hukawng valley, at the head of which lie the Jambubum Hills which separate this valley from the Mogaung valley which extends southeastward from the divide.

As this period started the China troops, which were American-trained and -equipped, were advancing up the Hukawng



By taking Buthedaung (1) the British gained control of both ends of the Buthedaung—Maungdaw road and also took another step toward Akyab, to the south. Amphibious raids have been reported on the plain below Maungdaw (2). In northern Burma joint American and Chinese forces drove the Japs down a road south of Walawbum (5). In the center the Japs began to move toward Imphal, through the Chin Hills (3) and via the Kabaw valley (4).



valley against constant opposition. The country is rough, with much jungle. On some days not over a mile was gained. The American unit (under Brig. Gen. Frank Merrill) cut across country toward a position south of the enemy. This American force had pack trains with Missouri mules. They were further supplied by air.

On 4 Mar the China troops attacked the enemy at Maingkwan, while the Americans attacked Walawbum, about 15 miles further south. Both places were captured and an estimated enemy force of 2,000 men was reported encircled between them. The China troops then started south, driving the enemy against the Americans, one portion being on each side of the valley.

The retreating enemy fired an artillery preparation against the north and east sides of the American position during the night of 6/7 Mar. Japanese infantry then attacked and were repulsed with reported heavy losses. Some of the Japs seem to have succeeded in passing around. The Chinese moving south reached Walawbum on 8 Mar, when the southward advance was continued.

At the end of the period the Allies were at the head of the Hukawng valley, with the enemy holding the Jambubum divide (or saddle) leading into the Mogaung valley. The Japanese are believed to have lost some 4,000 men. Allied casualties are described as comparatively light. The gain for the period has been some 40 miles, or an average of about 1½ miles per day. This is probably faster than the Ledo road can be built. In the direction of Taro the front has been pushed to a line 14 miles to the southeast, covering the trail to Walawbum.

#### *Manipur Campaign*

The Japanese commander in Burma, noting that the Allies had engaged in major operations at the ends of an extended line (600 miles long in a direct line, and longer over available lines of communication), decided to attack the Allied center. Subsequent events indicate that long preparations must have been made, but the first enemy movements were reported on 13 Mar. Five enemy columns were discovered converging on the India state of Manipur.

Manipur is the state which invented the game of polo; otherwise it is generally unknown. It is about the size of New Jersey, its population less than half a million. It consists of a fertile valley, estimated at 650 square miles, and 7,800 square miles of jungle-covered mountains. Its south boundary (100 miles long) and its east one (150 miles long) adjoin Burma.

Two Japanese columns advanced northward to cross the south boundary in the Manipur valley, headed toward Imphal, an overgrown village which is the capital of the state. At the end of the period this hostile force was 95 miles south of Imphal. Two other enemy columns were advancing across the east boundary and were 55 miles southeast of Imphal, coming over the hills from the Kabaw valley where the enemy had assembled. The fifth enemy column was also crossing the east boundary over the hills and was 95 miles northeast of Imphal but headed west. British troops in contact with all columns were not in sufficient force to stop any of them.

The probable objective of this Japanese offensive is to reach the Assam & Bengal RR which, running nearly parallel to the India-Burma border, is doubtless the main line of supply to the China-American force in north Burma. This railroad is less



than 100 miles west of the Burma border which the enemy has reached. There is a good road from the railroad to Imphal. From there an improved old road extends southward to Tiddim, which place the advancing enemy has already passed.

The Japanese project seems to be an ambitious one. It is strategically sound, provided they have sufficient means to reach their objectives. As to this there is no information at date of writing.

#### NEW GUINEA

At the start of the period an Allied force was moving westward along the north coast of New Guinea. The main body was near Saidor and the leading elements near the Mot River.

This expedition has continued to move west. It has met only minor opposition. Principal cause for delay appears to be the tropical terrain, covered with jungle and devoid of roads. The Mot River was crossed on 24 Feb, the enemy retiring to Mindiri, about 22 miles beyond Saidor.

On 6 Mar an amphibious expedition was landed about 10 miles on the far side of Mindiri, near Yalan. No opposition appears to have been met. This force moved both east and west. On 7 March Ribbi (Bibi on some maps) was occupied. Mindiri was now cut off by coast trails, with Allied troops on both sides of it. It fell on the 8th. When the period ended, the Allies held the coast to a point 40 miles west of Saidor.

In the Ramu valley an Australian force which for long has been moving northward toward Bogadjim, is still reported in the mountains to the south of that objective.

#### NEW BRITAIN

The beachhead on the south coast at Arawe (held by the Army) and another on the northwest coast at Cape Gloucester (held by Marines) have made contact. The western part of New Britain has been abandoned by the enemy, less small reconnaissance patrols.

On 7 Mar, against light opposition, Marines from Cape Gloucester landed near Talasea on the north coast. This had been an important enemy base but appears to have been nearly abandoned.

The line at close of the period was the Willaumez Peninsula on the north coast (held by the Marines), thence southwest to the south side at a point some 25 miles east from Arawe.

An almost daily intense bombing of Rabaul has continued during the entire period. From 100 to 200 tons of bombs are

dropped at a time. From air observation it appears that the enemy is still holding, for his planes are being reported destroyed on the ground and others as shot down in the air. A very large number of enemy barges are reported as sunk.

Rabaul is being constantly blockaded by sea and air.

#### NEW IRELAND

Air and naval operations against this island, particularly against the Jap base at Kavieng (at the north end), have continued. Kavieng is blockaded and frequently bombed.

#### ADMIRALTY ISLANDS

These islands are about 200 miles north-northeast from the Madang coast of New Guinea. They belong to Australia, as a mandate, and were occupied by the Japanese in January, 1942. Japs established an advance sea and air base at Lorengau, with main airfield on Los Negros Island 10 miles eastward.

Manus is the principal island of the group, being about 50 miles long from west to east and some 20 miles broad from north to south. Lorengau is at the northeast end. The water passage between Manus and Los Negros is only about 100 yards wide. The area of operations is low and flat, with much jungle and swamp.

On 29 Feb elements of the 1st Cav Div, dismounted, landed at Hyane Harbor on the east side of Los Negros, just north of and adjacent to the enemy's Momote airdrome. The entrance to this harbor is shown on charts as only 50 yards wide. Notwithstanding, there was little opposition and our troops occupied the airfield after overcoming what appeared to be only the local guard.

The landing had been intended to be a reconnaissance. When it was found that the enemy airfield fell within a few hours, Gen. MacArthur (who was present) directed the airdrome be held. He ordered additional troops sent. These arrived two days later, on 2 Mar.

Next day the enemy, having brought troops over from Lorengau, counterattacked. A severe fight continued throughout this and also the following day. The Japanese were

everywhere repulsed. By 6 Mar Los Negros Island had been cleared of the enemy and the Momote airfield was in use by American forces.

Preparations were now pushed to capture Lorengau, the only regular station the enemy had left in the Admiralty Islands. On 13 Mar troops landed without opposition on Hauwei and Butjo Luo—small islands about a mile off the north coast. On 17 Mar our troops (having crossed the narrow passage between Los Negros and Manus) advanced on Lorengau. The batteries on the small islands had an enfilade fire on enemy positions to the south. With this help the Lorengau airdrome was occupied that day, and the troops arrived within 600 yards of the village of Lorengau.

The Japanese resisted strenuously. Against their strong opposition, American troops forced their way into the town on the 18th. On 19 Mar they completed the occupation, the enemy retreating to the hills to the south.

American occupation of the Admiralty Islands completes the plan for isolating the enemy still in New Britain, New Ireland, and in the Solomons. It gives the Allies new air bases to improve the already existing air and sea blockade against the remaining Japanese positions in this area.

#### THE SOLOMON ISLANDS

The general situation has remained unchanged. The Allies hold an extensive beachhead around Empress Augusta Bay on the west coast of Bougainville. Japs hold bases at Buka off the north end, at Buin and Faisi at the south end of Bougainville, and also Choiseul Island southeast of Bougainville.

The Allied plan apparently has been to await the collapse of the enemy through the sea and air blockade which is in force. In connection therewith the enemy bases are being bombed constantly. An active sea and air patrol is maintained against enemy barges. A large number are reported as being sunk. There is no information as to how many, if any, get through the blockade.

On 8 Mar the Japanese made a strong attack against the northeast sector of the Empress Augusta beachhead. It had considerable initial success, captured some artillery OPs on hills, and arrived so close to the airfield that it became impracticable to use it. Most of the fighting appears to have been in the jungle. At the end the lines were close to each other.

On 10 Mar, American troops counterattacked. In a 6-hour fight they recovered the OPs and cleared the airfield from enemy observation. Due to the jungle and the close fighting, some reports suggest it may have been conducted without direct artillery support. As the losses are reported as 11 Americans killed and 50 Japs killed, this action was not a major one.

Fighting continued in this sector with alternate offensives and defensives until the 16th, when the sector resumed its former comparative quiet.

#### CAROLINE ISLANDS

Operations have been limited to bombing by Allied planes. The two islands most bombed have been Ponape and Kusaie, each twelve times. Urolok has been bombed thrice. Ponape and Kusaie are the enemy advance air bases which are nearest to the Marshall Islands.



*American Marines cleaned up New Britain's Willaumez Peninsula (1). Air attacks on Rabaul (2) find less and less shipping there. In the Admiralties (3) our 1st Cav Div (w/o horses) captured Lorengau airdrome on Manus Island after cleaning up the small offshore islets to the east. Many Jap planes have been downed over Wewak (A on inset). Little damage was done by the first Jap air raid on Eniwetok (B). Our planes have been active as far north as Wake (C).*

## MARSHALL ISLANDS

At the beginning of the period the American attack on Eniwetok was almost completed. It was finally accomplished by the capture of Parry Island on 21 Feb. American losses for the entire operation are reported as having been 150 killed and 350 wounded.

Other operations have been limited to bombing of atolls still held by the enemy, with occasional shelling by naval vessels. Excepting a single day, these atolls have been bombed daily. As the islands are all small and low it is believed that this action will gradually cause the enemy's forces there to disintegrate.

## MARIANAS ISLANDS

A naval task force (under Rear Admiral Marc A. Mitscher) on 23 Feb launched an air attack of about 200 planes against Tinian, Saipan, and Guam. The first two islands were attacked twice. The enemy's air reconnaissance had discovered the approach of the task force on the 22nd. This resulted in an air attack against our ships during the night 22/23. One of our ships was reported as having sustained some damage, but this did not interfere with the air attack on the following morning.

The results of the attacks on the islands are given as 29 enemy planes downed in the air (as against 6 own planes lost) and 87 enemy planes destroyed on the Saipan and Tinian air fields. One cargo transport and a patrol boat were sunk and 9 other ships and boats were damaged.

The three islands bombed are the main enemy sea and air bases in the Marianas. These islands are of the volcanic type, and have mountains, hills, and considerable cover. Their size is many times that of the Marshall atoll islets which have been taken by our forces.

## NORTH PACIFIC

Wake Island has been bombed by American forces twice (on 29 Feb and 12 Mar). The Japanese Kurile base at Paramushiru was bombed on 3, 7, and 18 Mar. These operations probably have been partly for reconnaissance purposes.

## COMMENT

The newly-captured bases of Kwajalein and Eniwetok in the Ralik (or West) Marshall Chain are reported being remade into forward bases. Each base is to have bomber and fighter air fields and large dumps. Ships are to be handled in the lagoons, where the water is practically always smooth.

From Eniwetok the enemy bases at Ponape and Kusaie are 362 and 362 miles distant. Truk is 379 miles beyond Ponape, while Wake is 594 miles away.

From Kwajalein to Kusaie is 361 miles.

## TARAWA (PRIOR TO 20 FEB 44)

An official report since received enables certain corrections and additions to be made to the account appearing in the February issue of this JOURNAL, relating to operations at Tarawa last November 21st and succeeding days.

In addition to the barrier reef which was mentioned, the island Betio had an inside fringing reef, without passages through it and negotiable by landing boats only at high tide. This occurred at 0830 hours and is the reason why the attack was launched at that time.

The first three waves of Marines passed over both reefs and landed on schedule. It was the fourth and fifth waves which grounded. The first three waves had equipment to shuttle back and forth for reinforcements, ammunition, water, and supplies.

The Japanese had a 6-inch battery at the west end of the island in addition to the 8-inch battery mentioned, and had the same caliber batteries at the east end.

Occupation of the wharf by the enemy on 22 Nov is denied. It now appears that the Marines never lost it. The presence of the enemy on a wreck in the harbor is stated to have had no influence on the general action on 23 Nov.

A revised list of casualties suffered by us is

Killed .....	1,026
Wounded .....	2,557
Total.....	3,583

## THE WAR IN ITALY (21 Feb to 18 Mar 44)

The general situation has not changed during the period. The Allies hold a beachhead about the small fishing ports of Anzio and Nettuno, and that part of the Italian peninsula southeast of a line extending from the Gulf of Gaeta on the Tyrrhenian Sea to near Ortona on the Adriatic. At neither place has there been any substantial change in the front.

### THE ANZIO BEACHHEAD

The beachhead's perimeter at the start of the period was **a point on the coast 10 miles northwest of Anzio, thence due east to a point 2 miles southwest of Cisterna, thence due south to a point on the coast east of Astura and 7 miles from Nettuno.**

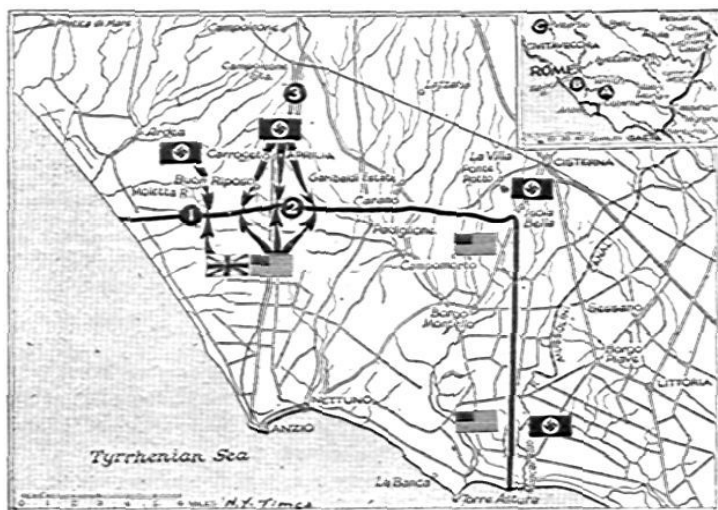
Anzio and Nettuno are connected by a continuous beach suitable for landing supplies. As the harbor can be used only by small craft, transports lie offshore and transfer supplies to landing craft. There is good anchorage.

All parts of the beachhead are subject to enemy artillery fire, the maximum range to most distant areas (the beaches) from German batteries being about 21,000 yards. German artillery reaches the anchorage. The enemy has maintained a daily program of harassing fire over the beachhead, with special effort against supply installations in and about the beaches.

This has been supplemented by occasional and irregular bombings, principally against ships and landing facilities. A few attempts against shipping have been made by enemy motor torpedo craft.

Italian-manned planes and motorcraft have been identified in this sector. Some of the prisoners taken on shore have been Italians in German uniforms and serving within German divisions, so it appears that the enemy has succeeded in raising some Italian forces. An estimate by a Swedish correspondent as of last January was that 50,000 Italians were serving under or with the Germans. To date no important number have appeared in line.

Just prior to the commencement of this period the enemy had a made a major attack against the beachhead. This had succeeded in gaining some ground. It failed to endanger the beachhead as a whole. As a sequel to that operation, about two battalions of British infantry were north of the perimeter in the area southwest of Aprilia, and encircled by the Germans. This situation led to local fighting, Germans attempting to wipe out the surrounded troops and the Allies seeking



*British troops repulsed a Nazi blow along the upper reaches of the Moleta River (1). In the wake of the failure of his third major drive, the enemy probed Allied positions southwest, south and southeast of Aprilia (2), but was driven back. An official version of the battle line placed the Allies close to the Moleta on their left flank but pulled their right one back. Flying Fortresses and Liberators battered the areas between Aprilia and Campoleone (3) and Cisterna and Velletri (A on inset). Our big bombers also smashed at railway yards in Rome (B) and the Viterbo air base (C).*

to rescue them. The Germans had a small salient on the road from Aprilia to Anzio, which dented the Allied line to a depth of a mile. The width of the salient at the base was 3 miles: the Germans sought to widen, the Allies to reduce it.

The underlying rock in this sector is largely limestone. As is usual in such formations, caves abound. These afforded shelter. Taking advantage of this, the encircled British held out until 27 Feb. By that date relief attempts had failed. The surrounded troops, stated by the Germans as 650 survivors, were reported as surrendering. It is presumed that they had exhausted their food and ammunition. The Germans on their part had not succeeded in widening their salient.

On 29 Feb the Germans attacked the point of the beachhead southwest of Cisterna. This operation may have been intended as a raid to secure identifications. The attackers had better success than they probably expected, for they were able to advance to the limit of their defensive barrage laid down around the raided area. This netted a gain of not quite a mile.

During the following afternoon the Allies fired a strong artillery preparation and then counterattacked. This recovered about 2/3 of the ground lost the previous day. Continuing onward on the morning of 2 Mar, Americans recaptured all of the remaining ground which the enemy still held. Identifications were secured from troops registered as belonging to three different divisions.

During the remainder of the period there were a number of raids by both sides, some of which were accompanied by great artillery activity. Except that they captured prisoners and kept track of the situation, no material change occurred.

#### SOUTH FRONT

At the beginning of the period the line was a point on the Tyrrhenian Sea 3 miles north of the Garigliano River—Minturno (Allies)—Castelforte (German)—San Ambrogio (G)—Cassino (G)—Terelle (G)—Mt. Santa Croce (G)—Alfedena (A)—Castel di Sangro (A)—San Angelo (A)—Toricezza (A)—

**Casoli (?)—Orsogna (G)—point on the Adriatic 3 miles northwest of Ortona.**

Except around Cassino, no important operations have taken place. Most of the line is through mountains. In the higher altitudes there have been deep snows, and in lower altitudes less snow and much mud. Patrol activity and raids by both sides have been maintained.

Cassino is a stone house village, having normally a population of under 7,500 people. It lies on the west side of the Rapido River, which here flows from north to south. At nearly right angles to the river are a railroad and Route 6, sometimes called the Via Casilina. The railroad is south of the village, with the station on the east bank. Route 6, at the southwest corner of Cassino, makes a turn northward through the village and then turns eastward again, crossing the Rapido opposite the center of the village. Both the railroad (double-track) and the road are main lines between Rome and Naples.

Just back of the northwest corner of Cassino, rising steeply, is a hill with two summits about 100 yards apart. The southern one is Hill 165 and the other Castle Hill, so named because there is a medieval castle on top of it.

Back to the southwest corner of Cassino, on Hill 519 is the Benedictine Abbey, reached by a winding and very steep road of loops on the east side of the hill. At the north end of one of the loops is Hangman's Hill, which is a spur on the Abbey Hill.

The terrain immediately south of Cassino is low, and at this season boggy from rains. It is well cultivated and has considerable cover from numerous trees.

At the beginning of the period New Zealand troops held an estimated 1/3 of Cassino at the north end, with the line of communications extending north to Mt. Villa, about 2 miles away. The enemy held the balance of Cassino, the hills mentioned above, and the railroad station across the Rapido. His line of communications was Route 6.

Just prior to the period the New Zealand troops had made a major attack against Cassino. This followed the bombing, shelling, and destruction of the Benedictine Abbey on 15 Feb. It had been supposed that the Abbey was the enemy's main OP and that if it were removed he would be unable to control his artillery fire properly. Subsequent events indicate that the Abbey was not the main OP, for the attack failed as preceding ones had.

From reports of a French force north of Cassino, the enemy's main OPs are on Mt. Cairo, 7 miles northwest of Cassino. This is a bald mountain over 1,500 meters high. In clear weather it has an excellent view around the north part of Cassino, but not over those portions of the village adjacent to Castle Hill and the Benedictine Abbey. This part of Cassino could be covered by enemy OPs to the southwest. German artillery to the northwest and to the southwest, outside of the sector assigned to the New Zealand troops, cross fire in front of the medieval castle and the Abbey in the village. No report from the Allied units south of the New Zealand sector has yet been noted.

No activity worth mentioning occurred until 15 Mar. On this day the Allies started a new attack on Cassino. Whereas the preceding attack had been based upon a destruction of the presumed enemy OP, this attack planned to attack Cassino



directly by a severe bombing and shelling. The New Zealand units were to attack Cassino and an Indian force (already west of the Rapido on the north side of Cassino) was to attack Castle Hill and the Benedictine Abbey, now in ruins.

According to German reports Cassino and the adjacent hills were held by the 3d Parachute Regiment plus a detachment of the 70th Mortar Regiment. These troops form part of the 1st Parachute Division, last reported in line to the east, in the sector of the British Eighth Army. It appears that one battalion of the 3d Parachute Regiment was absent on detached service. The area defended by these troops was less than 1 square mile, and included 2/3 of the village and the hills immediately to the west.

The air preparation started at 0830 and continued until 1200 hours. A large group of distinguished Allied generals gathered at the OPs east of the Rapido to watch the bombing and the subsequent attack. Among these was the commanding general of the Allied Air Forces, Lt. Gen. Ira C. Eaker, who broadcast a description of the battle as it progressed.

It was a warm spring day, with brilliant sun. At H-hour a waves of planes flew over the target and dropped their heavy loads of bombs. New waves followed at 10-minute intervals until 0930 hours, and thereafter at 15-minute intervals. The village of Cassino was the main target; it was slightly over 1,400 yards long and less than 400 yards wide. According to the broadcast from the OP, the bombs were of the largest sizes. The New Zealand troops in the north part of Cassino had quietly been withdrawn prior to the bombing. The bombing was planned to pulverize Cassino and all enemy troops therein. The general broadcasting stated,

"It was by all odds our greatest effort of the war. The German stronghold of Cassino felt the weight of more bombs than Berlin has had on any day. Undoubtedly never in warfare have air forces concentrated so much destruction on a target of comparable size in a single mission.

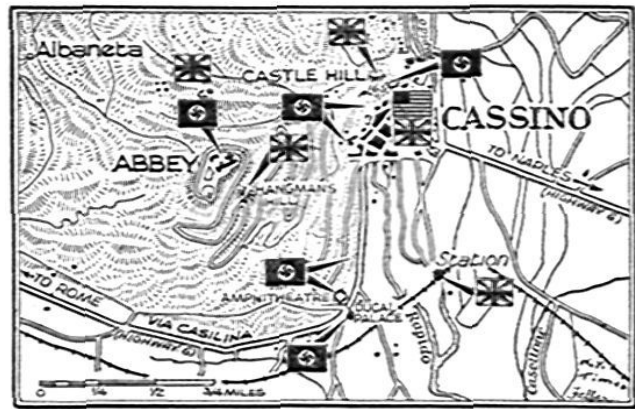
"Observers with me agreed that over one half the bombs were in the target, and the greater part of the remainder, scarcely less valuable, fell on German trenches and gun emplacements nearby."

Reports indicate that the air force in 3½ hours dropped nearly 1,300 tons of bombs on Cassino. Plans had called for over twice this amount, but due to the unexpected arrival of clouds 260 bombers failed to bomb and 75 others were forced to jettison their bombs elsewhere. 278 bombers, or about 45% of the total, reached the target. The foregoing figures apply to the Strategic Air Force; those for the Tactical Air Force are not available. Sorties, however, totalled 1,558.

Following promptly upon completion of the air preparation, the artillery preparation started. Every available gun was used. The length of the preparation was not stated, but seems to have been under two hours. The total rounds fired for all batteries was reported as 85,000. This artillery fire was directed primarily against the approaches to Cassino, and known or suspected positions of machine guns and batteries.

Tanks led the attack, which was pushed during the afternoon, starting at 1400. This attack met strong resistance. Both the India and the New Zealand units made but limited advances by nightfall.

Cassino had indeed been reduced to a mass of ruins. These were so thick that it was impracticable for tanks to get into the area. The infantry were obliged to clamber over piles of rubbish, massive in size. Everywhere they met an amazingly fierce fire from machine guns, while the enemy artillery constantly shelled about everything that moved.



*This map shows various points reported held by the opposing forces and suggests the unusual nature of the battle. Just above the town, for example, British troops controlled Castle Hill, while between it and the Allied-occupied town the Germans clung to Hill 165. Likewise, Gurkha troops maintained their hold on Hangman's Hill, just below the crest of the height where the enemy was entrenched in the ruins of the abbey. The Nazis control part of the road south from Cassino by reason of strong points in the amphitheatre and the ducal palace opposite.*

On 16 March the attack on Cassino and the hills to the west was continued. Progress was made. The railroad station had been occupied without difficulty. The engineers constructed a bridge across the Rapido at Cassino. The Rapido is about 40 yards wide and not fordable. The bridge site was visible to the enemy's OPs. To protect the men working, a continuous smoke screen was established around the working area.

By midday, all of Cassino except the southwest quarter had been occupied. Castle Hill and the adjacent Hill 165 were occupied by India troops, whose advance elements were part way up the Abbey hill, as far as Hangman's Hill. German artillery maintained continuous interdiction fire on roads leading toward Cassino.

At 1330 hours an artillery preparation was fired against the enemy on the Abbey hill. This failed to get the infantry forward. New Zealand troops attempted to move around the south side of Cassino. Their jeeps and other vehicles became bogged in mud, and this attempt had only slight success. It was unable to get around to Route 6 west of Cassino.

During the night 16/17 March the enemy recaptured Hill 165, and established additional posts within Cassino. At daylight these were able to stop the New Zealand troops. A new attack was organized which started at 1000 hours to move southward through the ruins of what had been Cassino.

The enemy recaptured Castle Hill but lost it to a counterattack by India troops. The latter were unable to retake Hill 165. Germans reoccupied the base of the Abbey hill on the south and east sides and thereby cut off the Gurkhas at Hangman's Hill. These troops were then supplied by air, it being impracticable to reach them otherwise.

German self-propelled guns entered the southwest edge of Cassino. At this point there is an ancient amphitheater on the north side of Route 6, and a large stone building, ruined, just opposite on the south side. Just to the east were the ruins of the village hotel—the Continental. Self-propelled guns were emplaced in all of these ruins. With their help the Germans held on to their southwest quarter of Cassino.

The New Zealand troops captured the hotel, but as this account closes the Germans had retaken it.

The final situation was that the Germans held the Benedictine Abbey, less the center of the slope (including Hangman's Hill, held by India troops who were practically surrounded). The India units held the medieval castle on Castle Hill, less Hill 165 held by the Germans. The battle was continuing.

#### COMMENTS

1. It was a general surprise that the intensive bombing of Cassino failed to entirely suppress enemy resistance. The Allies reached the vicinity of Cassino on 21 Jan. An American patrol entered the town soon after. Yet after two months, a very small village has held out against extremely strong attacks.

The original explanation that the enemy's hold on Cassino was due to his supposed OP in the Benedictine Abbey appears to have been unwarranted. The OP was not the cause of the failure to take Cassino.

The explanation made for the enemy's hold after the extraordinary bombing of 15 Mar is now given as due to a system of caves and tunnels in which the enemy is supposed to have taken shelter during the air and artillery preparations.

A few prisoners taken since 15 March, who were in Cassino during the preparations, did not seem to have been particularly influenced by their experience. Apparently German losses had been very moderate, and the garrison had not suffered particularly during the preparation.

More information is needed why a supposedly small enemy force has been able to resist for such a long time.

2. Numerous reports indicate that German divisions have no fixed T/Os. This writer noted this fact in 1941. It was then observed that German divisions in Greece had a different organization than the

same divisions had had in 1940 in France—for example, one infantry regiment instead of three.

The only unit permanently identified with modern German divisions is the headquarters. To it are attached from time to time such combat units and services as the nature of the operations require. When no longer required units are detached and are assigned elsewhere.

Divisions in a quiet sector may thus yield a considerable percentage of infantry and artillery, releasing them to strengthen divisions in active sectors.

When in a narrow sector opposite the Anzio beachhead units are identified who had previously been in four divisions, this does not necessarily mean that all of the four divisions are present. None may be. Their former units were simply transferred to other divisions already in the sector.

3. In Italy—where all enemy divisions are German, speaking the same language, having the same regulations, arms and equipment—this system works well.

It does not work where divisions belong to different nations. This is a handicap of the Allies, who in Italy have Americans, British, Canadian, New Zealand, Polish, French, and Indian troops.

Nevertheless the principle is sound. American T/Os might one day provide for division headquarters to which could be attached any troops desired as circumstances might require. With this system correct identification of enemy units becomes difficult.

4. A large part of the German service of the rear in Italy is being performed by Italians. This particularly includes transportation. For short distances, animal-drawn carts with Italian drivers are employed extensively.

5. Some German regiments are reported as having but two battalions. The third battalion is reported absent as a cadre for the raising of new divisions.

## THE AIR WAR AGAINST GERMANY

The most intense air war has been in progress against German cities, lines of communications, and airfields. The attack against cities is primarily to destroy German production and create disorder among the industrial population. No effort will be made to describe the bombings themselves. The following remarks apply to the bombing campaign in general.

There are over 100 cities in Germany which produce war materiel and which have populations exceeding 50,000 according to latest available census. There are over 60,000 similar but smaller towns. The large cities have a combined population, in round numbers, of 25,000,000, the small towns 22,000,000, in all 47,000,000.

Allowing for unsuitable weather and other factors, if we assume 200 days are available per annum for bombing and that that number of day raids and the same number of night raids are made by not less than 500 bombers per raid, it would take well over a year to destroy the 100 larger cities and much more time to destroy the little ones. Would they remain destroyed? It has been found necessary to rebomb numerous towns. To keep them bombed out of use will require very large forces—even much more than are being used.

This would indicate that not more than a certain percentage of German industry is out of use from bombing at any one time. If it takes three years to destroy all German plants and six months to reestablish them, only 1/6 of the German plants would be out of production at the same time. The solution to this problem from the German point of view is to provide a 120% capacity, of which 1/6 could be out of use.

Statements from persons recently repatriated from Germany are that the Germans have a regular system which transfers workers and materiel from one plant to another immediately after a plant has been destroyed or damaged as the result of an air raid. The Germans are providing (or attempting to provide) for the estimated interference with production from air raids by providing the required excess capacity somewhere in their vast territories.

To provide against damage to railroads from bombing, especially in France, reports are that the Germans have large supplies of extra switches, ties, rails and similar materiel ready to replace interrupted lines. Special section gangs are kept to dash out to sites as necessary. To keep a railroad cut, it is necessary to follow the same plan as the artillery uses for intercepting traffic on roads: *constant* shelling or bombing of interdiction points is required.

## THE WAR IN RUSSIA (21 Feb to 18 Mar 44)

That part of Russia which is north of the Pinsk (Pripiet on some maps) Marshes has been characterized by considerable Russian activity without, however, much change in the line. The general impression as to this sector is that the Russian attacks have been holding operations, intended to prevent the withdrawal of German divisions to other sectors.

Russia south of the Marshes, comprising the Ukraine, has been the theater of a major Russian offensive launched and continued through the second half of the period.

The German armies have remained strictly on the strategical

defensive, and generally (but by no means entirely) on the tactical defensive. This policy is a continuation of that adopted by German GHQ early in August, 1943.

At the beginning of the period Finland opened negotiations with Russia, through the Russian embassy at Stockholm, with a view to an armistice and withdrawal from the war. The Finn proposal to negotiate was accepted by Russia, who on 1 March broadcast the terms she had sent to Finland. The important parts were

1. Acceptance by Finland of the 1940 boundaries. At this date Finn and German troops are everywhere in advance of this line. This requirement would presumably include the return of Hangoe to Russia.
2. Internment of German troops in Finland. If desired, Russian

**troops will be made available to enforce this requirement and will leave Finland as soon as their mission is accomplished.**

**3. Repatriation of Russian subjects (now refugees).**

On 6 Mar Finland replied objecting to items 2 and 3. On 10 Mar Russia answered, refusing to modify her terms (which she stated were a minimum) and demanding a definite answer by 18 Mar. On 17 Mar Finland declined, thereby ending the negotiations.

Negotiations with Italy which led to her changing sides in the war were secret—at least an effort was made to keep them secret from Germany. But the negotiations between Finland and Russia were made public as they progressed, with delays of not over a few days. Germany was consequently aware of what was occurring. It seems at the date of writing that Germany may have instigated the negotiations, in a preliminary effort to break down the "unconditional surrender" formula by leading the Allies into a position where terms would be considered.

From information from the Norway Government in Exile, their agents in Norway report that as of 1 Mar Germany was preparing to withdraw her troops from Finland to north Norway. Such a movement had not commenced and there were at that date no signs that it was imminent. Since the Russian terms as to internment of German troops in Finland had by that time been broadcast it would seem that Germany, while taking precautions, did not believe that there was any danger of the Finns' accepting Russian terms.

Germany's base in north Norway for its troops in north Finland, estimated as 6 or 7 divisions, is at Skibotten. This is near the head of Lyngse Fjord. Barracks for large forces are nearing completion. From this point a road extends eastward into Finland. Reports are that what used to be just a trail has been greatly improved. Snow sheds have been constructed on exposed locations, and the road is considered as available at all seasons as far as the Norway frontier. Its condition beyond the Norway boundary is not known.

The commanding general of the German forces in north Finland (Gen. Eduard Dietl) has been in north Norway, apparently supervising his services of the rear. German garrisons with suitable fortifications have been placed at Tromsø, Harstad, and Hammerfest, to prevent an amphibious expedition from arriving unexpectedly on Gen. Dietl's rear.

Germans in Finland consist of Dietl's army and detached minor elements, principally services and air force units. It would seem that Dietl could retreat into Norway if he so desires. He has taken the precaution to make necessary arrangements to do so, without yet committing himself to this move.

The Finland frontier as a whole has been stabilized. Both sides maintain a patrol service. Raids to secure identifications and intelligence have increased during the period. Air operations, other than usual reconnaissance, have been limited to Russian bombings of Finn cities, including a serious bombing of Helsinki on 26 Feb. That city was partially evacuated as a result.

Operations in Russia south of the Gulf of Finland will be discussed under two sectors, separated by the Pinsk Marshes.

**NORTH SECTOR**

At the beginning of the period the line was

**Narova River—Lake Peipus—Sheltcha (Russian)—Plyusa (R)—Soltzi (German)—Shimsk (R)—Staraya Russa (R)—Sokolovo (G)—Kholm (G)—Utekhina (G)—Novosokolniki (R)—Nevel (R)—Vitebsk (G)—Liozno (R)—Krasnoe (R)—Gorki (?)—Chausy (G)—Rogachev (G)—Zhlobin (G)—Kalinkovichi (R)—Pripet River.**

*End of the Leningrad Campaign*

At mid-January a major Russian operation had been commenced to end the long siege of Leningrad. The main mission had been accomplished; the Germans had withdrawn to the line indicated above. This withdrawal was continuing between Lake Peipus and Vitebsk. The latter place, which is a strong center of resistance, and the Narooova River, were being held and defended.

On 21 Feb the Germans evacuated Soltzi and Kholm, the latter having long been a very stoutly defended place. Much of the territory through which the retreat lay was forest and swamp. Due to an unusually mild winter the swamps were not frozen hard enough to permit wheeled or even caterpillar traffic. This situation limited advances and the forwarding of supplies to roads. It was of great benefit to the Germans. By customary demolitions of bridges and culverts, by liberal mining of roads, and by vigorous rear guard actions, they were able to withdraw their main bodies without great loss. There is some evidence to indicate that this withdrawal was planned long in advance and had been delayed only because the enemy had not attacked in force.

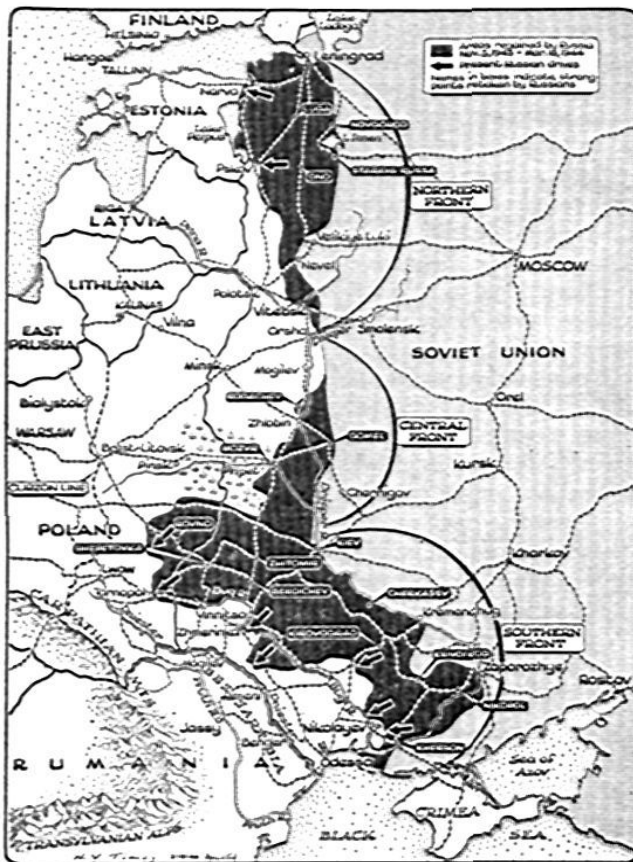
Without serious fighting the retreat ended when the Germans on 29 Feb reached the line

**Pskov — Ostrov — Velikaya River—Opochka—Chernaya Lusha—Vitebsk.**

On 22 Feb a strong Russian attack west of Polya forced a crossing of the Narooova River and established a bridgehead which by the end of the month had a width of 22 miles and a maximum depth of 9 miles. German counterattacks to reduce this salient within their lines commenced on 1 Mar. By the end of the period the bridgehead was reported as having been reduced in area but not as eliminated. This fighting is an indication that the Germans do not intend to withdraw from the line they now hold.

The new line, from the Gulf of Finland to Vitebsk (less the water surface of Lake Peipus), is under 250 miles of land front. This compares with a land front, excluding the water surface of Lake Ilmen, of about 380 miles in mid-January. A reduction of the German front of 130 miles has resulted. In view of this six German divisions are reported as having been withdrawn from this sector. Of these one is reported as having arrived in Holland; the other five have not been located but are presumed to be in GHQ Reserve. This fact is in line with the hypothesis that the German retreat was planned in order to find divisions to reinforce armies in west Europe.

In partial replacement for these withdrawn German troops, reinforcements have arrived on this front. Norway reports that between 6,000 and 9,000 men, trained at instruction centers in that country, left during Feb direct for Riga as replacements. Citations in German General Orders pertaining to this sector of the Russian front mention Estonia and Latvia organizations. Nothing larger than a brigade has been noted. Their organization numbers extend to the 20th Brigade for the two Baltic States. There is no information that there is a complete set of lower numbers, although the population of the small Baltic States would make this possible. It seems likely that these new organizations, whose recruitment was started in March, 1943, do not yet form divisions. They may have been incorporated, at least partially, within German divisions. These new forces probably amount to more than the 6 reportedly withdrawn German divisions. With a front reduced in length by nearly 25% the new line is in a position to offer a strong defense.



### Vitebsk

This is a German strong point. It has been under more or less constant attack since last October. During the period of this account the attacks have been resumed, noticeably on the northeast and southeast sectors. In one of these attacks on 2 Mar made in both these fronts, 17 Russian tanks were reported to have broken through the German lines and reached Vitebsk. This had happened before. All the tanks were destroyed by hunting parties of SP guns and AT groups held in rear areas for such a possibility, the Germans claimed.

A Russian attack on the southeast on 5 Mar made a penetration which the Germans claim to have eliminated 3 days later.

The German defense of this strong point has been exceedingly active. The fortifications are strong. In rear areas, counterattack troops seem to be constantly ready. Defenses to canalize penetrating forces are facilitated by the terrain of this area which the unfordable Dvina River cuts in two. Hills and forests and swamps have been fortified, and afford separate centers of resistance.

### Rogachev Campaign

The sector around Rogachev had been dormant since last November. On 21 Feb, the Russian 1st White Russia Army Group (Gen. Konstantin K. Rokossovsky) attacked to the northeast of Rogachev on a front of 31 miles. In this area the German line was slightly east of the Dnepr River. A powerful artillery preparation was accompanied by intensive air preparation, directed against the lines east of the Dnepr. These were then overrun by Russian tanks and infantry. Shifting the artillery and air preparations to the west bank, the Russians were able to force a crossing at some places.

On 22 Feb the Russians pushed forward. At the same time a secondary attack was launched south of the Berezina River, headed northward to in rear of Zhlobin. This attempt, which was renewed on succeeding days, appear to have been stopped on the Berezina. The main attack made progress. Russians infiltrated through forests and swamps to the Drut River, which was crossed by the leading elements.

On 23 Feb the Russians across the Drut, in numerous small detachments moved southward, and approached the rear of Rogachev. Under this threat the Germans evacuated Rogachev during the night 23/24 Feb. Next day the Russians cleared the east bank of the Dnepr opposite Zhlobin.

Since then until the end of the period there have been numerous Russian renewals of their attack in this sector. None have made appreciable advances.

### Miscellaneous Campaigns

Between 5 and 12 Mar strong Russian attacks were made against Orsha. On 25 Feb and again on 8 Mar other strong attacks were made against Mogilev. None of these had any success. They appear to have been intended primarily as holding attacks, to prevent the withdrawal of German forces.

At the period's end the line north of the Pinsk Marshes was Narova River (with Russian bridgehead on west bank south of Narva)—Lake Peipus—Velikaya River (with German bridgeheads at Pskov, Ostrov, and Opochka)—Idritsa (G)—Chernaya Lusha (G)—Vitebsk (G)—Krasnoe (R)—Gorki (?)—Chausy (G)—Dovsk (R)—Rogachev (R)—Zhlobin (G)—Kalinkovichi (R)—Pripet River—Horyn River.

### South Sector

At the commencement of the period the line was

Horyn River—Gorodetz (?)—Kolki (R)—Styr River (with Russian bridgeheads at Roschiche and Luck, and German bridgehead at Dubno)—Ostrog (R)—Izyaslav (G)—Shepetovka (R)—Polonnoe (R)—Ulanov (R)—Kalinovka (G)—Priluki (G)—Lipovets (G)—Kristinovka (G)—Zvenigorodka (?)—Zlatopol (G)—Kirovograd (R)—Sparsovo (R)—Krivoi Rog (G)—Apostolovo (R)—Girly (R)—Dnepr River.

At the beginning of the period the Korsun campaign had just ended, and the Russians were engaged against what had been the relief force. This operation came to an end on 21 Feb, on a line 33 miles long from east of Zhaskov to south of Zvenigorodka. According to the Russian accounts they had a complete success, completely overwhelming the Germans with enormous losses to the Germans.

According to German accounts, the fighting did not stop on the 21st but continued on in this sector to include 25 Feb, with the Germans on the offensive. This offensive is described as of the same type as previous German ones and was appropriate to their strategical plan. Strong artillery and air preparations cleared areas into which armored forces then advanced with considerable caution. They occupied cleared-out areas and reconnoitered positions still held by the enemy. In accordance with radio reports new artillery and air preparations followed, and were in turn succeeded by a new cautious advance. The object of this slow movement was to inflict proportionately greater losses on the enemy than was sustained by own forces. There are no reliable reports as to the success or failure of this battle.

On 22 Feb both Russians and Germans attacked at Krivoi Rog. In each case the main effort was on the right. Both sides penetrated the front lines of the other. The Russians attacked northeast from Krivoi Rog, forced a crossing of the Saksagan River, and then with armored forces rapidly moved south and into Krivoi Rog. After severe fighting the Germans, not without loss, evacuated the town during the night 22/23 Feb. The German attack which broke through raided

generally in enemy rear areas, and after causing as much damage as possible withdrew to its own lines.

On 23 Feb a German local attack recovered Roschische, north of Luck. Through a hole made in the Russian lines German cavalry raided into rear areas, and on 25 Feb returned to their own lines with prisoners and information as to the situation in the Pinsk Marshes.

On 27 Feb the German Air Force discovered large Russian forces of all arms crossing the Dnepr River over new bridges in the vicinity of Kremenchug, and moving westwardly. It was therefore presumed that a major offensive was in preparation. A minor German attack north of Isyaslav on 23 Feb obtained prisoners and information as to this sector. Attacks around Krivoi Rog between 1 and 3 Mar, partly in return for similar Russian attacks, developed the situation in this area. The German attacks were continued, all of course on a small scale. Present evidence is that the Germans secured enough information as to the impending Russian attack to orient them on the situation. It is not known whether the Germans discovered the date proposed for the new enemy offensive.

#### *Ukraine Campaign*

This has been one of the most ambitious Russian projects. According to Russian dispatches Premier Stalin (in his capacity of Field Marshal) personally supervised the preparation of the plans and himself determined many of the details.

Advantage was taken of the fact that the Russians held the Pinsk Marshes, with a strip solidly held on the south side. Into this strip had been assembled previously all available labor troops. These were restoring roads and bridges, building new bridges across the Dnepr River, and reestablishing railroad communications with the Russian wide gauge.

This preliminary work having been accomplished, three Russian Army Groups (the 1st, 2nd and 3d) apparently were to attack as follows:

**1st Ukraine Army Group to attack southwest from the vicinity of Ostrog to the vicinity of Zvenigorodka, toward the Dnepr River, from Lwow to left army group boundary.**

**Boundary between 1st and 2nd Ukraine Army Group: Zvenigorodka (to 1st)—Kristinovka (to 2nd)—Gaisin (?)—Tilchin (to 2nd)—Mogilev Podolski (to 2nd).**

**2nd Ukraine Army Group to attack southwest to the Dnepr River. Boundary between 2nd and 3rd Ukraine Army Groups: Bobrinets (to 2nd)—Voznesensk (to 3rd)—Dubossary (?).**

**3d Ukraine Army Group to attack southwest and west, clearing out the Black Sea coast as far as the Dnepr River.**

No encirclement of large enemy forces was intended. Previous experience indicated that this was slow and uncertain. In lieu thereof the hammer-and-sickle attack was ordered.

The hammer-and-sickle offensive was to hold the enemy by a frontal attack. This did not necessarily require infantry or armor. It might be limited to a severe pounding by the artillery and/or the air forces. It was essential that the enemy be pinned down. Under cover of this frontal effort light troops (including armor and SP artillery) would turn the enemy's flanks by a wide movement and attack from the rear, without waste of time to determine which was the very best route. This might allow the enemy to withdraw, but even if this happened it quickly permitted a rapid advance.

It was further directed that the enemy be worn down by constant activity, forcing him to abandon or expend supplies and ammunition and above all, men, which it would be difficult to replace. This was a continuation of the attrition idea.

At the time the offensive started it had been freezing in the Ukraine since 24 Feb. It was expected that it would be practicable

to maneuver motor vehicles across country. Much of the intended theater of operations is densely peopled, with numerous villages which run into one another. Intense cultivation includes many orchards, the soil being the richest in Russia. The people were on the land. The entire area is flat.

The 1st Ukraine Army Group started the offensive on 4 Mar. The former commander of this Army Group (Gen. Nikolai F. Vatutin) had been replaced by Gen. Georgi K. Zhukov, recently on General Staff duty. The attack was preceded by a powerful artillery preparation over a 225 mile front from Ostrog (exclusive) to Zvenigorodka (inclusive).

The right of the attack made gains from the first day on a front of 70 to 75 miles, but the remainder of the front accomplished only minor advances. It is probable that the Russians intended it to be so. Strong forces of Russian armor broke through at several places, while others failed to get forward. Those that did get through went straight onward. Infantry following through the gaps turned right and left and opened passages.

Continuing on on the 5th, the advance elements of Russian armor arrived at Volochisk on the main double track railroad from Lwow to Odessa, having made an advance of 50 miles in two days. Russian reports state that for 112 miles on the west sector of this offensive, the opposing German forces consisted of 8 infantry and 4 panzer divisions, which averages but 1 division to a front of over 9 miles. Until the end of the period, serious fighting continued in this area, during which the Russians expanded their gains to the right and left; further advances toward the south or southwest were limited, however. This may have been due in part to a thaw which set in on 6 Mar. This turned the unmetalled roads into deep mud. Supply difficulties were thereby greatly increased.

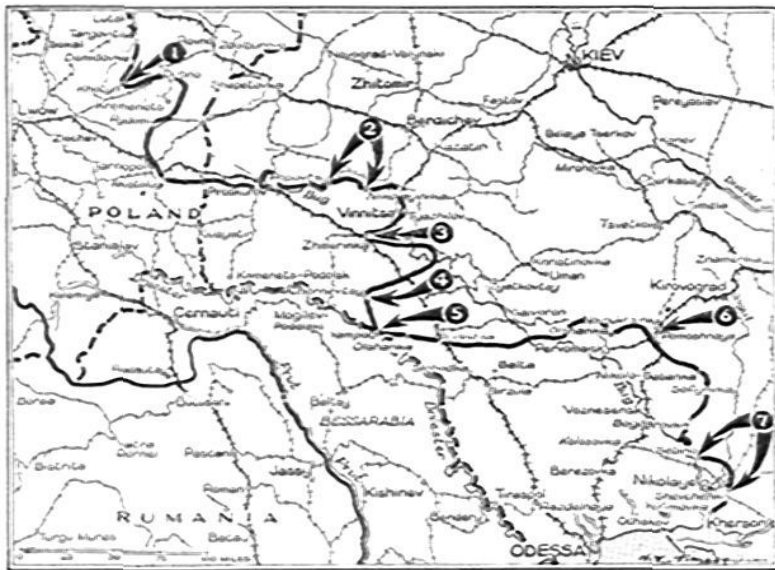
The first German counterattacks are reported for the 6th. They were made by fresh troops who had not been in the front line. These seem to have been taken from the German 2nd line, in rear of the Lwow & Odessa RR, beyond which the Russians were unable to penetrate far.

The 2nd and 3d Ukraine Army Groups (Marshal Ivan S. Konev and Gen. Rodion N. Malinovski, respectively) started their parts in the general offensive on 6 Mar. Both made their main efforts on their right. For some reason not yet known, Russian GHQ sent Marshal Vassilevsky to the 3d Ukraine Army Group with authority to issue orders in their name, which he seems to have done rather frequently, so that he became the real commander. Such an arrangement did not occur at the other two Army Groups.

The advances secured on the 6th following the usual very strong artillery preparations, were not very great. The 2nd Ukraine had its tanks and infantry following closely in rear of the artillery barrage, and broke into the German lines. They secured several wedges. No report has been found as to the success of the 3d Ukraine. On this day the 1st Ukraine got infantry near Volochisk, which point was retaken.

On 7 Mar the 1st Ukraine continued to exploit its gains. It came into violent contact with the troops from the German 2nd line. These counterattacked in numerous directions. In general, half of a panzer division (with about 50 tanks in line) led. They were followed by a variable number of infantry battalions in armored trucks, largely of caterpillar type. These mobile units, well provided with SP batteries, wandered around the forward area attacking hard anything they could find. They were oriented by air reconnaissance as to the position of the enemy and of supporting troops. Russian reports comment on the quick German recovery, following their bad





*Driving toward Lwow, Soviet forces advanced fifteen miles to take Khotyn (1). Northwest of Vinnitsa they crossed the Bug on a wide front between Popovtsy and Nikolayevka (2). The Red Army captured the railway junction of Zhmerinka (3). It neared Mogilev—Podolski by winning Chernevtsy (4). The Bessarabian border was reached with the capture of Yampol (5) on the Dniester. The fall of Pomoshnaya (6) cost the Germans control of the terminus of their last east-west railway in the Ukraine. The Russians closing in on Nikolaev took Sebino and Shevchenko (7). They also announced the virtual destruction of the Sixth German Army northeast of the port.*

defeat of 4 Mar when their line was broken through.

Present information indicates that the Germans, aware of the impending attack, had chosen a main line of resistance 50 miles in rear of the front. Their advance divisions fell back to in rear of the position. The Russians claim extraordinarily high losses for the Germans, but include only 3,000 prisoners for the breakthrough days of 4 and 5 Mar. This is an average of 250 per division, and presumably includes abandoned men and stragglers. Notwithstanding the opposition encountered the Russians established themselves as far as 5 miles south of Volochisk, and their exploitation troops approached Tarnopol. They also extended their main effort eastward by a strong coordinated attack against the line Proskurov—Zhmerinka. The 2nd and 3d Ukraine made their main efforts west of Kirovograd and west of Krivoi Rog, respectively. Both made advances, the depth of which was not reported by either side.

On 8 Mar the 1st Ukraine continued, with its main effort against the town of Starokonstantinov. For this objective the hammer-and-sickle attack was selected. The frontal attack was limited mostly to very strong shelling by the artillery. Mobile forces were sent east and west. They crossed the Slutch River, and closed in on their objective. A similar attack was directed against Proskurov. The mobile column on the east crossed the Bug River, about 16 miles away, but no such success was had on the west side. The 2nd and 3d Ukraine Army Groups attacked respectively between Zlatopol and Kirovograd, and on both sides of Krivoi Rog. Strenuous resistance was met but advances were made, particularly south of Krivoi Rog.

On 9 Mar the 1st Ukraine Army Group broke into Tarnopol. The local garrison made a strong fight; street battles resulted. No great progress was made around Proskurov. The right of the 2nd

Ukraine Army Group pushed ahead. The left of the 1st Ukraine was nearly parallel to the direction of German advance, which facilitated overcoming German resistance in this sector. In view of this situation the Germans withdrew considerably in this sector by falling back in rear of Uman, all the way to the Bug River.

The 3d Ukraine attacked south of Krivoi Rog on a narrow front, across country where there were no roads and the ground was deep in mud. Finding a weak spot, they pushed ahead and on a front of about 35 miles reached the line Kasanka—Novyi Bug. This made a maximum advance for this army of 20 miles since the offensive started four days earlier.

In spite of numerous efforts the 1st Ukraine was unable to advance on the 10th. Stiff fighting occurred at Tarnopol, Proskurov, and other places, along a front extending 110 miles eastward from Tarnopol. The 2nd Ukraine reached the line Kristinovka—Uman, having made a 30-mile advance from the Korny Tikich River against 6 panzer divisions on a front exceeding 30 miles. German reports are that this area had been evacuated on the day before. The right of the 3d Ukraine also advanced.

The forward movement of the 2nd Ukraine Army Group freed the left of the 1st Ukraine's forces. Those troops thereby became available for other missions.

On 11 Mar the 1st Ukraine started a strong attack against Vinnitsa, while maintaining its efforts against

Tarnopol and Proskurov. The Germans counterattacked Tarnopol with a view to driving the Russians out of that part of the city which they had entered. Advance elements of the 2nd Ukraine reached the Bug River and discovered the German retreat. They were too weak to cross that river, however. The left of this army started forward and reached the line Zlatopol—Novo Misorod.

The 3d Ukraine extended their offensive by new movements on both flanks. On the right an advance was made to Dolinovka. On the left, Russian troops which had descended the Dnepr River turned inland from Berislav in a west-northwest direction, toward the Ingulets River.

On the 12th there was no substantial change on the front of the 1st Ukraine. The Germans held against numerous strong attacks. The 2nd Ukraine was advancing to the Bug River. Instead of rear guards, the Germans when they retired to the Bug left behind them an unstated number of combat groups consisting mostly of armored troops well supplied with self-propelled artillery. These combat troops were charged with delaying the enemy by making attacks from unexpected directions. They were supported by the air force. These groups forced the pursuit to stop, organize an attack, and start an artillery preparation. Then they would rapidly withdraw, not necessarily straight to the rear, and later attack elsewhere. The essence of the combat group retreat is to strike hard and often, but not to press attacks. A timely withdrawal, to live and fight in another place, is required. The Germans withdrew their combat groups this day to across the Bug, and the Russians arrived at Gaivoron with the right of the 2nd Ukraine while the left was far behind near Novo Archangelsk.

The right of the 3d Ukraine advanced from Dolinovka (Dolinsk or Dolinskaya on some maps) and reached the Ingul (not Ingulets) River, giving the Russians a line along this river from Krivoi Rog southward to below Novyi Bug. The left of this Army Group moved toward Kherson. During

the ensuing night the Germans evacuated that city, abandoning the lower Dnepr and withdrawing to a large bridgehead around Nikolaev. Troops from the Kherson area had no trouble reaching their destination, but other Germans to the north were uncovered by a rather hasty withdrawal to their south. These troops, estimated at three divisions, were still on the Inguletz (not Ingul) River north of Berislav, covering a front of about 45 miles.

The thaw was continuing throughout the Ukraine. All roads were quagmires and unusable, vehicles detouring through the fields. The Russians used many animal-drawn sleds to reach forward areas. Operations were retarded everywhere.

On 13 Mar the left of the 1st Ukraine, as a result of the advance of the right of the 2nd Ukraine, reached Lipovets. On the right a strong German counterattack drove back the Russian mobile forces endeavoring to use the hammer-and-sickle method east of Tarnopol, trying to get in by the back door. Progress was made in clearing Tarnopol itself but the Russians resisted strenuously.

The right of the 2nd Ukraine closed in to the Bug River line already reached but the left was still far behind, leaving the right as a huge salient. The Russians report the capture of 150 guns, all belonging to the German 18th Artillery Division, which were taken near Vyssa.

The 3d Ukraine started a maneuver to encircle the 3 German divisions north of Berislav. The right formed a new front facing south, reached a line Poltava (exc) —Vladimirovka (inc) —Orlov (inc), and attacked. The Russians from Kherson, despite deep mud and absence of roads, moved north from the Kherson area and reached the district around Bereznegovatoie. This march appears to have been unopposed. In its new location this force was squarely across the expected line of withdrawal of the 3 German infantry divisions.

These 3 divisions attacked this Russian force on the 14th with a part of their forces, while the main body moved south to the vicinity of Tarassovka, on the lower Inguletz. Then during the night of 14/15 Mar the 3 German divisions sought to cross the Inguletz at as many points. Russian and German accounts of the ensuing battle can not be made to agree.

According to Russian accounts, all crossing attempts were stopped during the night by artillery fire. At the same time, Russian troops which had followed the Germans down the left bank of the Inguletz attacked with tanks from the north and broke the entire German force into separated parts during an all-day fight during 15 Mar. The Germans are alleged to have collapsed and to have died by the hundreds, partly from the fire of the tanks and partly by being crushed under their treads. The Russians admit that remnants (including part of the division staffs) escaped. On the 16th the remainder of the Germans were "liquidated" with a loss stated to be 13,859 prisoners and 36,800 killed in all.

According to German accounts only one German division, the 335th Infantry Division, was involved in encirclement around Tarassovka. This fought its way out during the night of 16/17 Mar and rejoined its main body. It is alleged that it brought out all the wounded, together with many prisoners. By inference the other two German divisions got out the night of 14/15 Mar, only the northern one of the three divisions being interfered with by the Russian

attack coming from that direction. Further reports are needed to determine just what did happen.

Meantime there had been an important change in the line during the 14th. The 2nd Ukraine forced a crossing of the Bug River on both sides of Gaissin. There was not much opposition, the Germans having fallen back to the Dnepr River, about 60 miles away. Under these circumstances the 2nd Ukraine, retarded only demolitions, road mines, and enemy combat groups, advanced a full 10 miles beyond the Bug. On the 15th the Russians extended the crossing to both sides of Gaivoron, also without much resistance being met with. The center of this Army Group reached the Bug at Golovanesk. The left was still well to the rear.

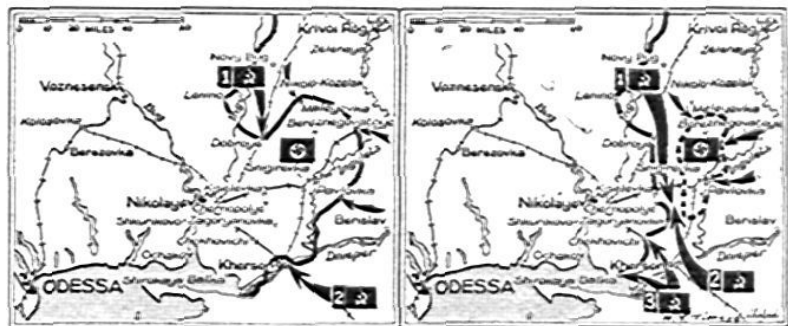
There had been no material change during the past few days on the front of the 1st Ukraine, except that the Germans had reoccupied all of Tarnopol. Using the troops presumably taken from the former left, and made possible by the advance of the 2nd Ukraine, the 1st started a new offensive on 16 Mar. This was a 100-mile front extending from opposite Kovel (German), Luck, (Russian) Dubno (German) to opposite Krzemieniec (Kremenets on some maps). At the same time renewed strong attacks were made on the 150-mile front from Tarnopol eastward past Proskurov to Vinnitsa.

The left of the 2nd Ukraine advanced to the line Rovnoie—Bobrinets, while the 3d Ukraine closed in on the Nikolaev bridgehead.

On 17 Mar the Russians captured the German bridgehead at Dubno and advanced some distance beyond. The attack near Proskurov met a German panzer counterattack, resulting in both sides making gains and having losses with no material change in the general situation.

The right of the 2nd Ukraine Army Group pushed forward on the west side of the Dnepr River and reached points 35 miles from that river. The left of this army group was at Novo Ukrainka. The 3d Ukraine closed in on the bridgehead.

On 18 Mar the 1st Ukraine Army Group with its extreme right was close to Kovel. Strong attacks were being delivered against Krzemieniec (Kremenets), which was a strong German center of resistance. The left of this Group, not being able to get into Vinnitsa by the hammer-and-sickle method, swung



*This is how the scene was set for the entrapment of large German forces east of Nikolaev. To the north a Soviet column was poised near Dobroye (1). To the south other Soviet troops, some of which had captured Kherson, joined with units that had slanted down the Dnieper River and prepared to strike northward (2). Other Russian contingents pressed in from the east.*

*The northern column (1) smashed twenty-two miles in a southerly direction, cut the Nikolaev—Snigirevka railroad and took Kiselevka. The southern column (2) advanced northward and made the junction that ringed the enemy. Moscow reported that 10,000 Germans had been slain and 4,000 taken prisoner in the trap thus jar. Fanning out from Kherson (3), the Russians took Shirokaya Balke and Chekhovichi.*

the east arm of the encircling movement far out to the south. It secured Zhmerinka.

The 2nd Ukraine Army Group, meeting no great resistance, arrived with its right at Yampol on the Dnestr River while the left, still far in rear, was at Pestchany Brod, northeast of Pervomaisk (Olviopol on some maps).

The 3d Ukraine Army Group pushed across the Ingul River north of Nikolaev and reached the Yelmetz River.

As this account closes the line for the south sector was

*Stalin (?) on Horyn River*—Karassin (R)—Gulevichi (R)—Dubno (R)—Krzemieniec (G)—Zbaraz (R)—Tarnopol (G)—Skalat (R)—Proskurov (G)—Bug River (with German bridgehead at Vinnitsa) as far as Zhmerinka (R)—Rachny (G)—Yampol (R)—Pescanka (R)—Savran (G)—Golovanesk (R)—Dobrianka (R)—Pestchany Brod (R)—Brotsk (G)—Yelanets (R)—Nova Odessa (R)—Nikolaev with bridgehead across the Bug (G).

At this date the Germans were withdrawing from the loop between Proskurov—Khmelnick—Vinnitsa and Zhmerinka, and from the area beyond the Bug between Pervomaisk and Voznesensk.

#### *The Crimea*

There have been no important operations in this area. Minor Russian attacks from the bridgehead northeast of Kerch failed to gain and were not pushed. It is now known that the Germans have a bridgehead just west of the Siwash, which is a shallow salt bay covering the railroad into the Crimea. A minor Russian attack here failed also. The other contact between the defenders of the Crimea and the Russians is at the strongly fortified Perekop Isthmus. Nothing is reported from this area.

#### COMMENTS

1. *The German Strategic Plan.* There are indications that Germany is concentrating her maximum energies against threatened action in west Europe. For this purpose the Russian front has been withdrawn, and in part shortened, to free troops to be sent westward.

According to Swedish reports last autumn 15 German divisions were employed in maintaining order in occupied rear areas in Russia, in addition to large forces of military police. The German retreat will make these rear troops largely available for line duty.

The German front in Russia has already been reinforced by some Baltic troops. Recent events indicate that the Hungarians and Romanians will be expected to furnish additional troops to defend their own countries. The final line of defense will probably be the Carpathian Mountains for Hungary, and the Sereth and Danube Rivers for Romania.

2. *The German Withdrawal in Russia.* Russian accounts state daily the losses alleged to have been incurred by the Germans. As to materiel, the figures appear to be exact; as to personnel, in round numbers. The latter figures are huge. As the Russians do not give their own losses, the accumulation of these reports over a campaign which has lasted continuously over eight months has given an impression that the Germans have suffered so severely that they will be unable to recover.

There is doubt as to this. As indicated above, there is evidence that the German withdrawal is, in its general lines, according to a plan to obtain troops for use in west Europe. Taking into consideration the fact that German captured and destroyed materiel must be scattered over a vast area, it is not clear how reports so accurate as to numbers are obtained within a minimum of time.

Sometimes the German plan has gone wrong. The loss of troops in early February near Korsun was undoubtedly serious. Also the loss in March on the lower Bug of 3 German divisions, or part of them, was not according to any German plan.

But the withdrawal as a whole appears to have been conducted with considerable success, and certainly without disaster.

3. *The German line in White Russia,* since last November, has remained substantially unchanged along the line of the Dnepr River. The position of this line, and the lines of communication in rear of it, make it a favorable area for a comeback campaign if troops ever become available. This might be either toward Moscow or toward Orel. If the mass of the Russian troops are at that time tied down to a campaign south of the Pinsk Marshes against the Carpathian Line, there would be a chance of a German victory.

German strategy in Russia appears to be based upon a temporary

strategic defense, pending a determination of the west Europe situation. If this succeeds, the withdrawal will have made available a maximum number of German divisions in west Europe. If the situation there clears from a German standpoint, the Russian front is so shaped as to admit of a return to the strategic offensive—and more quickly than Russia could probably move troops back from its south front.

4. *Modern Tactics.* Recent Russian campaigns have been fought in a very flat country. Motorized units, if not prevented by weather conditions, can maneuver over vast areas with considerable choice as to directions. The tactics suitable for this kind of terrain might be highly inappropriate in a different type of country, such as in mountains.

Main lines of resistance in the flat country are now 50 miles back of the outpost line. Outposts are largely composed of armored troops. They are able to get away quickly. Their mission is to break the enemy's advance and canalize it by offering easy routes of approach to the MLR and denying other routes. To accomplish this, the local commanders are given much freedom. They may strike to the right or to the left, advance or retire. In no case must they permit themselves to be encircled and cut off. Rather, they concentrate to encircle and destroy enemy spearheads.

At the proper time the combat groups formed from the former outpost line fall back in rear of the MLR, which thereupon counterattacks against a disordered enemy advance.

The Russian hammer-and-sickle attack is a new name for a double envelopment, in this case using motorized troops. This is an effective method, if it can be carried out. There is no evidence so far that this method has produced great results. It would if the enemy consented to stand still while his envelopment was accomplished. An active and intelligent enemy can avoid this now as well as in past times. It is necessary, however, to keep reconnaissance well out. Both air and ground reconnaissance is needed.

The number of armored and motorized divisions and of troops is constantly increasing. The limit is the ability of the supply departments to provide the required motor equipment and maintain it.

The Russians report the presence of German Artillery Divisions. There is little information as to their composition. German organization would indicate that the Artillery Division consists of an artillery staff, prepared to undertake extensive artillery missions. The number and caliber of batteries would be no fixed number: it would be whatever the situation required.

Artillery divisions replace the artillery reserve of former wars, with the difference that the modern artillery division is highly mobile. Its function is to strengthen active sectors with increased fire support. The Russians have long used them with apparently excellent results.

#### KORSUN CAMPAIGN (PRIOR TO 21 FEB 44)

In the preceding issue of this JOURNAL, the account of this campaign ended with statements of divergent Russian and German reports as to the fate of German troops in this area.

The Russians have since conducted a series of personally conducted tours of correspondents, to where the battles were fought. All correspondents agreed that from what they saw it was plain that no Germans had escaped the Russian trap. It was admitted that 2,500 Germans had escaped by air, the Russians stating these were all officers, leaving practically none with the troops. Of the troops, 11,000 were stated as having been captured and 52,000 as killed.

One correspondent gave a clue. His investigation on the ground led him to believe that the surrounded Germans were the forward combat echelons and did not include the rear echelons, which had never been surrounded. The rear echelons were believed by the Russians to have rejoined their lines. With the 2,500 combat officers who escaped by air, the Germans were thereby able to continue all divisions in line.

The only corroborative German account is that 2,400 were brought out by air. The Germans claim these were all wounded.

The 63,000 men accounted for in Russian reports would be about the strength of forward echelons of 10½ divisions. If rear echelons escaped, service troops probably did too.

Regardless of details, the Russians won a decided victory. Besides the loss of a large number of troops the Germans lost an important salient extending to the Dnepr River, from which they had been threatening Kiev.

# BORESIGHTING

By Maj. Marion H. Schultz, FA, and Capt. Lauren K. Soth, FA

Accurate artillery fire delivered on time—the kind of fire that shatters the living daylights out of the enemy before he can get set—demands sighting equipment that is accurate down to a gnat's eyeball. In field artillery language that means accuracy down to ½ mil.

To be sure your sighting equipment meets that specification you, Lt. Battery Executive, must know how to find errors on all types of sighting equipment and how to correct them. You may be called upon to serve with any of the various howitzers and guns now used by our forces—to say nothing of captured enemy materiel. If you understand the principles of the panoramic telescope and the azimuth-compensating mounts you can quickly test and adjust any sighting equipment in daylight, at night, in the jungle, or in mountains.

Panoramic telescopes used on field artillery weapons all measure horizontal angles clockwise from the vertical plane passing through the axis of the bore. In order to be certain that a telescope is actually measuring horizontal angles from this starting point you must test the telescope and its mount to determine (1) whether the axis of the bore and the axis of the telescope (line of sight) are parallel at zero deflection and (2) whether the telescope shank is truly vertical when the level bubbles are centered.

If the line of sight is not parallel to the vertical plane through the axis of the bore at zero deflection there are 3 possible sources of error: (1) the fastening of the actuating arm of the mount to the cradle or trunnion, (2) the cross level bubble vial, (3) the azimuth scales of the telescope.

## ACTUATING ARM

The axis of the pivot in the left end of the actuating arm of the mount should be parallel to the axis of the bore (Fig. 1). This fixed relationship is what provides the azimuth-compensating action of the mount when the piece is elevated on a cant. The actuating arm is attached to the trunnion or cradle so that any motion in elevation of the tube also turns the T-shaped actuating arm by the same amount, keeping the pivot parallel to the axis of the bore. The cross-leveling worm moves the mount around this pivot (Fig. 2). Thus when the mount is level crosswise, the line of sight at zero deflection is always

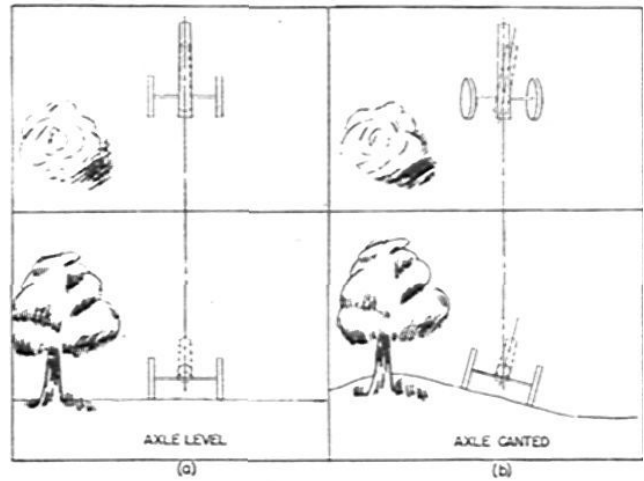


Figure 3. Change in azimuth due to axle cant

parallel to the vertical plane passing through the axis of the bore.

For example, when the piece is elevated on a cant (say to the right), the axis of the bore is pulled off the target to the right (Fig. 3). But since the pivot is twisted in the same amount by being rigidly fixed to the cradle or trunnion, the line of sight is also pulled off the target or aiming point by the same number of mils after cross-leveling. Thus it is necessary to traverse the piece to the left to get the axis of the bore back on the target.

Many field artillerymen still seek level ground for gun positions because they believe their fire will be inaccurate if cant is present. Level ground may be necessary in some cases to avoid excessive digging to give the carriage stability in firing, but it is not necessary to eliminate cant to get accurate fire—providing the sighting equipment is in adjustment. All our telescope mounts are so constructed as to fully compensate for cant. Ordinarily it is not necessary to verify the position of the actuating arm pivot, but some time you may want to know how. Here's how: First, level the tube lengthwise. The actuating arm pivot should then also be level. Boresight on a

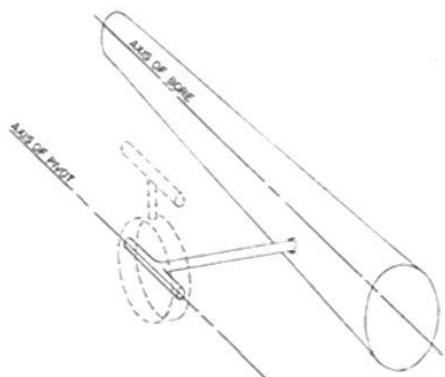


Figure 1. Axis of pivot is parallel to axis of bore

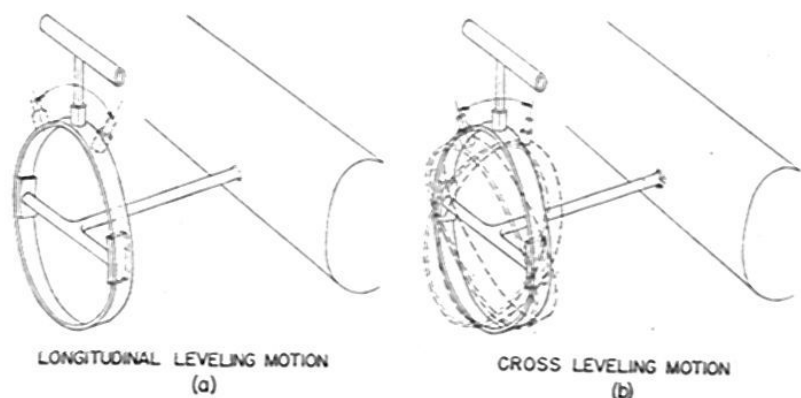


Figure 2. Cross Leveling and longitudinal leveling

distant aiming point or testing target. Center the cross-level bubble and place the intersection of the crosshairs of the telescope on the aiming point or proper portion of the testing target.\* Adjust the azimuth micrometer scale or index so that the scale reads zero when the intersection of the crosshairs is on the aiming point. Level the mount longitudinally and set off exactly 1600 mils on the telescope. Hang a plumb line so that the intersection of the crosshairs appears on the line. Then rotate the mount crosswise by using the cross-leveling knob. If the pivot of the actuating arm is level and parallel to the axis of the bore, the intersection of the crosshairs will stay on the line throughout the rotation of the mount.

A rough test of the actuating arm pivot is the "wobble test." Boresight on a distant aiming point as before. Rotate the mount crosswise throughout its range by using the cross-leveling knob. The arc described by the intersection of the crosshairs should appear to be tangent to the aiming point. If it appears to be above or below the aiming point, the pivot probably is out of adjustment.

#### LEVEL BUBBLES

The level bubbles on most modern field artillery materiel can be checked by a gunner's quadrant on a flat piece of glass or steel on the telescope socket. On other materiel (such as the 155-mm Howitzer M1918 or the 75-mm howitzers), these bubbles may be checked as follows.

To test the cross-level bubble, hang a plumb line in line with the intersection of the telescope crosshairs at zero deflection, with the cross-level bubble centered. Rotate the elevation knob of the telescope, tipping the line of sight up and down along the plumb line. The intersection of the crosshairs should stay on line. If it does not, the bubble vial is out of adjustment. Determine the true cross-level position by turning the cross-leveling knob small amounts until the cross-hairs will stay on the plumb line.

The longitudinal level bubble is checked the same way by hanging a plumb line in line with the intersection of the crosshairs at 1600 mils deflection.

In the field, the actuating arm pivot and the cross level bubble can be checked at the same time. Level the trunnions. Boresight on a distant aiming point or on a test target with the cross-level bubble centered. Elevate the piece to maximum elevation and bring the line of sight back down on the aiming point by turning the longitudinal-leveling knob. The intersection of the crosshairs should still be on the aiming point or the proper portion of the test target. If not, either the actuating arm pivot is out of adjustment, or the level bubble does not indicate the true cross-level position of the mount.

#### AZIMUTH SCALES

In adjusting the azimuth scales it is usually easier to use a distant aiming point than the testing target, and it is equally accurate. The only requirements in using a distant aiming point are (1) that the aiming point be far enough away so that the maximum error due to displacement of the telescope is not

\*If a testing target is used, the carriage must also be level crosswise. On weapons such as the 155-mm Howitzer M1 which do not have a flat surface parallel to the trunnions which can be used for leveling with a gunner's quadrant, use the following method. Place the boresight in the breech and tie strings across the muzzle, using the witness marks. Hang a plumb line in front of the muzzle in line with the axis of the bore. By raising or lowering one trail, determine the position of the carriage in which the piece can be elevated through its maximum range with the axis of the bore remaining in coincidence with the plumb line.

more than ½ mil and (2) that the mount be leveled crosswise. After cross-leveling the line of sight should be parallel to the axis of the bore at zero deflection, regardless of the elevation of the tube or cant of the trunnions.

#### SOURCE OF ERROR

In boresighting materiel such as the 75-mm pack howitzer, it is frequently difficult to determine the source of the error. The actuating arm pivot is least likely to be in error, since it should be properly affixed in manufacture and is not likely to get out of adjustment unless the carriage is overturned or the mount bent by a heavy blow. The level bubbles are also relatively unsusceptible to maladjustment if the sighting equipment is not banged around and is protected against bumps and shocks.

So always suspect the azimuth scales first. Check the alinement of the telescope and the axis of the bore first and make correction in the azimuth micrometer if necessary.

Then test the alinement of the actuating arm pivot as described above. The pivot may be out of line with the bore horizontally (pointing up or down more than the bore) or vertically (pointing in toward the tube or away from it). If the pivot is out of alinement vertically, it is possible in the case of the 75-mm howitzers and the 105-mm howitzer M3 to adjust it by trial-and-error.

If the intersection of the telescope crosshairs will not follow the plumb line at 1600 mils when the cross-leveling knob is rotated, try to find another deflection setting at which the intersection will stay on line. This may be done by turning the azimuth micrometer and either traversing the piece (providing the tube is kept level longitudinally) or changing the position of the plumb line. If the intersection of the crosshairs will stay on line at some other deflection than exactly 1600 mils, the actuating arm pivot is not parallel with the axis of the bore vertically.

To correct this error, adjust the azimuth micrometer until the intersection of the crosshairs will stay on line at exactly 1600 mils. Then return to zero deflection and place the intersection of the crosshairs on the distant aiming point or testing target by turning the adjusting screw in the socket of the cradle.

If the pivot is out of alinement horizontally, the adjustment must be made by Ordnance.

#### NIGHT BORESIGHTING

Most artillery positions are occupied at night—which means that, along with your other difficulties, you must test and adjust sighting equipment in the dark. It isn't nearly so hard as it sounds. Often you can boresight on a distant aiming point that looms up in the moonlight. Sometimes you can use a star. Remember, when using a distant aiming point, neither the tube nor the trunnions need be level to check the azimuth scales of the telescope.

But sometimes you can't see a distant aiming point, and most of the time you can't pick out a single star to use. You're not licked yet, though, because you can use the aiming post method or the aiming circle method on the banks of the River Styx itself.

#### *Using an Aiming Post*

The aiming post method is the same as the distant aiming point method, except that the aiming point is only a short distance in front of the piece. When the aiming point is 1,000 or more yards away, the displacement of the telescope from the bore can be ignored. When the aiming point is close you must compute the angle to be set on the telescope in order that

the lines of sight through the telescope and through the bore will intersect at the aiming point.

Since you can't always use the same distance for the aiming post, because of differences in terrain, it's best to work out the proper distances for several deflection settings and stick the chart on the gun shield or keep it in your notebook. The angle set on the telescope is the same as the angle formed at the aiming point by the lines of sight through the axis of the bore and through the telescope. For example, the horizontal displacement of the telescope for the 105-mm Howitzer M2 is 15.23". Thus at 1,939" (162') the correct angle to be set on the telescope is  $(15.23 \div 1,939 = .00785)$ , which is the tangent of 8 mils. Here is a sample table showing the angles for the 105-mm Howitzer M2; these figures were computed using the trigonometric function.

Telescope Setting (mils)	Aiming Post Distance (feet)
8	162
9	144
10	129
11	118
12	108
13	99
14	92
15	86
16	81
17	76
18	72
19	68
20	65

Equipped with your table of telescope settings and distances, you're ready to boresight. Level the tube and the trunnions. Place two M14 aiming post lights on an aiming post exactly the same distance apart as the vertical displacement of the telescope from the bore (12.15" for the 105 M2 with M12A2 telescope). Stick the aiming post in the ground at a distance (selected from the table) which best suits the position. Adjust the aiming post and lights until the lower light is in line with the axis of the bore. Be sure the aiming post is vertical.

Cross-level the telescope mount, set the elevation indexes of the telescope at zero, and turn the azimuth micrometer until the vertical crosshair is on the upper light. If the horizontal crosshair is not on the light the elevation indexes of the telescope are out of adjustment and must be corrected. If the azimuth micrometer setting is not the same as shown in the table for the distance used, it is out of adjustment and must be corrected to the proper reading.

As the aiming post lights will appear as pin points at 50 to 200 feet, the adjustments can be made accurately.

This method of boresighting can also be used during the daytime. Construct two metal discs, one 8" and the other 4" in diameter, each with a clamp similar to that on the aiming post lights. Paint the face of each disc to correspond to the testing target butterfly. Substitute the 8" disc for the lower light and the 4" disc for the top light.

#### Using Aiming Circle

Many executives use the aiming circle method of boresighting—particularly on heavy weapons. The procedure is simple. Set up the aiming circle at least 30 yards directly in rear of the piece to minimize error from not sighting exactly in the center of the telescope shank or aiming circle. Be sure to

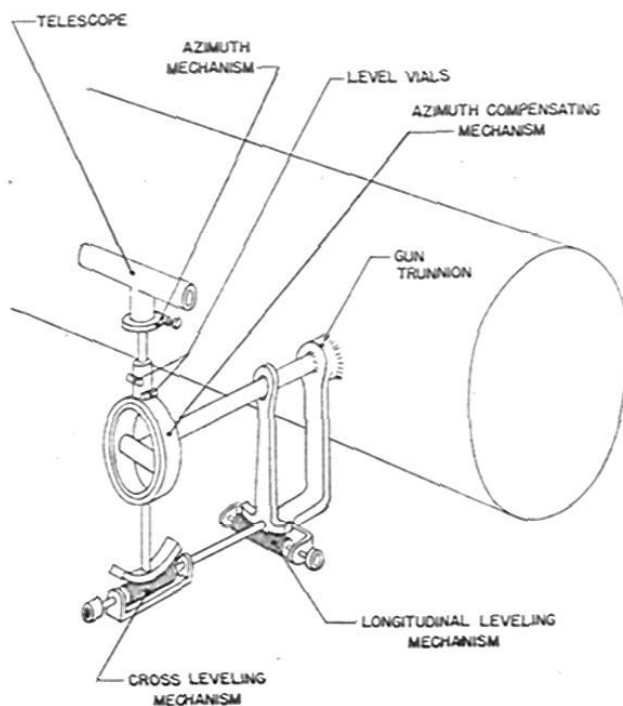


Figure 4. Schematic diagram of telescope mount

have the aiming circle and panoramic telescope exactly level. Place the 0-3200 line of the aiming circle in line with the axis of the bore by using the lower motion. The center of the bore can be marked by having a man hold a straight stick over the vertical witness marks on the muzzle and protruding above the tube and recuperator cylinder so that the aiming circle operator can see it. The firing pin hole can be used to mark the center of the powder chamber. The stick on the muzzle and the firing pin hole provide a line on which the 0-3200 line of the aiming circle can be laid.

Using the upper motion of the aiming circle, refer to the center of the panoramic telescope shank. Announce the reading to the operator of the telescope. The operator of the telescope then refers his line of sight to the center of the aiming circle by turning the azimuth micrometer. The readings on the telescope and on the aiming circle should be identical down to the half mil. If they are not, adjust the azimuth micrometer of the telescope to correspond to the aiming circle reading when the intersection of the crosshairs is on the center of the aiming circle.

At night the stick, the firing pin hole, the telescope, and the aiming circle can be marked with small lights.

The tube can be elevated to facilitate laying the 0-3200 line of aiming circle on the axis of the bore. Cant of the trunnions or elevation of the tube make no difference so long as the telescope mount is level.

These examples do not exhaust the possibilities in boresighting by any means. An ingenious battery executive who understands sights and mounts can develop several alternative ways of making the alignment tests, and train his chiefs of section and gunners so they can always assure themselves that their sights are correct. Then when he gives the command *Fire*, he knows his guns are pointed in the direction they should be.



# 12-Inch Graphical Firing Table

By Lt. Col. Abbott H. Burns, FA

Ever since the first GFT was built there has been a growing demand for a more convenient and compact model. A 12-inch GFT has now been developed to fill the need for a small, simple, and convenient firing table for the use of observers and battery command post personnel. It has passed all tests of use. It also makes a splendid GFT for the use of airborne and pack artillery and for units on operations in which space and weight are vital.

This 12-inch GFT consists essentially of a slab of wood, on each side of which are printed two charges and the corresponding range scale, and an indicator. *There is no slide.*

The 12-inch GFT functions on the same principles and performs the same operations as the standard 16-inch GFT slide rule. In general, instructional material for the 16-inch GFT applies to the 12-inch GFT. There are certain special instructions, however.

To set up the assembled 12-inch GFT, first move the hairline to the check point range. Then with a pencil draw an elevation gage line on the face of the indicator opposite the adjusted elevation and an adjusted time gage line opposite the adjusted fuze setting.

To use the 12-inch GFT, first move the hairline to the desired range. Then, choosing the most appropriate charge (determined by inspection), read the elevation opposite the elevation gage line and the fuze setting opposite the adjusted time gage line. Read values of *c* and drift opposite the elevation gage lines.

To set up a 12-inch GFT to apply metro-range corrections, compute the metro-range effect for the center (triangular gage point) range from the standard firing table. Apply this range *effect* to the range for which it was computed and set the hairline over the resulting range. Finally, draw an elevation gage line opposite the triangular gage point.

To determine a *K*-change, note the distance between the elevation gage line determined using the metro message and the elevation gage line determined from registration. To apply this *K*-change, displace the elevation gage point for a subsequent metro message by the amount noted above.

The following example illustrates the use of the 12-inch GFT in firing time fire.

*Registration.*—A high burst registration is to be fired at a range of approximately 6,000 yards with charge 6, to determine corrections for unobserved time fire. The base deflection lies down the center of the sector. An initial height of burst (site) of +30 mils is used to insure air bursts. Move the indicator to 6,000 on the range scale, and read the elevation as 280 and the fuze setting as 18.4 (Fig. 1).

Initial commands are:

NO. 3 ADJUST  
SHELL H.E.  
CHARGE 6  
TIME 18.4  
BASE DEFLECTION  
SITE 330  
NO. 1 ONE ROUND  
ELEVATION 280

This first round is fired and the two observing instruments are laid on the burst. The height of burst is 10 mils higher than is required for good sensings. The next command is:

DOWN 10  
NO. 1 SIX ROUNDS  
ELEVATION 280

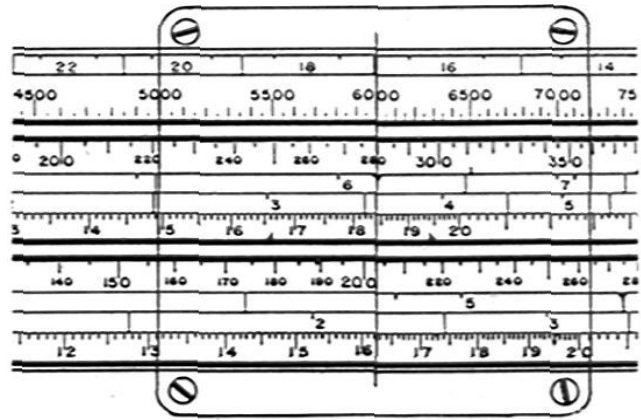


Figure 1

The mean site of these six rounds is +18 mils and the plotted range based on the mean of the observers' sensings is 6,140 yards. Corrections are now set as follows:

Elevation fired	280
Site fired (30-10)	20
	—
Quadrant elevation at which bursts were fired	300
Site	—(+18)
	—
Adjusted elevation	282

Move the hairline to range 6,140, mark an adjusted elevation gage line at 282<sup>m</sup> elevation, and mark an adjusted time gage line at fuze setting 18.4 seconds (see Fig. 2).

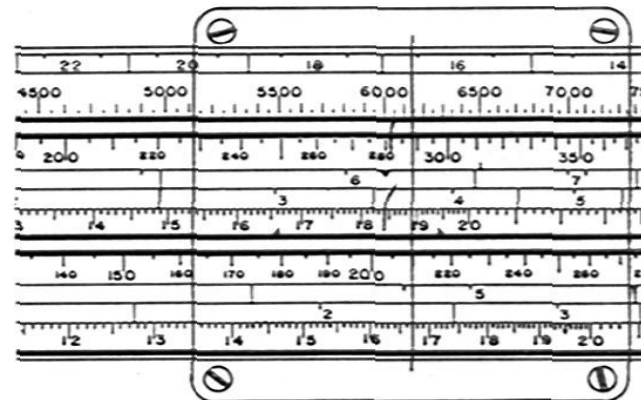


Figure 2

*Firing a concentration.*—A target is to be taken under fire at range 5,430 yards. Site to target is +17 mils.

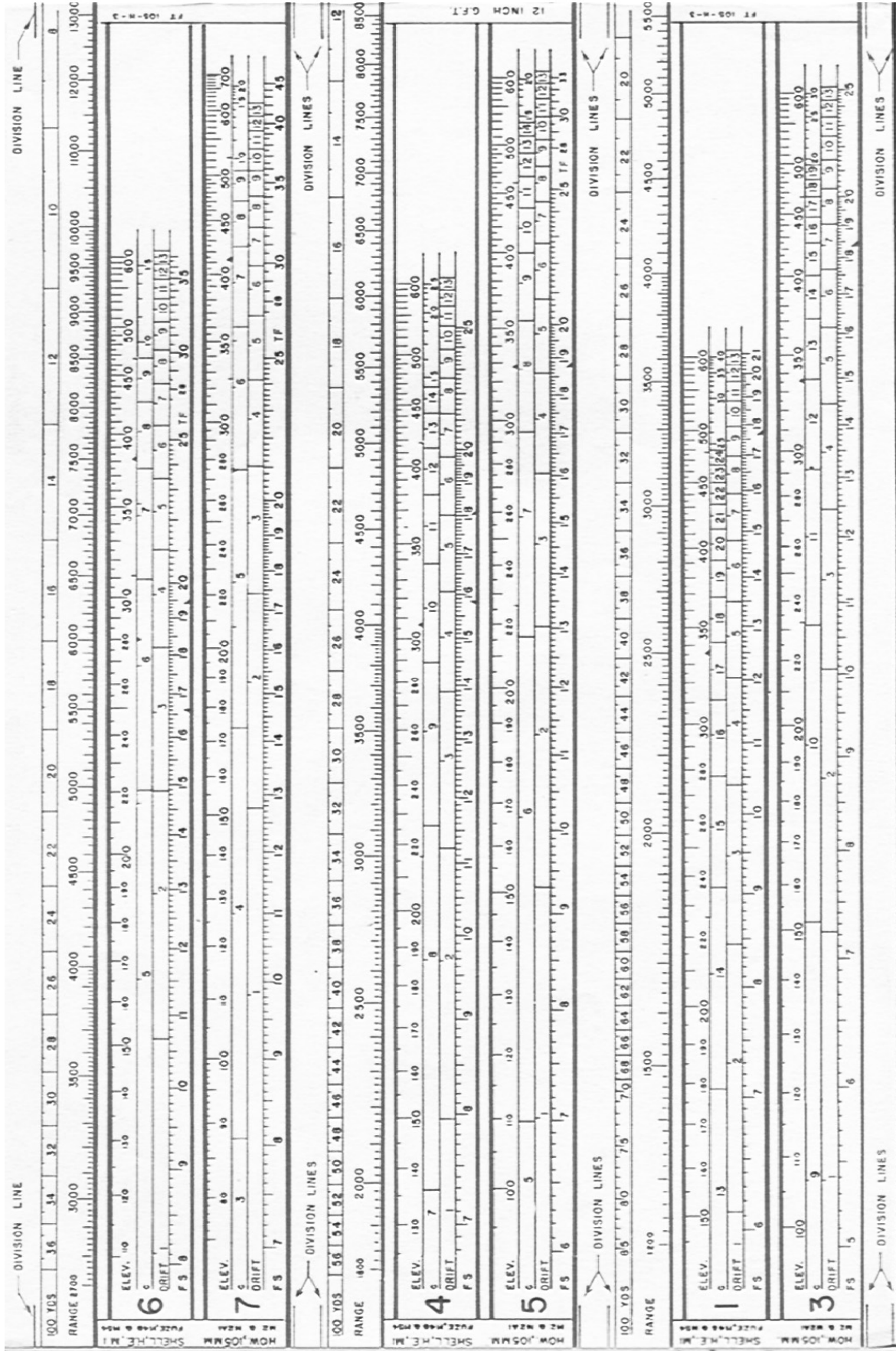
Move the hairline the range 5,430 (see Fig. 3). Read site increment for 20 yd. height of burst as 4 ( $0.2 \times 19$ ). Read elevation as 241 under the adjusted elevation gage line, and fuze setting as 16.0 under adjusted fuze setting gage line. Drift and *c* if used should be read corresponding to the *adjusted elevation gage line*.

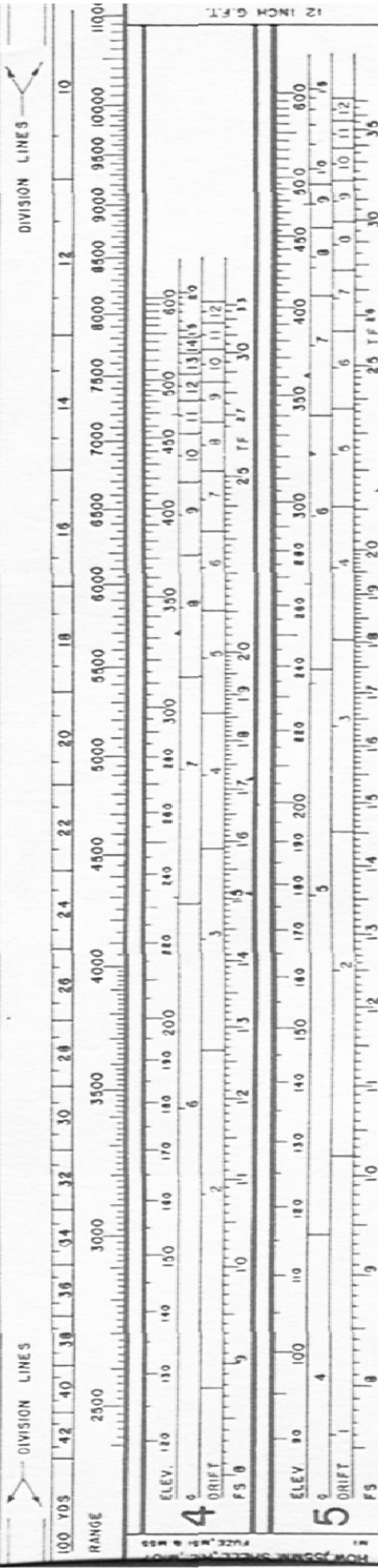
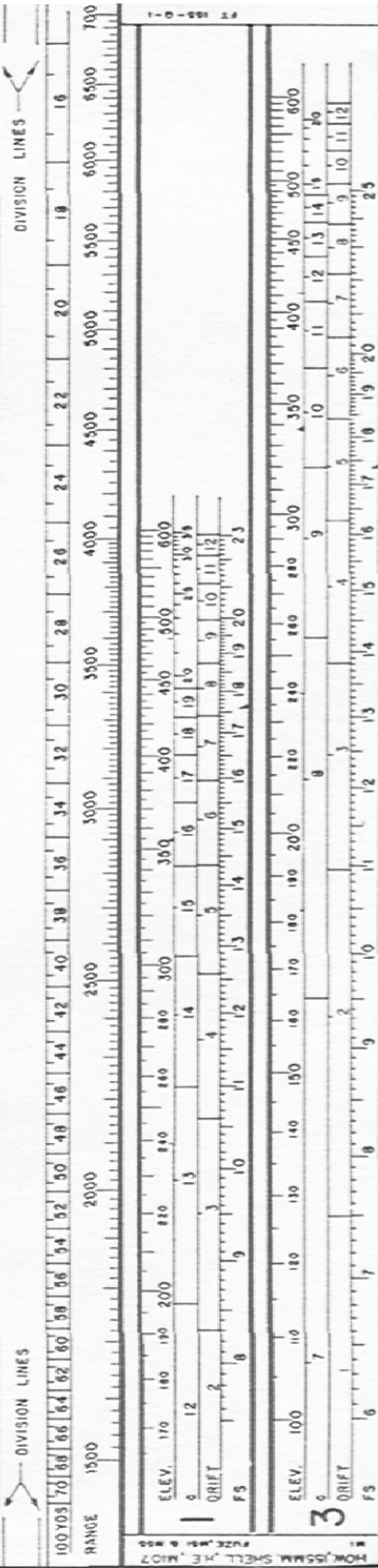
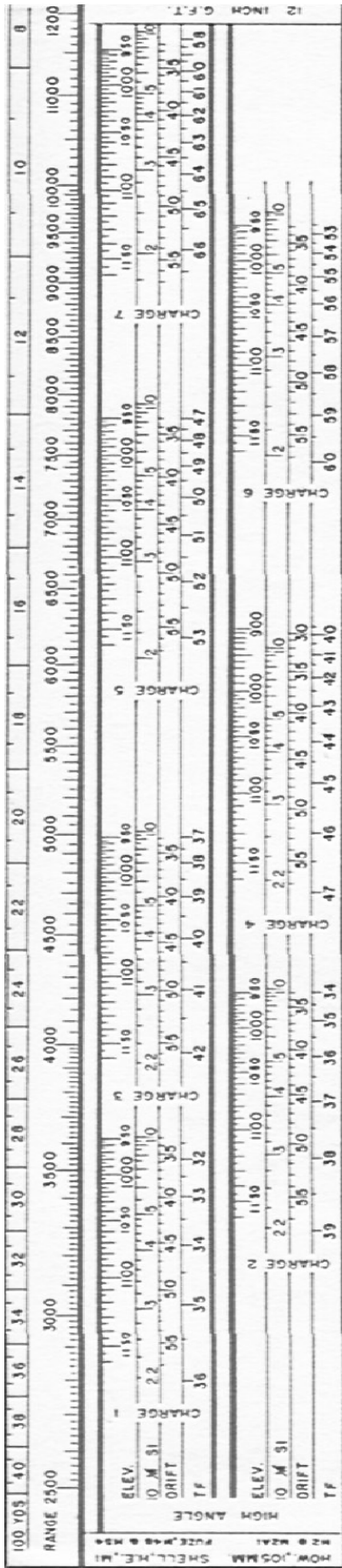
Besides its compactness, the 12-inch GFT offers several advantages over the 16-inch slide rule model GFT. Most important, the elevation and fuze setting corrections can be set off for several charges simultaneously so that targets can be taken under fire using various charges successively without the

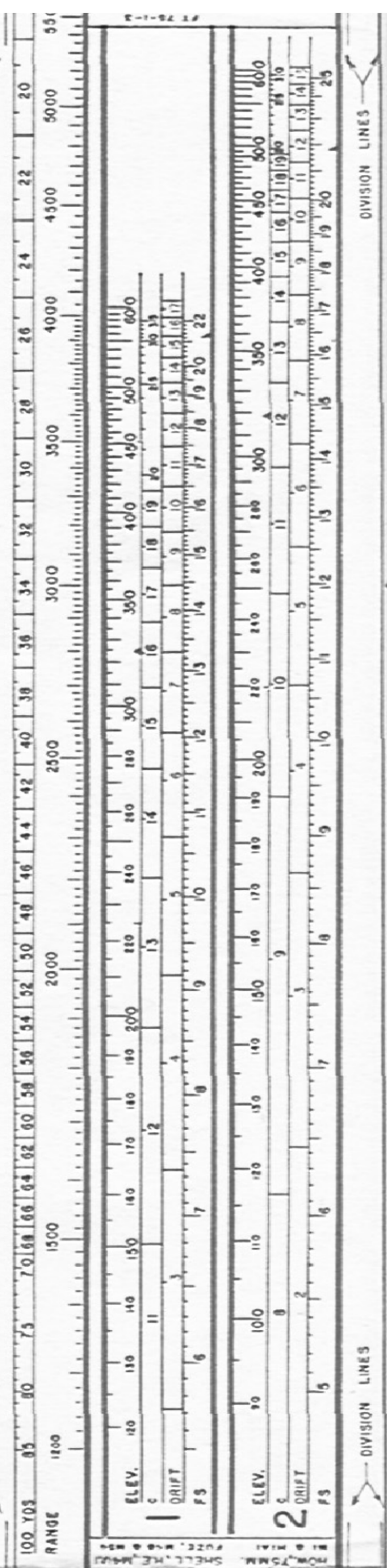
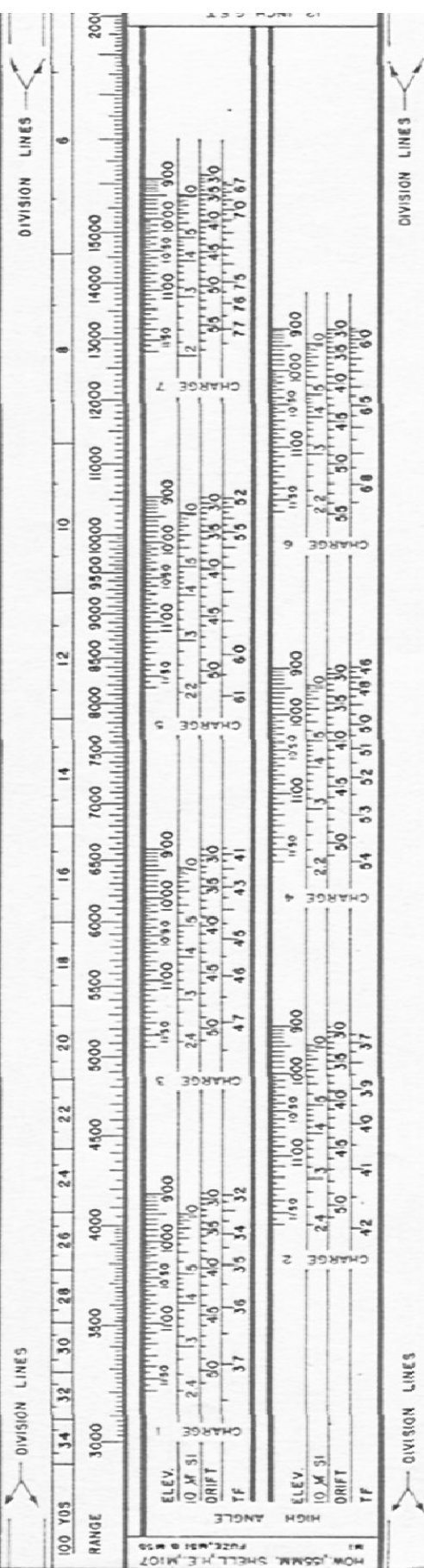
# THE FIELD ARTILLERY JOURNAL -- May, 1944 -- Section II

## FIRING TABLE SCALES

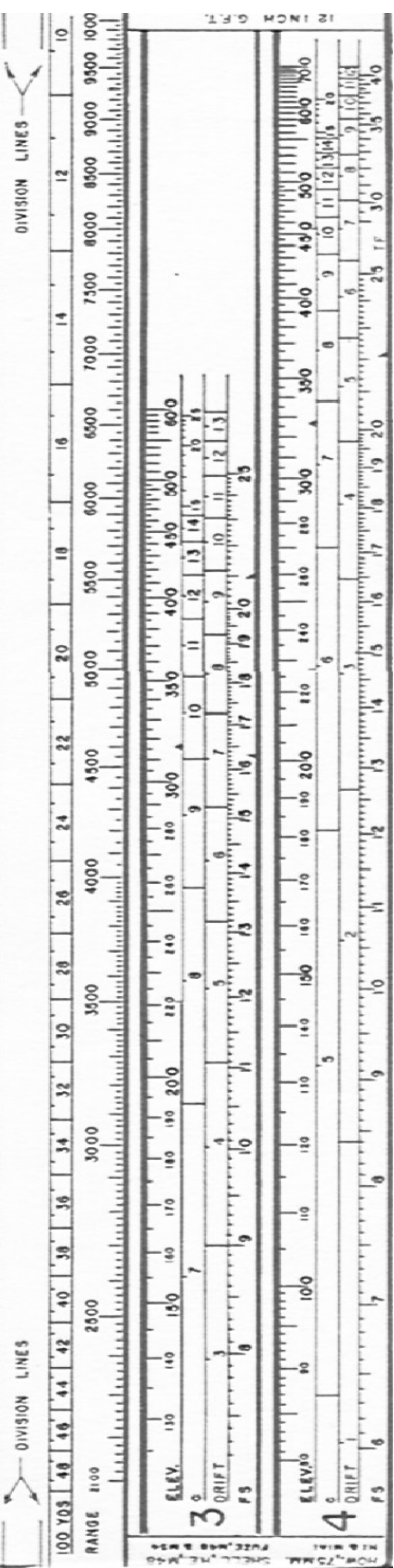
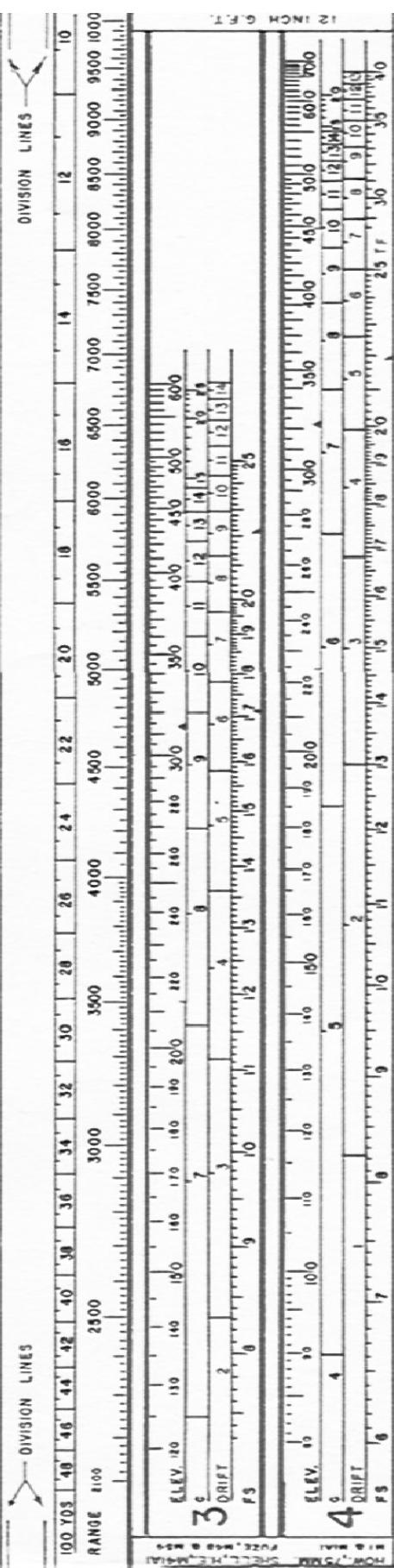
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Fort Sill, Okla. L-1179











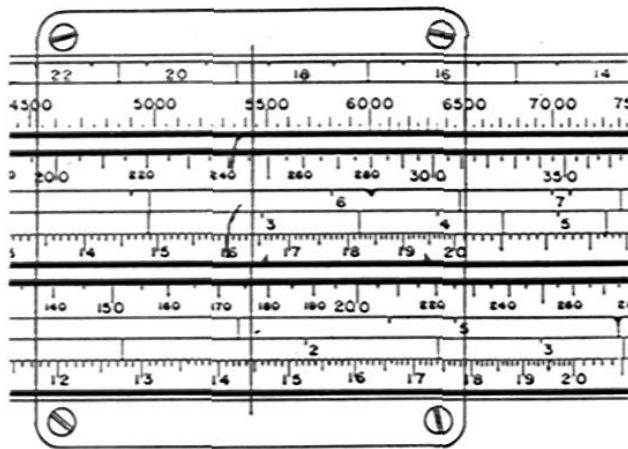


Figure 3

inconvenience of changing slides. Next in importance is the fact that there is no chance of the slide getting out of adjustment or becoming stuck or lost, since there is no slide. Again, the best charge can be chosen at a glance after the range has been set. Other advantages become apparent as the rule is

used. As a matter of fact, as far as ballistic functions\* of the GFT are concerned, the 12-inch GFT performs all the operations possible with the 16-inch rule; permits the above operations which are impossible on the 16-inch rule; and does better most of the operations which are possible with the 16-inch rule.

Satisfactory 12-inch GFT charts for the 75-mm How., the 105-mm How. M2-A2, and the 155-mm. How. M1 are reproduced as Section II of this JOURNAL. Similar charts can be mounted on a board 2" wide by 11½" long by approximately ¼" thick. Manufacture of the indicator is left to the ingenuity of the individual making the rule; it should be not less than 2" and preferably 2½" long.

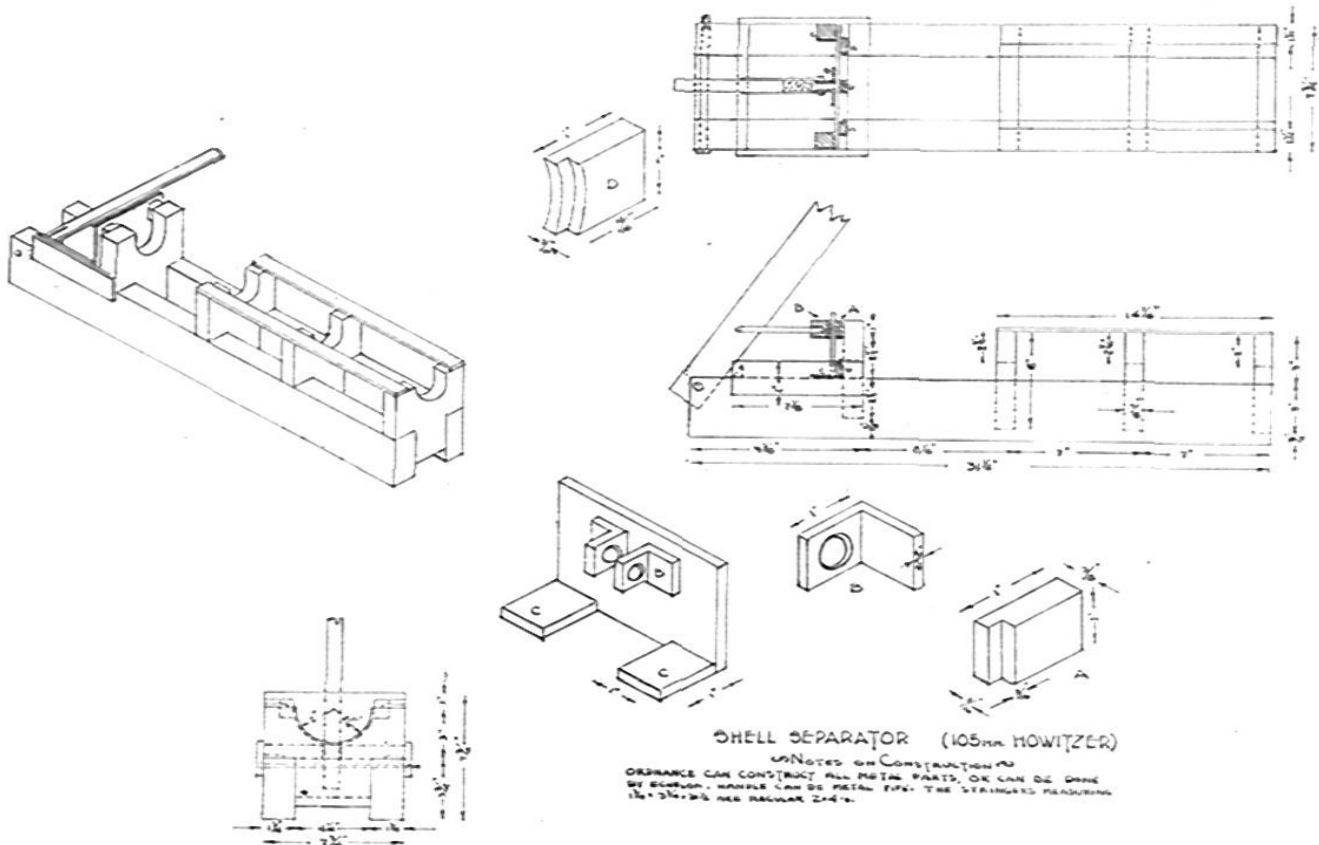
Scales for the 105-mm How. M2-A2 are perfectly satisfactory for the 105-mm How. M3, since the only difference in the range elevation relation for these two weapons is the jump, and this is automatically compensated for in setting off the registration correction.

\*"Ballistic functions" refers to the use of the GFT as a true firing table in contradistinction to its use with a mathematical slide for ordinary slide rule computations.

## PLANS FOR SHELL SEPARATOR

On page 629 of this JOURNAL for August, 1943, was described a simple, practical shell separator devised by Pvt. Vern D. Bowles. His little machine permits one man to "tailor" a round in 3 seconds. Its low silhouette and horizontal operation provide for minimum exposure of the operator.

The accompanying drawings, received from Lt. John E. Barth, show a revised method of building the separator. This new construction requires even less metal, and also makes use of standard 2x4s. According to Lt. Barth, this device works perfectly. We pass it along for the benefit of all 105 units.





# CROSS-RULE COORDINATES

By T/3 James W. Pool, FA

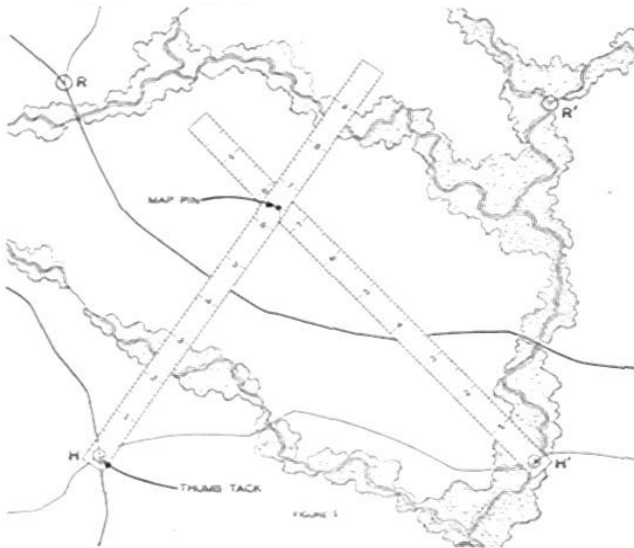
Cross-rule coordinates offer a rapid, accurate, and secret means of designating points on gridded or ungridded maps or photos of any scale. The system requires a minimum of equipment, little prearrangement, and can be taught to key personnel in a few minutes. By observing certain minor precautions, points can be located consistently on a map of 1:20,000 scale with a maximum error of 20 yards. Such accuracy allows the use of the system in unobserved fire.

The necessary equipment is two rules, two thumb tacks, and a map pin. The rules should be made of celluloid, plastic, or other durable material, and graduated on a decimal system. Successful experimental sets were on a 1:20,000 scale (10,000 yards long) with graduations at 1,000-, 500-, 100-, and 50-yard intervals. Points between the 50-yard graduations were interpolated by estimation. Rules are perforated in center of the zero line with a hole large enough to insert a thumb tack.

In the area of operation on the map or photo points of origin are selected in pairs, each point of the pair being separated by approximately the length of the rules to be used. These origin points should be easily identified terrain features. The use of grid intersections should not be made a practice.

Each pair of points is then assigned a code letter, which will precede any coordinate located from those points. The users of the system attach the rules to the map or photo by putting a thumb tack through the hole in the end of the rule, then pushing the thumb tack through the point of origin, *as accurately as possible*. The rules must be free to turn on the thumb tacks, but without appreciable "play." A map board or other solid backing is necessary if the rules are to be attached firmly to the map or photo.

In Fig. 1, the origin points selected are the crossroads at H and



the stream crossing at H'. The user, desiring to find the cross-rule coordinates of his position, first locates himself by orientation. He then places a map pin at his position and crosses the rules on the pin. His location is given as H621732.

The letter "H" designates the points of origin used. The first three numbers (621) are the distance up the left-hand rule from the point of origin, and the last three numbers (732) the distance

up the right hand rule from the other point of the pair.

If the user wishes to locate a point on the map that is beyond the limits of the rules at H and H', he moves the rules to points R and R' (or to any other pair of pre-designated points) and precedes the coordinate with the letter assigned to those points, in this case "R." Thus any other personnel plotting the point will know what points of origin were used.

Units using the cross-rule system may make the designation of origin points a more elastic and secret procedure by establishing a prearranged plan. For example, if a forward observer wishes to locate a point that is beyond the limits of the origin points in current use (other points not having been pre-designated), he may establish two new points. These would be located in relation to the points in use. Then the third point would be located in relation to the two new points, and the coordinate preceded by a prearranged code letter.

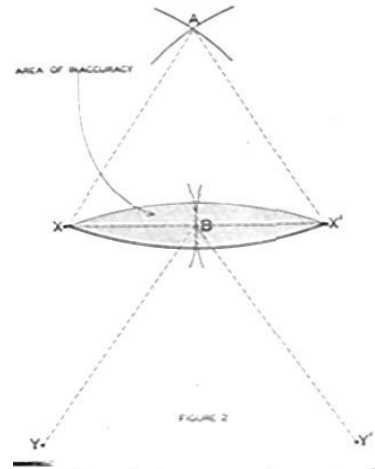
In plotting a cross-rule coordinate on the map or photo the process is a direct reversal. For example, if the coordinate given were H436641, the plotter first makes certain that his rules are on points H and H'. Next he finds 436 on the left-hand rule and 641 on the right-hand rule. The rules are then crossed so that the two points touch, and a map pin is placed at their intersection. The rules can then be swung to either side so as not to interfere with reading the map or photo.

There is one main precaution to be observed. The principle of the system is that of the intersection of arcs with varying radii. In Fig. 2, the point A is located by the intersection of arcs formed by the radii XA and X'A, and the angle of intersection allows an accurate plot of the point. At point B, however, the arcs created by the radii XB and X'B do not intersect—they merely touch, and the point where they touch is difficult to determine. The same is true of any point within the elliptical area shaded in Fig. 2.

But there is a simple solution. The point B can be accurately located from another pair of points, such as Y and Y'. At point B the arcs created by the radii YB and Y'B will intersect sharply as at A. This illustrates the necessity of using more than one pair of origin points with the cross-rule coordinate system. Points which fall roughly between two points of origin must be located in relation to another pair of points if an accurate plot is desired.

Other precautions are obvious. Points of origin must be kept secret, and if possible should be designated before actual need for them arises. Rules used must be long enough to cover a fairly large area, so the map will not be cluttered up with origin points. Rules should not be so long, however, as to be awkward to use or subject to breaking at the ends.

Inaccuracy in placing thumb tacks on the points of origin will result in a proportionate inaccuracy in any coordinate located from those points. Which rule is to be read first must be prearranged (left-right, upper-lower, etc.).



# MOBILIZING YOUR THOUGHTS

By Maj. W. P. Woodruff, FA

## Part I—The Elements of a Study Situation

Conditions which affect study are never neutral—they either aid or retard learning. For that reason we must know how to combat unfavorable conditions. Any military man knows combat situations are formed by the nature of some rather specific elements. For example, *terrain* (is it rough or smooth? is there heavy vegetation or desert?), *status of training* (battle hardened or maneuver scratched), *weather* (hot or cold, wet or dry), *number and disposition of opposing troops*, *materiel* (amount and quality), *supply*, etc. Similarly, any study situation is determined by the nature of some very specific elements: (1) *the Place* (where you study), (2) *the Person* (you or the other soldier who does the studying), and (3) *the Work Schedule* (plan for study).

### 1. THE PLACE

*a. Atmospheric conditions.* The best combination is: 68° Fahrenheit, 50% relative humidity, and 45 cubic feet of outside air per person per minute. Of course cool fresh air is a distinct help and ordinarily you can keep the room temperature to 68 in winter, but in many camps you will have to study in summer when the temperature won't get down to 68 even at night! While circulation has been found to be at least as important as fresh air, usually there are no electric fans available to circulate the hot, still air. It won't do any good to run around with a thermometer, barometer, and airometer proving that conditions are not ideal. You'll probably have to take refuge in this established fact: *even hot stagnant air does not materially retard learning when the work is undertaken with a will to conquer and you do not stay at the job too long.* So there goes the good old summer excuse, "It's just too hot to study." Nonsense! It's never too hot to study when the existence of your country is at stake.

*b. Constancy.* It is particularly desirable to use consistently the same place to study the same subject. At least you can do better than studying service of the piece, for example, in the barracks one day, the latrine the next, and at the PX another time.

At any particular place there are usually some distractions over which you have no control, but it happens that the noises at any one spot are about the same in kind and volume at the same hour each day. For example, trains pass at about the same

time each day; barracks fill and empty for mess, drill, etc., about the same time each day; traffic has its rather specific hours of peak loads. By using the same place to study a subject you get accustomed to the distractions; becoming progressively less noticeable, they interfere less with your studying.

#### *c. Materials and equipment.*

(1) Use a table or desk. You get lazy too fast on a cot.

(2) Have on the study table only the materials you need. This saves time; you don't have to pick through a mass to find the item you need. It also aids concentration, because you don't have extraneous objects present to take your mind off the job at hand. When studying small-T precision it is no help to have FM 25-10, *Motor Transport*, lying there in plain sight to take your mind off small-T. And when working on FM 25-10 you don't want FM 6-40 in the way.

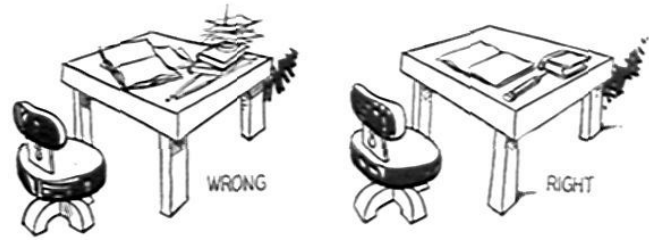


Figure 1

If one can so condition himself that he is not bothered by outside noises, can he overcome being bothered by a clutter of study material? Obviously, yes. But why go to the trouble of conditioning yourself to a situation which you can control? You have no control over the noises (unless the noise be your own radio)—but you *can* control the neatness and arrangement of your study materials. Why not use the extra effort working on your subjects rather than in overcoming distractions you can physically eliminate?

(3) Get all the equipment you need. This is a necessary corollary to having only the materials you need. There is no use pestering yourself by jumping up every five minutes to go hunt some extra item.

AUTHOR'S NOTE: Paragraph 24 b (3), TM 21-250, *Army Instruction*, states in part:

**If students are expected to study outside the class period, it may [sic] save time in attaining the objectives of the course to give them help in the techniques of self-studying. Many soldiers (that includes officers) are not familiar with the most efficient ways of using reference and supplementary materials and will profit from whatever hints the instructor can give them.**

Being unable to find any official publication on self-studying I have collected scientifically proved data on the subject and then tied those thoughts down to the brass tacks of field artillery training. Of the huge number of recognized authorities consulted, the following were particularly useful:

**Pennington, Hough, and Case, *The Psychology of Military Leadership***  
**H. E. Garrett, *Great Experiments in Psychology***  
**A. W. Kornhauser, *How to Study Efficiently***  
**R. A. Davis, *Psychology of Learning***  
**W. C. Varnum, *Psychology in Everyday Life***

For purposes of organization these notes will treat "how to study" from two points of view: Part I: The Elements of a Study Situation, and Part II: Study Procedures (the mechanics of studying).

d. *Lighting.*

(1) Have uniform distribution. Half a page in good light and the other half in shadow needlessly causes eyestrain and fatigue. You either take longer to do the job or have to quit before the work is completed.

(2) Daylight is best. The closer electric lighting approaches this both in amount and quality, the better. Caution: a colored bulb may or may not produce the quality of light desired.

(3) Indirect light is better than direct. Indirect light produces less glare; further, attention is not diverted from the FM to the source of light itself.

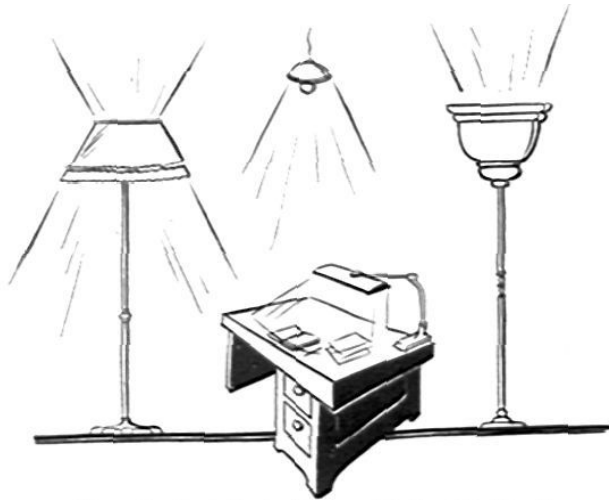


Figure 2. Semi-direct, direct, and indirect lighting\*

Your probable use of this third point: (a) If you see fit to spend some of your money on one of the few remaining desk lamps, don't waste your money on one which showers light directly on the desk. (b) Where direct lighting must be used, lower intensity is less fatiguing than high intensity.

## 2. THE PERSON

Fatigue and boredom materially decrease the effectiveness of study. Mental fatigue is very difficult to produce. With high interest, prolonged mental work may be done with little loss of efficiency. While mental effort is frequently given as the cause of nervous breakdowns, experiments in mental fatigue show little or no mental fatigue resulting from the ordinary hard day's work. Eyestrain, posture, atmospheric conditions, and health are important factors contributing to what is erroneously called "my tired mind." What is frequently called "mental fatigue" is usually physical fatigue or boredom. Physical fatigue is significant because when it exists energy is low and interest sags. Boredom is caused by doing the same job too long, and results in inattention. Both fatigue and boredom can be eliminated from the study period by:

a. *Keeping interest high.* Keep your mind's eye on why the work must be mastered and its importance in the efficient training of your battery. The information must be mastered because you have to use it right away in training. In addition to that personal or selfish objective, there is the ultimate factor that your men must fight on the training you provide. As someone well put it, "Got to be damned certain no boy's ghost will ever say: 'If the training program had only done its job!'"

\*Reprinted, after considerable modification, from Varnum, *Psychology in Everyday Life*, page 23, with permission of McGraw-Hill Book Company, Inc.

b. *Breaks.* Take a rest either before beginning a new "bone point," or on a rather arbitrary time basis. Periods of more than 30 minutes' concentrated study are relatively unproductive. One hour is an outside time limit. Very high interest in a subject may enable you to study profitably that long, or the nature of the subject may demand it. For each of us there is some phase of artillery training which is more difficult than others. This personally difficult subject needs more study than others, and we ordinarily have difficulty "getting in the groove" trying to study it. Similarly, there are the highly technical subjects (like theory of radio) which are difficult for most people. In either case take a tip from the sprinter: "warm up" before attempting the main effort. One way to warm up mentally is to scan notes of previous work on the subject.

Even though the break should not be longer than 10 minutes per hour, it must be real. Don't continue sitting at the table—get up and move about, get some fresh air, wash your eyes.

Physiological factors demand use of breaks in basic training as well as at service schools.

c. *Competition.* Strive to know more about field artillery than any other field artilleryman. When you arrive, begin competing with yourself. Like fruit, as long as you are green you will continue to ripen; once you get ripe you begin to rot.

d. *Change.* Variety is necessary to relieve the mind and thereby counterattack boredom. Shakespeare provided variety in his tragedies by using humor; e.g., the grave-digger scene in *Hamlet*. In studying, variety is provided by changing to a different subject. The more radically different the subject the greater the variety and reduction of chance for confusion. For example, if you are working on communications, switch over to some gunnery. Or, if all the next day's training is to be communication, go from operation of the switchboard to encoding of messages.

In training change can be accomplished by:

(1) The arrangement of subjects in the battery training schedule. This rules out the "block system" which most service schools had to adopt due to limitations in space and of troops.

(2) A different method of training. For example, go from conference to demonstration or application. See Fig. 13, TM 21-250.

(3) A different technique of executing the method being used. For instance, several changes possible in executing the conference method were mentioned in *Notes on Thawing Your Class*, FIELD ARTILLERY JOURNAL, January, 1944.

e. *Health.* This is the best rebuttal to physical fatigue. When you are in poor health you tire easily and your mind wanders. Ways to beat fatigue include.

(1) Sleep. You may need more or less than the generally required eight hours. Get what you need.

(2) Sick call. Make it even though the ailment seem minor, like a cold, small cut, or aching tooth, ear, or eye. While the opportunity of "gold bricking" will be accepted by some, fakes still are in the minority.

(3) Exercise. This is usually no problem in the field. Being a "chair-borne artilleryman" too long is what ruins one. Those who have essentially desk jobs are probably familiar with Section II, TC 118, 10 May 43, which states the requirements for participation in exercise.

(4) Eating.

(a) Type and quantity of food. Expert dietitians provide a balanced diet, but the amount of food taken is largely an individual problem.



# HIGH ANGLE FIRE PLUS 6400-MIL FIELD OF FIRE

By Lt. Scott A. McKinnon, FA

The mission assigned our 105-mm howitzer battalion in the last campaign was to give fire support to any unit along the perimeter, plus any necessary fires in case the beachhead was attacked from the sea. That summed up to one thing: a 6400<sup>m</sup> field of fire which, in itself, was not particularly difficult. Due to the dense vegetation, however, and the desire to retain all natural camouflage, it was necessary to use high angle fire.

To combine the two presented a problem in that a recoil pit for a 6400<sup>m</sup> field of fire develops into a circular trench with a centerline radius approximately the same as that of the wheel axles. For that reason, some provision must be made for supporting the wheels.

Our first attempt to overcome this handicap was to completely fill the trench with sand bags, except that portion necessary as a recoil pit for the current firing. Shifting of the howitzer was then found to be exceptionally difficult due to the softness of the sand bags over which the wheels moved.

Two-ply mats were then constructed from ammunition crates. By using two mats for each wheel, one would always be free to be placed in the direction of the wheel's intended travel. This did make the shifting of the pieces somewhat easier, but the time was still excessive. Sand bags had to be moved from one side of the recoil pit to the other, and of course the mats had to be shifted. Other procedures were tried in order to shorten the time interval—such as rolling the piece forward, preparing the pit as desired, and then jockeying back into position. But however we tried, there was still a certain amount of backbreaking work to be done, and although we felt that we had reduced the time to the minimum we were still constantly harassed by the repeated question from Fire Direction Center, "What's the delay?"

During a lull in the firing on the second day the Section Chiefs were assembled and requested to make any suggestions they might have that would reduce the work and thereby speed up the shifting. We discussed building platforms in sections, strong enough to withstand the terrific downward pressure



exerted in high angle fire. Several points arose to discourage that suggestion. First, the timber for the platforms would have had (at that time) to be hewn from logs, as all available timbers were being used by the Engineers in the construction of bridges, etc.; one would have probably met with more success if he had asked for G-4's right arm! Then too, the soil being sand and so little of it remaining undisturbed inside the circular trench, it was felt that it would soon crumble under repeated impacts.

Finally one of the Section Chiefs remarked that "if these howitzers only had firing jacks like the later models of 75-mm guns, shifting would be much easier." That was food for thought. What about using hydraulic jacks like those furnished with our 6×6, 2½-ton prime movers? The first discouraging fact was that each battery had only two prime movers so the jacks could hardly be borrowed from them. Just the same it could be tried, so a jack was secured. One of the pieces was reported "out," the jack was placed in the middle of the axle, and with axle locks in firing position the piece was raised. It balanced perfectly, and very tenderly the trails were moved a short distance. It worked! Now our problem was to find four jacks.

Almost anything except jacks can be found in an area that has been fought over, so it was a case of finding disabled vehicles and securing their jacks or begging them, for no such articles are brought into the combat zone as replacement equipment.

On one scouting tour I had the driver stop for three Marines who thumbed us for a ride. We learned that they belonged to a tank outfit and that their jacks (two per tank) were very seldom, if ever, used. We drove them to their area and contacted the Executive Officer, who readily agreed to give me all the jacks I wanted if I would search them out of the tanks in the tank park. Nine were found, five of which were in operating condition and the remainder repairable.

Half-inch sheet steel was obtained and four 15"-square plates were cut to be used as base plates for the jacks, plus four plates to be used on the axles to insure against the jack heads' slipping. U-bolts, made by the battery mechanic from rods taken from ammunition cloverleaves, were used to hold the anti-slip plates to the axles. FDC was asked to call one piece "out" for as long as was necessary to prepare the pit,



with the assurance that it could be readied in a short time should it be needed. The request was granted. The rest of the work was completed in less than an hour.

As mentioned above, the area of undisturbed soil inside the circular recoil pit was very small, and in danger of crumbling if any great weight was applied. To overcome that possibility a gasoline drum was cut in two and one half driven into the center of the pit until its head was flush with the surface of the ground.

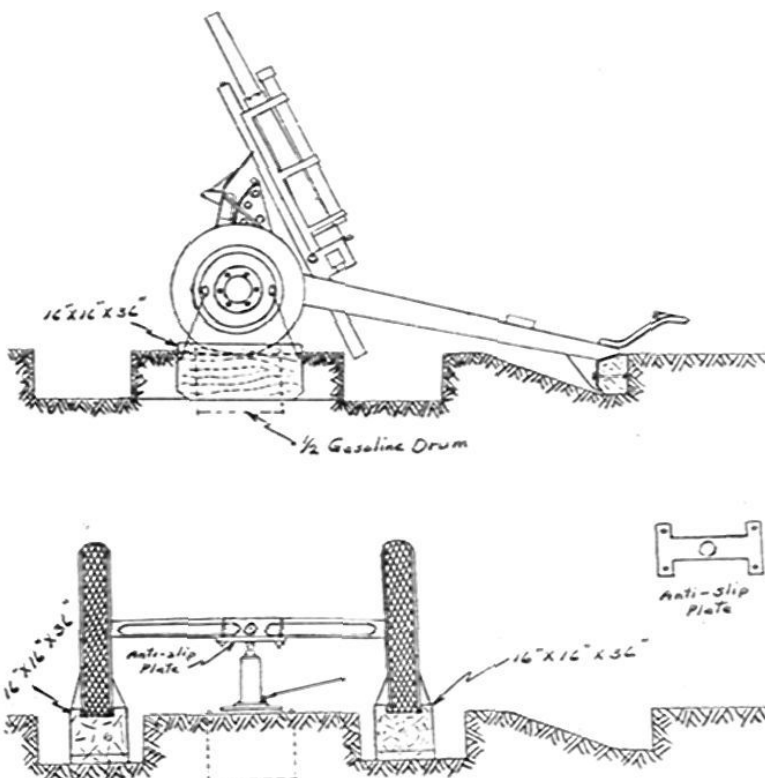
The axle of the howitzer was then centered over the drum head, which held the 15" square plate and the jack. Since the existing trail trench had been dug as needed and was not round, with the piece raised and axle locks released the trails were dragged around to scar the surface in a perfect circle. A new trail trench was then dug to accommodate the right trail (approximately 2" longer than the left trail), and we graded the area between trail trench and recoil pit to give proper clearance for the trails.

During one of the operations, with the tube at high elevation the piece tended to roll off the jack to the rear. This was easily remedied by lowering the tube to about zero elevation in the center of traverse, thereby more equally distributing the weight on opposite sides of the jack.

The above work insured speed in shifting and considerably reduced the labor, but still the old bugaboo existed of having to move sand bags and mats for wheel supports.

We found that the recoil pit should be approximately 14" deep, and that with 16"x16"x36" timbers grooved lengthwise (to accommodate the tires and thus keep the wheels from jumping or slipping laterally) the pit could be left completely open. All that was necessary then was to place the timbers properly before releasing the jack. Later, using the two valve stem holes in the wheel disc, the blocks were loosely wired to the wheels so that when shifting the piece, the blocks were carried around the trench; only a slight adjustment, if any, was then needed to set the timbers in place. Coffin handles (made from ammunition cloverleaves) were affixed to the ends of the blocks to facilitate handling.

It was also found that while shifting the piece the brakes should remain set, as the blocks will tend to swing backward and forward and will eventually stub against the bottom of the



recoil pit. After the jack has been released and the weight is again on the wheels and blocks, the brakes should be momentarily released to relieve any residual torque.

Thus we gained the speed desired, and a further reward of less expenditure of manpower—which is very desirable during prolonged firing.

Feeling rather "heady" over our achievement we then looked to our next time-consuming operation of moving trail logs. The answer to that problem was found to be timbers shaped to fit the trail spades, which also equalized the lengths of the trails. These fitted trail logs, 30" long, were bolted to the trail spades, permitting the trail trench to remain a perfect circle by eliminating the digging-in action of the spade.

All four howitzers were fitted with the above described devices and their operation carefully checked under actual firing conditions. Practicability of the aids was definitely proved, resulting in their adoption by the other batteries of the battalion.





# JAPANESE MANDATED ISLANDS

By Col. Conrad H. Lanza

In 1914 Japan (as required by her then treaty of alliance with Great Britain) declared war on Germany. Incidental to this she acquired by conquest certain German territories in the Pacific Ocean, the

**Palau Islands,  
Caroline Islands,  
Marianas Islands (less Guam),  
Marshall Islands.**

These islands were not fortified and had no garrisons. Occupation was accomplished without resistance.

In 1919 the Versailles Treaty recognized Japanese jurisdiction over these islands as a Mandate for the League of Nations. By treaty Japan subsequently agreed not to fortify the islands, the United States engaging on its part not to add to fortifications in the Philippines or at Guam.

The Palau, Caroline, and Marshall Islands form a belt 2,900 miles long from west to east, extending over 42° of longitude. The majority of these islands lie between 5° and 10° North Latitude within a strip but 350 miles wide. The Marianas Islands lie at a right angle to the main belt, almost on the meridian of 146° East Longitude; their north-south length is about 500 miles.

The islands are divided into two classes—volcanic and coral. It is very probable that in ages past, all of them were active volcanoes. On their slopes, below water level, coral formations grew, eventually rising to the surface. This is why the coral formations, which have become reefs, are approximately circular in shape: they surrounded conical volcanoes.

At this date some of the active volcanoes still exist. Other volcanoes remain, but are extinct. There has been, and there seems to be still continuing, a slow subsidence of the Pacific area. Volcanoes which have become extinct gradually disappear by sinking into the sea. As they do so the coral builds upward, maintaining its top at sea level. In time nothing remains except the coral, now called an atoll, which retains its circular form but which encloses a water surface where before was a mountainous island. This enclosed area is the lagoon. Most lagoons do not have water depths exceeding 150 feet.

They usually have good anchorages.

The present coral islands are therefore remnants of ancient volcanoes, now submerged. As coral does not grow above the water level, all coral islands are low: maximum reported elevation is 33 feet, which is unusually high. The islands are formed from broken pieces of coral (which may be in the form of sand) and from vegetation.

Coral soil has a lime foundation on which vegetation is restricted, though coconuts and some hardy grasses grow readily. The coconut tree was the main source of life. Its fruit furnished food and milk. Its leaves could be woven into thatch for buildings or into clothing. The trunk of the tree furnished the framework of the simple houses of the natives, which in general consisted merely of a roof supported on poles. From this useful tree could be constructed fishing boats, including their sails. Fish are plentiful around the islands, and large quantities are found in the lagoons. Coconuts and fish were the basis of life before the advent of the white man. Due to lack of resources the standard of life on the coral islands used to be low.

Volcanic islands have a fertile soil. Most tropical or semitropical plants grow readily. Vegetation is dense and luxuriant. The high ground intercepts rain at all seasons, whereas on the coral islands rainfall is often so meager as to cause a water shortage even for the sparse local population. Stone is available on the volcanic islands for building purposes. The great variety of agricultural products made it possible in times past for the natives to maintain a relatively high standard of life, as compared with those on the coral islands.

Due to contact with civilized races—Spanish, then German, and finally Japanese—standards of life have gradually improved. On the coral islands certain varieties of sweet potatoes, special kinds of bananas, taro, and some other crops have been introduced. On the volcanic islands a wide variety of products have been imported and are now in production; these include pineapples, oranges, papayas, mangoes, cashew nuts, ginger, pomegranates, cassava, sugar, tobacco, cotton, etc.

On most islands are domestic animals. These include the water buffalo or carabao, horses and mules of small size, pigs, goats, etc. Wild pigs and deer are found in the jungle of the volcanic islands.

Pests are not numerous. The rat, undoubtedly introduced by visiting ships, is almost everywhere. Centipedes and scorpions are common; their bite is painful but not dangerous. Mosquitoes are general, and bats common.

From a military point of view there is a marked difference between the two types of islands. The coral islands are not only low, but seldom exceed a mile or two in width. Gun fire from warships can sweep every bit of their surface. On the flat terrain buildings and fortifications are usually readily discernible either from the sea or from the air. Beaches are smooth, flat, and with gently sloping surface. On the ocean side the surf may be high, on the lagoon side



the sea is nearly always tranquil. There is little difficulty in beaching landing craft.

Volcanic islands have shore lines of beach, of rocks, and of swamps. Beaches suitable for invasions are restricted as to size and number. Mangrove swamps along the coast are not infrequent and form almost an impassable barrier to landings. In places the mountains rise steeply from the sea, without any beach at their foot.

In the interior the volcanic islands have jungles, difficult to fight over. There are some nipa swamps. In the uplands occur open spaces devoid of trees. This is frequently covered with a species of sword grass, about six feet high and very dense. It is more of an obstacle than nipa.

The volcanic islands afford high sites for defensive works. On account of their altitude, their size, and their rough and uneven surface, it is impracticable to cover the volcanic islands with gun fire. Possibilities for camouflage and shelter are good. Volcanic islands have superior defensive conditions.

All islands or groups of islands have an encircling coral reef. The top of the reef is in part above sea level, in part awash, and partly below sea level. In the coral islands those parts of the reef which are above the sea form a chain of islands or islets around a lagoon, forming an atoll on which all installations are established and where people live. On the volcanic islands parts of the encircling reef above water are usually unoccupied, all installations and people being on the enclosed high islands.

The encircling reefs have passages through them by which ships can reach the inner waters. The passages in volcanic islands are opposite stream lines which discharge considerable fresh water into the sea. Coral can not live outside of salt water and so fails to build in sections containing less than the usual quantity of salt. Where the mountain and its streams have disappeared, the break in the reef remains opposite where the fresh water discharge used to be.

It is usually practicable to mine the passages through reefs: they are limited in number, the water does not exceed the ordinary mining depths, and currents through them are not too swift.

#### PALAU ISLANDS

These islands are shown in some maps as the Pelew or Pellew Islands. They extend about 80 miles in a northeast-southwest direction, with the center at Latitude 7° 30' North and Longitude 134° 30' East. They are about 550 miles east of Mindanao in the Philippines and nearly the same distance north of the northwest end of New Guinea. They are often considered to be part of the Caroline Islands, the nearest of which are 250 miles to the northeast. The Palau Islands are inhabited by a different race from the peoples in the Carolines and are more properly classified as separate, which they are politically.

The main island, Babelthuap (Babeltop or Babelthuop on some maps), is a volcanic island 30 miles long and with a maximum width of 9 miles. There are two volcanic cones, the higher one (near the center of the west side) being 643 feet high. Babelthuap has received a large Japanese immigration. It is highly cultivated.

Off the south end of Babelthuap is a small island—Koror. This is reported as the main harbor.

The remaining islands of the groups extend southwestwardly from Koror. They are all small and some have become complete coral islands.

All islands are encircled by the same reef. This is within 1 to 5 miles off shore on the east side but is 10 miles off westward from Koror. Within is the main anchorage.

The islands are supposed to be self-supporting as to food. The Japanese gave special attention to this, and reports are that from this point of view they are independent of any blockade.

From the east there are 3 entrances to the lagoon west of Koror—no lagoon on the east side as the reefs are close to shore. On the west side there are two entrances, one each at the extreme north and south ends. Entrances are close to islands, and subject to gun fire.

One island—Angaur—is outside the reef. About 3 miles in diameter, it lies 8 miles below Peleliu Island, the southernmost of the main group. On Angaur is the small harbor of Saipan.

Occasionally during July, and frequently from August to November (both inclusive), typhoons are liable to occur. They may seriously disturb amphibious expeditions.

#### CAROLINE ISLANDS

This is the most extensive of the mandated groups. It consists of about 50 small groups, containing over 550 islands. It spreads over 1,800 miles between East Longitudes 135° and 165°. Its breadth from north to south is not over 350 miles, between North Latitudes 5° and 10°. The group includes both volcanic and coral islands. The most important islands are the volcanic ones.

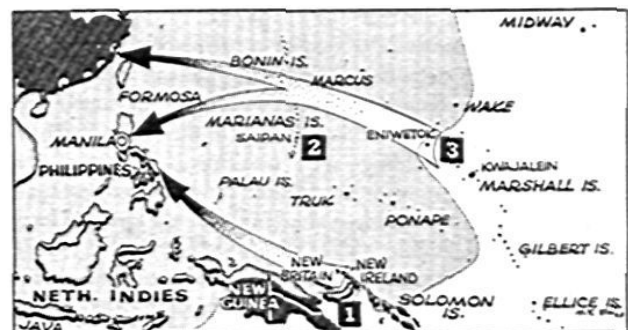
At the northwest extremity is Yap, a cluster of three islands—Yap, Map, and Riquen, all volcanic. The surrounding coral reef is just off shore. The harbor is the passageway between Yap on the west side and Riquen and Map on the east. It is good, but narrow and not suitable for a main base; it is a good secondary base.

Yap has long had a certain importance. It is the meeting place for the cables from the Philippines, the United States, and Japan. Before the advent of radio stations this cable center was a military objective as a center of communications.

Yap has volcanic cones rising to 585 feet. The three islands are densely cultivated, and although not so reported probably are self-supporting as to food. This is the Japanese administrative headquarters for the western half of the Carolines. It is an air center, and as such of great value.

175 miles east and southeast of Yap are the Fais and Sorol atolls, small and respectively 65 and 89 feet above sea level. They are outlying air stations, and the last volcanic islands for some distance.

Eastward are found a number of coral atolls about which no definite information is available. 1,050 miles from Yap is



*The Pacific war had three recent foci. In the New Britain area (1) air and sea forces battered Japanese bases and communications. A carrier task force struck at bases in the Marianas (2), and the conquest of Eniwetok (3) cemented American control in the Marshalls.*

Truk. This island is the remnant of a large volcano which has not completely sunk into the sea. Portions remain above water and form some 20 islands and numerous islets and rocks. The center of Truk is at Latitude 7° 20' North and Longitude 151° 50' East. The encircling reef is roughly an equilateral triangle 116 miles around; its apex points west, the base running nearly north and south to form the east side of Truk. The principal islands within the reef are on the perpendicular from the apex to the base, or south thereof. Only a few minor islets are to the north.

Truk is commonly supposed to be the enemy's main naval and sea base in the south Pacific. It is more probably an advanced base. As such it contains numerous facilities for repair and supply, scattered through a number of the larger islands. Each island has an individual reef around it, and close to shore. Highest elevation is 1,422 feet.

Entrances for ships to the lagoon inside the main reef exist near both base angles, with two others in the base, one at the apex, and one in the north leg of the triangle near the apex.

Truk is strongly defended by batteries and mines covering passages through the encircling reef. Antiaircraft batteries are reported as numerous. At least 3 airfields exist. There are reports, not confirmed, that subterranean shelters have been constructed for submarines and to shelter the garrison and supplies.

There is probably some exaggeration in the partial descriptions of defenses which the Japanese have allowed to trickle out. Still, the place is defended and is an important base. The main group of islands is 5 to 7 miles inside the surrounding reef. None exceed 1,000 feet in altitude. They can not be swept by naval gun fire as can be done against coral islands.

A partial ring of coral islands encircle Truk:

<b>Pulusuk Island</b>	<b>175</b>	<b>miles</b>	<b>to</b>	<b>the</b>	<b>WSW</b>
<b>Puluwat Island</b>	<b>175</b>	<b>"</b>	<b>"</b>	<b>"</b>	<b>W</b>
<b>Namomito Islands</b>	<b>175</b>	<b>"</b>	<b>"</b>	<b>"</b>	<b>NW</b>
<b>Hall Islands</b>	<b>100</b>	<b>"</b>	<b>"</b>	<b>"</b>	<b>N</b>
<b>Nomoi Islands</b>	<b>175</b>	<b>"</b>	<b>"</b>	<b>"</b>	<b>SE</b>

Less than 500 miles eastward from Truk is Ponape Island. This has long been the administrative center for the Eastern Carolines, and has good administration buildings. It is a volcanic island, nearly circular, with a diameter of about 12 miles and a total area of 130 square miles. In the center are two volcanic cones having altitudes of some 2,000 and 2,600 feet. The harbor and town of Ponape are on the north side; smaller harbors exist on the east and south sides.

The entrance to Ponape harbor is covered by the fortified Jokaj Island, having a maximum altitude of 875 feet. The reef encircling Ponape is two to five miles out, with anchorages inside between the reef and the island.

Ponape was anciently inhabited by a prehistoric race. These unknown people constructed a harbor on the east side. They built huge breakwaters over 2 miles long, and reclaimed several square miles out of the lagoon inside the reef, on which monumental stone buildings were constructed. Part of the breakwater is in ruins and part of the construction has sunk into the sea due to the gradual subsidence of the ground level in this part of the Pacific.

There are at least ten passages through the encircling reef into the lagoon. There is a lack of information as to enemy defenses, but the high land lends itself to good defensive positions. The size of the island is sufficient to provide shelter for the garrison which, judging from previously noted Japanese occupations, is probably a reinforced division.

10 to 20 miles westward from Ponape are the Senyavin Islands.

Three hundred and fifty miles southeast of Ponape is Kusaie, another volcanic island, the most easterly of the Carolines. Its area is 50 square miles, with a length of 8 miles and an average width of 6 miles. The maximum altitude is 2,155 feet. There is considerable rough, jungle territory. The encircling reef is close to shore, with no anchorage behind it except at the harbors.

The main harbor is small and its entrance is narrow. Located on the northeast side, it is covered by the fortified islet of Lele (Rere on some maps). Minor harbors of little military value are on the south and west sides. Kusaie is an advance Japanese air base; it is not a naval base.

The prehistoric race inhabited this island also. It left some massive stone construction.

Halfway between Ponape and Kusaie, at a distance of 175 miles from each, is Pingelap.

In the eastern Carolines the prevailing weather is the northeast trade wind. Military operations are practicable at any season of the year. In the western Carolines the northeast trade wind blows only from November to April. It is then replaced by the southwest monsoon, which often blows in strong gusts resulting in heavy surfs on beaches. In the same region typhoons may occur after the middle of July until the first of December. These violent storms are a decided menace to amphibious expeditions.

#### THE MARIANAS

Also known as the Mariannes or Ladrone Islands, these consist of 15 small islands having an aggregate area of about 250 square miles. They extend in a nearly north-south line between North Latitudes 12° and 21°. The most southerly of the group is Guam, well known to Americans. All islands are volcanic and highly fertile. They lie on the boundary between the northeast trade winds and the southwest monsoon; as a result rain is general at all seasons, and typhoons are frequent from August to November.

The most important islands are the five southerly ones. Guam is the largest, being some 30 miles long and 6 miles wide. Its highest elevation is 1,334 feet. The main harbor was Apra, which was small and had a narrow entrance. A new harbor has been constructed at Agaña. Both ports are on the west coast.

Forty-six miles to the northeast is Rota, a small island visible from Guam in clear weather. A hundred miles from Guam is Tinian, with Saipan adjoining it 3 miles further north. These two islands are the main Japanese base in the Marianas. Large numbers of Japanese have settled there. Sugar production on a large scale has been established, as the soil is particularly suited to this crop. To protect the sugar plants from certain destructive insects flies were introduced by the Department of Agriculture. They eat the larvae of the undesirable insects. The flies have in turn become a pest, but are protected by local regulations against fly swatters, etc.

Saipan has a maximum altitude of 1,500 feet, Tinian 560 feet. The usual coral reefs surround both islands and are close to shore. The main Japanese establishments are on Saipan. This island is 13 miles long and averages about 3 miles in width. The main harbor, suitable for only a restricted number of ships, is Tanapag, on the west coast. These two islands are good air bases but they are not naval bases.

The south group of 5 islands is completed by Aguijan, just south of Tinian, and last reported as uninhabited.

The north group of ten islands is less important. It is mostly uninhabited. On four of the ten are six volcanoes, all recently active. They are the only volcanoes on the active list within the Japanese Mandated Islands. Starting at the south they are

Alamagan	2,440	feet	
Pagan	1,883	"	3 active volcanoes on this island
Asuncion	2,923	"	Assumption on some maps
Uracas	1,047	"	

On account of volcanic activity earthquakes are frequent on all islands. As construction is of light material, damage is usually minor.

The prehistoric race previously mentioned has left massive rows of decorative columns on Tinian, and stone houses on Saipan. Otherwise all construction is recent.

Japanese military installations are known to have been established on Tinian and Saipan for some time. There is no positive information on other islands. However, it should be presumed that Guam has been fortified. As air bases the islands are of considerable importance: Saipan is about 1,500 miles south of Yokohama, 680 miles from Truk, 950 miles from the Palau Islands.

The Marianas are an advance post for the defense of the main Japanese islands from the south and for the Philippines, which lie 1,500 miles to the west. They cover Formosa and the central China coast. It must be expected that the Japanese will vigorously defend this group of islands.

#### THE MARSHALL ISLANDS

These are the most easterly of the Mandated Islands. In contrast to the Carolines and Marianas, the Marshall Islands did not previously belong to Spain. The Germans first appeared in 1878, and formally annexed the island group by treaties with native chieftains during 1885 and 1886. The Japanese entered the islands during 1914 and 1915.

The Marshalls are all coral islands. They are arranged in two parallel chains extending about northwest and southeast and averaging about 150 miles apart. The eastern chain (known as the Radak) contains 16 atolls, the western (or Ralik Chain) has 18. Each chain is nearly 400 miles long.

At the north end of the Ralik Chain is the atoll of Eniwetok, now in American possession. Eniwetok is elliptical in shape, with a major axis of 30 miles and minor of 21 miles. Its main islet is Eniwetok, at the south end. It is about 3 miles long and a mile wide, and is considerably larger than half a dozen other islets. Due to its position Eniwetok has considerable importance. It is farther west and farther north than any other island in the Marshalls; consequently it affords best possibilities for air reconnaissance in these directions. The air distance to Wake is 575 miles (NE), to Ponape 365 miles (SW), to Truk 775 miles (WSW).

The next important atoll in the chain is Kwajalein, also in American possession. 200 miles from Eniwetok, this is the largest atoll in the group. It is 80 miles long and in the center 20 miles wide, tapering off at the ends. There are two groups of islets, one each at the north and south ends and each containing airfields. Numerous entrances to the interior lagoon make it practicable to assemble large numbers of ships and load and unload them from dumps and stocks on shore. The disadvantage is that due to the narrow width and low elevation of the islets, which prevent good camouflage and underground construction, bombing might cause considerable damage; this danger will disappear as the enemy is pushed westward.

Kwajalein is 2,300 miles from Pearl Harbor or Honolulu. This atoll is very suitable for an advance air and naval base and as a supply center. A large amount of coral is immediately available for air runways.

At the south end of the Ralik Chain is Jaluit, the administrative center and main trading post of the Marshalls. At date of writing it is still held by the enemy. The atoll is 40 miles long with a width not exceeding 25 miles. This is a Japanese advance sea and air base. Main establishments are on the islets of Jaluit (at the south end) and at Emidj (4 miles to the north on the east side). Like most atoll islets, these average not over a mile wide. Jaluit is 12 miles long, in the form of a hook, the east leg being 10 miles and the west 2. The main passage into the lagoon passes between Jaluit and Emidj. There are about 23 other islets which are inhabited but without notable importance.

130 miles east of Jaluit is Mili, next to the southernmost of the Radak Chain. This atoll of over 50 islets is about 23 miles long and 12 miles wide. It is an enemy base, being the furthest east and furthest south in the Marshalls. It is the closest to the American-held Howland and Baker Islands, and Phoenix Islands. The main islet is Mili, at the southwest corner. Entrance to the lagoon is on the north side.

75 miles to the northwest is Majuro, about 35 miles from west to east and 10 from north to south. This atoll, which does not appear to have had any enemy defenses, has been occupied by American forces. The main islet is 30 miles long and less than a mile wide. There are many reefs in the west half of the lagoon.

At about the center of the Radak Chain is Maloelap. It is nearly opposite Kwajalein, which is 225 miles distant. This is another enemy base. There are about 60 islets about a lagoon 32 miles long and 12 wide. The main entrance is on the south side.

Ninety miles to the northwest from Maloelap is Wotje, an atoll of parallelogram form 32 miles from east to west and 10 to 12 miles from north to south. This is another enemy base. The islets of Wotje and Ormed, at the two east angles of the parallelogram, are the centers of enemy installations. 13 other islets have inhabitants. Main entrance to the lagoon, which has many reefs, is on the south side. Both the main islets are under two miles long and a mile wide; they would be readily covered by gun fire and bombing.

Sixty miles northwest of Wotje is Likiep. No enemy has been reported on the islets of this atoll. It is noted for its height, there being a sand dune with an elevation of 33 feet, which is a record for a coral island.

The other atolls of the Marshalls have nothing special to note.

The total area of the Marshalls is estimated as 160 square miles. Their climate is equable and without storms. Military operations can be conducted at any season. Although in the northern hemisphere, their warmest month is January and the coolest, July.

The reefs which forms the boundaries of the atolls seldom exceed 600 feet in width. Depths of lagoons are usually under 150 feet, affording good anchorages.

Main Japanese establishments have been in the Radak (east) Chain. These afford the enemy his best opportunity for scouting toward the Hawaiian Islands and the Equatorial Islands held by the Allies. The Ralik (west) is more important to the Americans, as these afford bases closer to other possible objectives than would the Radak Chain.

# More On Being a Safety Officer • By Lt. Jerome S. McIntee, FA

At the outset, I wish to make it clear that I agree with Lt. S. C. Myer's statement in the February issue of this JOURNAL that a Safety Officer has the meanest job in a battery! I also agree heartily with the balance of his article but believe I can add a little useful and practical information concerning the work.

While acting as a Safety Officer, one can never be too careful. Concentration is all-important. The tackling of any other job at the same time must not be considered. The Safety Officer's primary and *only* duty is to carry out service practice firing without any breaking of safety rules. Should a mistake of any sort occur, it immediately becomes his sole responsibility—the error is his and his alone—and he quickly learns that he "hasn't a friend in the world!"

Duties of a Safety Officer are governed by three things: (1) *AR 750-10*, while in actual service practice; (2) *AR 45-30*, in case of accident; and (3) *Post Firing Memorandums* which are put out by the Range Officer with the consent of the Commanding Officer at the posts where artillery firing is permitted. They are not all alike and so require careful reading and checking.

Lt. Myer's method of figuring safety limits is quite satisfactory and is in common usage. I prefer, however, the method of zeroing the sight along the tube after the piece has been laid properly, and giving the gunner deflection readings for his right and left limits. In this instance, since the sight is used as a "compass," the RALS rule is used. For example, if a right limit of 400 mils and a left limit of 200 mils are allowed, the deflection readings as given to the gunner would be "Right 400. Set out right safety stakes" and "Left 3000. Set out left safety stakes." The latter is figured (3200 — 200 = 3000).

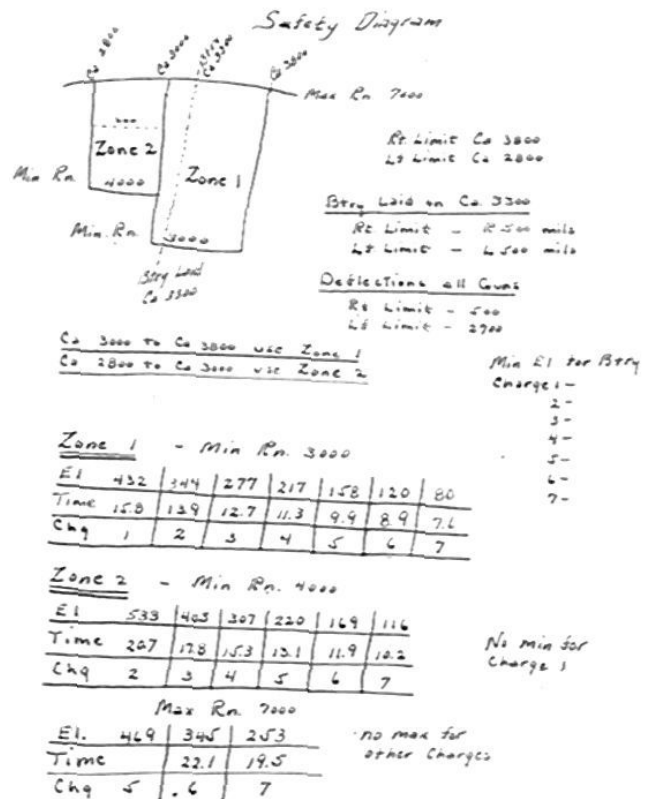
If the method is used of figuring the deflection for the safety limits from the deflection on the gun, the LARS rule is used because the sight is being used in its normal manner.

Checking of *all* work done by the executive in laying the battery cannot be stressed enough. "To err is human," and even though an officer may be a fine executive he can still make mistakes. Nothing reassures or makes a Safety Officer feel better than to know that he has checked everything himself and found it correct, and that he has also complied with AR at the same time. The duty of the Safety Officer is absolutely clear when it comes to checking another man's work, as he is the sole responsible officer when any kind of safety violation occurs. Besides, if he has done everything correctly and then not checked the laying of the battery and it is incorrect, all his work is worth nothing so far as lateral limits are concerned.

The accompanying diagram is offered only as a suggestion in the making of a firing chart by a Safety Officer. No attempt has been made to draw up a safety card as their form varies at the various posts. Any safety card, however, will have the information listed below, and the diagram is made up from this information.

## SAFETY CARD

- Right Limit Compass 3800
- Left Limit Compass 2800
- Maximum Range—7000 yds.
- Minimum Range, Compass 2800 to Compass 3000 — 4000 yds.
- Minimum Range, Compass 3000 to Compass 3800 — 3000 yds.



By keeping a score or tab sheet on deflections the Safety Officer can tell in a moment where he stands with regard to safety limits. All the necessary information regarding time settings and charges he can take directly from the Firing Tables or a GFT; either one will give the correct data. With the diagram the Safety Officer has set up visually the safety limits that have been given to him on the safety card.

Now he has the job of figuring the minimum elevations for the battery. This is done by taking the highest elevation read to the Safety Officer by the gunners of the four pieces, figuring 5 yards converted to mils at piece-mask range (use formula  $\frac{Y}{R} = w/R$ ), adding two forks, determining the elevation to the piece-mask range for the charge—and adding all four items together. This will give him the minimum elevation for whichever charge for which he has looked up the piece-mask elevation. As this is only one minimum elevation, the Safety Officer must also figure them for all other charges. If the minimum battery elevation for *each* charge is lower than the safety limits on elevations given on the safety card he may disregard his minimum elevations and use his safety diagram. If the minimum battery elevations are higher than the minimum elevations set forth by the safety card they must be taken into consideration and noted on the safety diagram as shown.

The difference between the method I describe and that set forth by Lt. Myers is that he can check his safety limits from the deflection on the pieces whereas my method requires keeping track of deflection shifts. This requires a little more work on the Safety Officer's part but does make it easier for the gunners and Safety Officer to set out safety stakes initially,

when compass laying is used. When deflections from an aiming point are given without regard to compass, Lt. Myer's method is easier for both Safety Officer and gunners. The answer to which is the better method rests with the Safety Officer himself: he should use the method he knows and likes the better and which he feels makes it easier for him to do his job well.

If you are detailed to be a Safety Officer be careful, alert,

and above all things *accurate in your work*. If you figure your minimum elevations and they come out in tenths, take them to the next higher mil and add the tenths of a second onto the time reading corresponding to the elevation. If you are figuring your maximum elevation and they come out in tenths, take them to the next lower mil and subtract time accordingly. If you do this your elevation limits will never cause you any trouble.

## BASIC POINTERS ON TIMEPIECES

Republished from "The Ordnance Sergeant"

Regardless of their nature, timepieces are delicate precision instruments requiring the maximum of careful handling. In the military service particularly, watches are subjected to adverse conditions far exceeding anything met in ordinary use. A watch seldom wears out—rather, the rough usage and conditions to which it is exposed usually renders it unserviceable. The number of repairs made in normal field maintenance could be reduced materially by a basic knowledge of the principles involved in properly caring for these instruments.

The general doctrine on watch handling could be called the preventive maintenance of Ordnance timepieces. If the repairman will supply the users of timepieces with this information, he will find himself with much less to do.

### WATCH HANDLING

It is well known that a fall or severe jar is liable to injure the mechanism of a watch, usually bending a pivot or breaking a jewel. Perhaps it is not common knowledge that the mere fall of a watch to the end of its chain or the jar it may receive when the article of clothing it is in is thrown down or dropped may damage some part of the movement. Therefore all sudden motions of a watch, even when in the hands, should be avoided.

Try to keep the parts of a watch from becoming magnetized, by avoiding electrical apparatus having strong magnetic fields (such as large motors and generators).

Keep the watch free from dirt and lint. This can partially be accomplished by keeping the watch pocket clean or making a small pocket for the watch out of a material that gives off a minimum of lint. Watch cases should never be opened except by qualified Ordnance personnel, and broken crystals should be replaced promptly to prevent dirt or fragments of glass from entering the fine mechanism.

### CARRYING WATCHES

*Pockets.*—The location and size of pockets as well as the kind of chain or fob used has a more important effect upon the uniform running rate of a watch than is generally realized. Then too, the temperature and amount of motion or jar of a watch varies with different pockets. For example, a watch carried in an upper pocket generally has a lower temperature, is more frequently disturbed, and is in various peculiar positions more often than a watch carried in other pockets.

*Fobs or Chains.*—Unless some method is adopted to hold it upright, a watch carried in a large pocket will have an irregular rate because of constantly being turned to the right or left. A fob or chain that hangs over the top of a pocket holds a watch upright quite well, but then there is the possibility of the watch dropping or being pulled out of the pocket unless some safety precaution is used.

### WATCH WINDING

Regular and full winding is a "must" function if a watch is to keep accurate time. Most watches are designed for winding once each day, and the delay of even an hour in the time of winding may cause considerable variation in the rate. The conclusion of the winding operation should be approached slowly to avoid injury to the spring or winding mechanism. However, a watch must be wound fully to insure its keeping correct time.

### TIMEKEEPING OF WATCHES

A daily comparison of one's watch with a reliable regulator, chronometer, or time signal received from an authentic source is a valuable aid in determining if a watch's rate is regular. Any marked departure from a regular rate usually means that the watch has been damaged or needs cleaning or oiling. Repairs and adjustments should be made promptly before further damage or wear results from the friction or wear from bent or worn parts. Small errors in the rate may be taken care of by regulating.

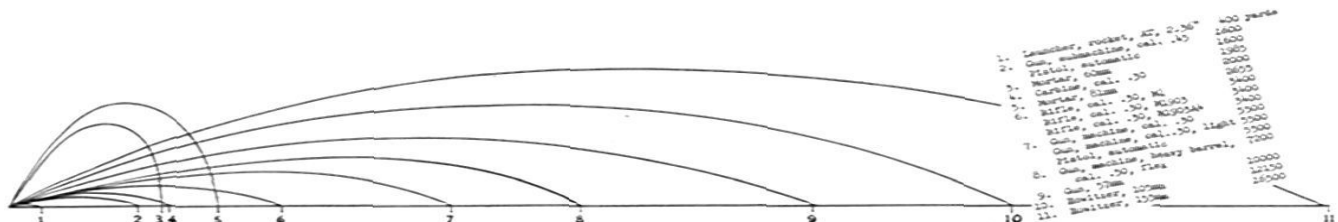
Regulating a watch is done *only* by qualified Ordnance personnel.

When variations of the daily rate gradually become greater, the progressive change in rate becomes more pronounced, and the watch runs erratically, it is a reliable indication that the watch needs cleaning. The frequency of cleaning varies greatly and depends largely upon the usage the watch has received, such as exposure to air, dirt, fumes, moisture, or temperature changes.

### WATER AND DAMPNESS

Moisture and dampness are the worst enemies of service timepieces. When a watch becomes wet or any suspicion exists that water may have seeped into the movement, it should be dried out in the best manner possible and immediately returned to the nearest Ordnance unit for cleaning. Any delay in having the watch serviced will give the water an opportunity to rust the steel pinions and wheels, thus rendering the watch entirely unserviceable. The using unit must never attempt to clean, oil, or disassemble a service timepiece.

## RANGE OF WEAPONS IN THE INFANTRY DIVISION



—The Ordnance Sergeant



## *Know Your Enemies' Weapons*

### **German 15-cm (5.9") Howitzers**

By Lt. Col. G. B. Jarrett, Ord.

In 1918 approximately 50% of the German Foot Artillery Regiments were equipped with a 15-cm Heavy Field Howitzer; the remainder were equipped with 21-cm (8") howitzers. At that time four 15-cm types were in use. The existence of such a wide variety was due to heavy wartime needs and to the making of those improvements that could be quickly produced. The Germans termed each of these weapons a heavy field howitzer (Schwere feld Haubitze).

Pattern 1 was called an s.F.H. Velocity was very low and range was short. It fired a shell of about 92 lbs. This appears to be the original German 15-cm Howitzer. Designed prior to 1900, it had no conventional recoil system: the recoil effect of the entire piece was partially checked by a system of brakes on the tires, in addition to a flatwire rope which wound around the inner flanges of the wheel hub. This piece required much relaying when in action. For poor ground conditions, special wicker mats were provided from which to fire the howitzer.

Pattern 2, a much improved version, appeared in 1902. (It will be remembered that in 1896 the Krupp 77-mm. F. G. had been introduced and with it a very good recoil system.) This new 15-cm howitzer was known as 15-cm s.F.H. '02. Its carriage had a modified box trail and spade. A constant recoil system was provided. As with the earlier model, this howitzer was not shielded.

The '02 Howitzer had a single motion sliding wedge breechblock, with an axial striker. It was fitted with axial sight, although no independent line of sight.

Just prior to the outbreak of W. W. I the Germans introduced as Pattern 3 an entirely new howitzer design. In the '02 model the range had been increased over the earlier type by almost a mile. In this new 1913 weapon there was again as much range increase by comparison with the '02 as between the '02 and the original pattern when using standard ammunition. However, a new 15-cm shell was then on the drawing board. It was something of an innovation, a partially streamlined projectile. The shell was with windshield, but not boat-tailed. This shell, when fired, added an additional 1,500 yards to the 1913 howitzer, of course using the super-charge.

In 1915 a 3-caliber lengthening of this s.F.H. 13 tube was put into production. This, the 4th Pattern, was termed lg.s.F.H. 13. Again the range was improved with standard ammunition, and the new streamlined shell could be shot a still greater distance.

The 1913 howitzer was a very steady, and therefore accurate, piece. During W. W. I it was without question the backbone of the German artillery regiments. The use of substitute weapons for the lg.s.F.H. 13 in the German Army at that time was only endured because of attrition and the ever-increasing need for more artillery in support of the lines at the front.

Overall, the lg.s.F.H. 13 was rather long. Its cradle was



*15-cm s.F.H. '02 in Russia in 1915*

provided with rear trunnions, air recuperator, and constant recoil. Its axle supported a top carriage and this top section mounted the cradle. Trunnions were vertically above the carriage axle. Balance springs equilibrated the piece. Maximum recoil was approximately 59" (8th Zone).

The tube was 17 calibers long with a shrunk-on muzzle, two guide rings, and a heavy breech jacket. The breech was a sliding wedge.

The top carriage was pivoted in front of the carriage axle on the carriage proper, which was remarkable for the length of the trail; this had a hinged spade—a novelty at that time; the spade was hinged on an eccentric and could be clamped both when folded up and when let down. On the hinged shield the usual central shutter was replaced by a hood. The entire carriage was mounted on 49" wooden wheels fitted with 4½" steel tires.

Sights were mounted on an oscillating bracket, and were canted to allow for drift. The range drum was graduated in hundreds of meters for the 8 charges, and also in degrees from 9° to 42°. Later we shall return to the lg.s.F.H. 13 to see how it has done its bit once again in the present war.

Since W. W. I the German artillery designers have unceasingly sought to add range and mobility to their pieces, just as have the similar design branches of most other countries. During the early '30s a new German 15-cm piece made its appearance, one developed to meet the requirements of the new warfar which within a few years was to scourge Europe and eventually all the world. This new 15-cm howitzer is the backbone of the present German artillery; it is known as the S.F.H. 18. General characteristics appear in the table herewith. The increase in weight of the piece over its predecessors is within reason when the increased range and field of fire are considered.

This is a split trail piece. In retrospect, the elevation obtained by the four earlier 15-cm versions is of interest. By comparison, the original s.F.H. could be elevated almost half again as much as the s.F.H. '02. Both of these early pieces had a conventional box trail. The two s.F.H. 13 patterns had identical carriages, with modified box trails. Actually, they realized the same elevation as the present S.F.H. 18.

Throughout all of the earlier versions the traverse limits did not exceed 4°, whereas in the 18 model up to 60° is provided. The excellent field of fire of the S.F.H. 18 is easily understood. Its great increase in range becomes clear when one

# lg.s.F.H. 13



Photos taken during training for this war show considerable detail. With most German artillery horse-drawn, we see 6 cannoneers riding back-to-back on the limber of a howitzer.



In action near Amiens, in 1918



The Germans use prolonges more than we do, in getting their pieces into position.



Emplacing the howitzer: modified box trail is well elevated for swinging, and then for embedding the hinged spade as much as possible.



Reloading preliminaries: man at right has the charge in its short brass case, the next one carries a 1914 pattern short shell.



← New life was infused into this piece by mounting it on the French Lorraine tank chassis. This one was captured in the desert just before the Alamein battle.

Breech, sight mount, and traversing hand-wheel are clearly seen here, precisely the same as on the old ground mount. →



considers that in this piece the full charge weighs 8.17 lbs., nearly 3 times the weight of the charge of the old s.F.H. 13.

In 1933 Hitler reaped the benefit of the labors of these never sleeping designers, and had this S.F.H. 18 as a well proven piece to back up the army campaigns he was then planning. The S.F.H. 18 is quite mobile; it is towed by a very capable, gas-powered half-track. Under average terrain conditions the unit can be gotten in or out of action in a minimum amount of time.

#### AMMUNITION

To appreciate the earlier patterns of German heavy field howitzers, in terms of the newer piece, some description of the ammunition might be in order.

In W. W. I the German designers were among the first to experiment with several types of shell and, concurrently with the French, pioneered in streamlining. Now of course most artillery shells are streamlined.

In 1912 a special shell, much longer than conventional designs of the time, was adopted for the 15-cm s.F.H. '02. It was called the 1912 or 1912 n/a\* H. E. This shell was quite satisfactory, and also proved adequate when later used in the s.F.H. 13. This was a steel shell with flat base weighing about 95 lbs., and was shipped in a wicker basket.

In 1914 a shorter yet similar steel shell was developed weighing somewhat less. In the later days of W. W. I this was the type most used. Being lighter, some advantage in range was gained without undue sacrifice of accuracy. In 1918 the range of this same round was slightly improved by a modification which added a windshield, yet without causing much weight increase. Undoubtedly much of the range advantage gained was lost in accuracy, as so many of the artillery tubes of the German regiments were badly worn at the time. It should not be overlooked, however, that the solving of many W. W. I problems for this caliber, during 1918, was making data available from which came the present day S.F.H. 18, a very excellent weapon.

Another interesting 15-cm shell of W. W. I, as an ersatz expedient, was a cast iron version of the shorter 1914 pattern.

\*Neuer artillerie

Leaving the exterior the same, the designers cast it of iron, thickening the walls to offset otherwise poor fragmentation. The bursting charge obviously was reduced about a third.

At the time, several other shells also existed which were chemically filled. Gas, smoke, and incendiary fillings were identified in several forms before the Armistice of 1918. Because of the greater capacity most gas shells were of the long 1912 pattern, with an elongated burster to scatter the chemical filler.

A noteworthy addition in 1918 was the use of a smoke-producing agent in a fair percentage of all types of these 15-cm HE shells. Usually it was found as a small cardboard tube of red phosphorus placed in the bottom of the cavity, with the charge pressed or cast around it.

Fuzes for the above-mentioned 1st W. W. shells were basically in three groups: (1) a double acting fuze—time and percussion (short- and long-delay feature provided); (2) a straight nose percussion fuze; (3) a new (at that time) design of instantaneous fuze. All these percussion fuzes were noted for either no safety device or one of a most unreliable design.

Propelling charges for all these howitzers were in flake form, packed for zones in bags, and with all increments in a brass or steel case. The original powder was double base but in the later days of W. W. I a substitute for the glycerine was used.

The worn-out German gun tubes of 1918, plus ersatz powders with a varying potential, must have caused much inaccuracy. Indubitably, it is happening again at this time with the German artillery.

#### PRESENT MODEL

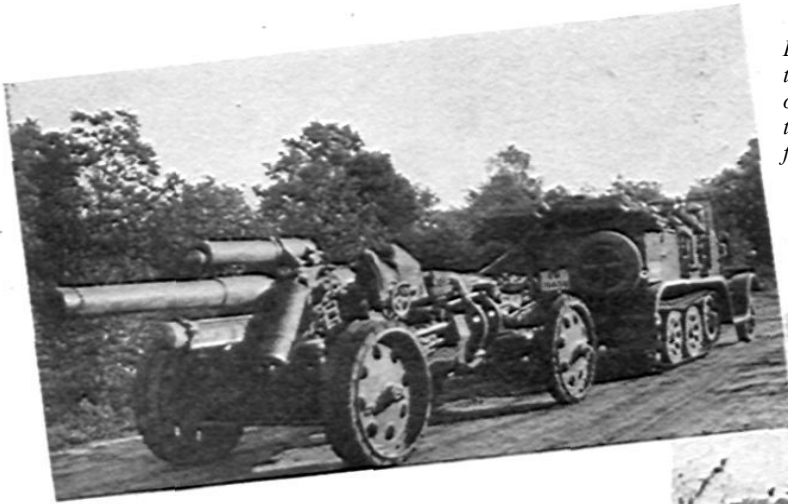
The present version, or S.F.H. 18, has a carriage employing modern design features, especially a split trail. A desirable element is that this same carriage can be used for the 10-cm K18 or Gun. The recoil system is adaptable to whichever tube is used. This same principle is followed with our 155-mm Gun and 8" Howitzer on the same carriage.

In 1941, with the conditions of armored warfare becoming more involved, the Germans took a page out of French development (first done in 1918) and began to mount artillery on a tank chassis. One of the earliest German attempts was

	ORIGINAL PATTERN (s.F.H.)	1902 Pattern (s.F.H. '02)	1913 Pattern (s.F.H. 13)	Long 1913 Pattern (lg.s.F.H. 13)	Current Pattern (S.F.H. 18)
Caliber	14.97cm (5.89")	14.97cm (5.89")	14.97cm (5.89")	14.97cm (5.89")	15cm
Rifling (grooves)	36	36	36	32	40
Length of howitzer	10.8 cal.	12 cal.	14 cal.	17 cal.	
Wt. of howitzer w/breech block	21¼ cwt.	15¾ cwt.	15½ cwt.	16¼ cwt.	
Wt. of carriage	19 cwt.	23½ cwt.	26¾ cwt.	26¾ cwt.	
Wt. limbered up w/o gunners	53½ cwt.	53½ cwt.	?	?	7.7 tons
Limit of elevation	65°	42°	45°	45°	45° (trails open)
Amount of traverse	?	3°56'	about 4°	about 4°	60° (trails open) 6° (trails closed)
No. of charges	7	6	7	8	8
Wt. of full charge	1.9 lbs.	2.6 lbs.	3.0 lbs.	?	8.17 lbs. (130.64 oz.)
Muzzle velocity w/full chge.	905 f/s	1,066 f/s	1,196 f/s	?	
Max. range w/full charge	6,616 yds.	8,147 yds.	9,296 yds.	9,296 yds.	14,522 yds.
Wt. (firing position)					6.2 tons
Wt. of shell, 15-cm Gr. 19					95.7 lbs.
Muzzle velocity, Charge 8					1,706 f/s
Max. range, Charge 8 (Gr. 19)					14,572 yds.

# S.F.H. 18

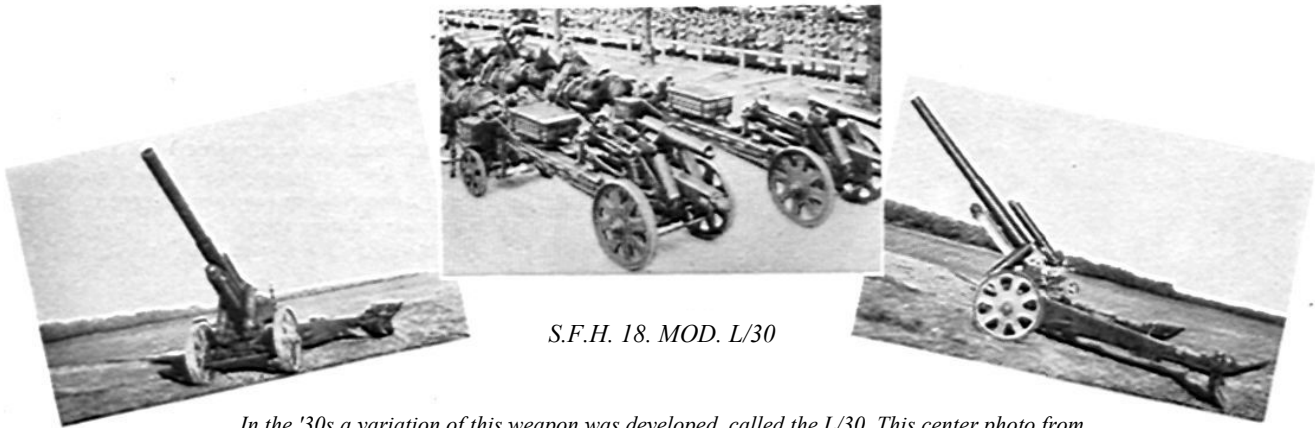
Left: being towed by the standard 8-ton (towed load) half-track. Below: this is a position on the Russian front; absence of camouflage or concealment suggests that this photo was taken during the fall of 1941, while the Germans were in the first flush of success there.



Below: details are quite clear in this picture from Libya. Below, right: disorders in Milan provoked a strong German response against their one-time allies!



Above: when this weapon is mounted on a PzKw chassis (a la our M12 GPF mount) no spade is used, at least according to this photo from the Russian front. Left: here we see it during the campaigns in Greece. Note the wicker baskets for transporting the shells, and the wooden boxes for pairs of propelling charges in their brass cases. Also note the extraordinary congestion around this mountainside position!



S.F.H. 18. MOD. L/30

*In the '30s a variation of this weapon was developed, called the L/30. This center photo from a Berlin demonstration before '39 shows that the carriages are steel-tired and horse-drawn, and that the tubes are removed for transport on special vehicles. Although not shown here, these are also horse-drawn.*

to utilize existing equipment which was, at the least, obsolescent.

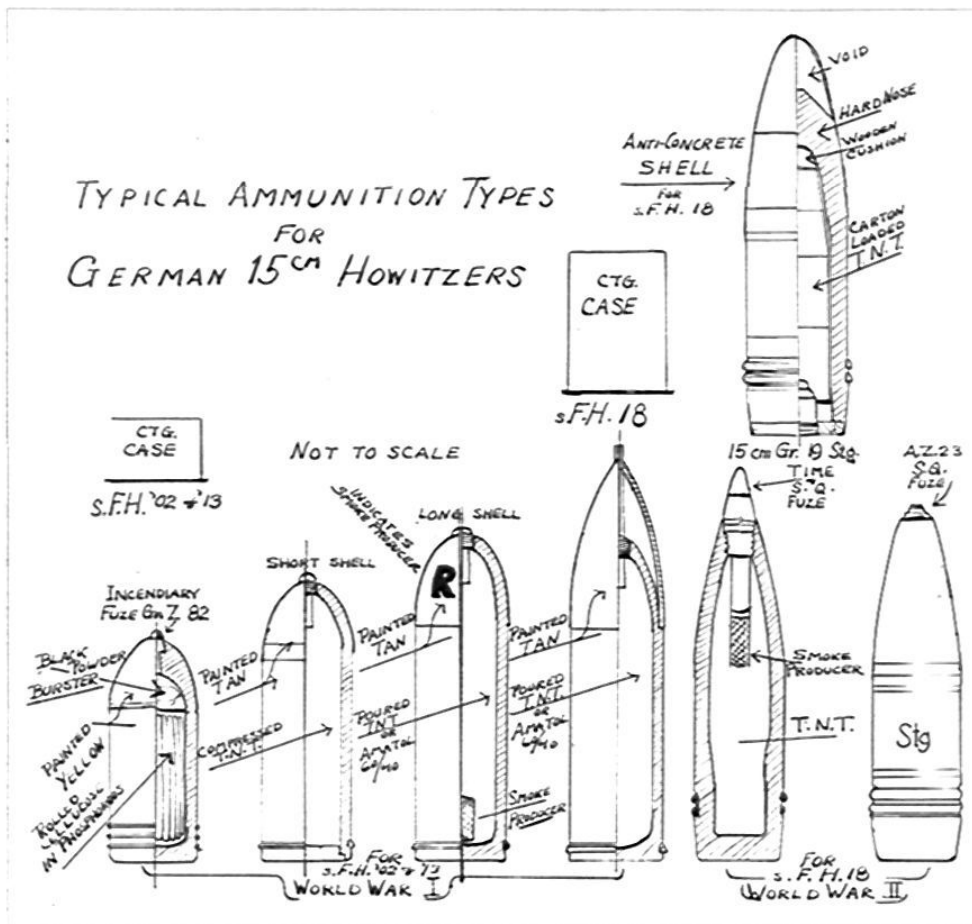
A vast number of French Lorraine tanks were found among the French booty. These were of no use whatever to the Germans as fighting tanks or even as pill boxes along the French coast. A number of the old 15-cm lg.s.F.H. 13 pieces also existed, in the German training schools. These were modified sufficiently to be placed on these French Lorraine tanks. The tanks had their fighting compartment and superstructures removed. After welding the 15-cm carriage to

the hull, a new armored top structure was welded around the whole unit. This gave the crew some protection from enemy shell fragmentation.

One must not forget that the old lg.s.F.H. 13 still fired a dangerous shell as far as the target area was concerned. With this weapon mounted on the tank, all the mobility it lacked on its horse-drawn carriage was now realized, plus 360° traverse obtainable by turning the tank. As highly mobile artillery support to meet the requirements of the armored division, this modification filled the bill. A number of these pieces so

mounted were identified along the Alamein front as early as August, 1942. In the November battle many of them had been destroyed by U. S. M7 105-mm and British 25-pounder fire, or deliberately burned out by the Germans. During this Alamein battle much German equipment either failed mechanically or was caught without fuel and had to be set afire by the retreating crews.

Throughout the Afrika Korps campaigns of 1941-43, the S.F.H. 18 piece continued to be used, always towed by the standard half-track. In the later (1943) German campaigns in Russia, a number of PzKw tanks have been identified on which the S.F.H. 18 is mounted. At last the Germans put their best 15-cm howitzer piece on a tractor gun mount. Very little is known about the efficiency of such a unit in the field. However, it is a very heavy weapon and must create great strain on the PzKw IV chassis, either in transit or when in action. It is assumed that possibly a







*S.I.G. 33, 15-cm heavy infantry howitzer, is NOT a weapon of the type discussed in this article, although in its own way and within its limitations it is a quite effective piece.*

few rounds are carried with the unit and the remainder in a following half-track. It will be noted in the illustrations that the carriage does not have a spade, whereas the lg.s.F.H. 13 on the Lorraine chassis did.

The latest ammunition for the S.F.H. 18 is quite streamlined. HE, chemical (smoke), and anti-concrete are provided. All were with double rotating bands. In the HE shells two designs are found, one of forged steel and the other cast. The anti-concrete shell is base fuze, with instantaneous, short delay, and long delay settings; this shell is a high capacity type and in an emergency can be used with instantaneous setting as an anti-personnel round for exposed targets.

Again the 6-zone charges are issued in the cartridge case—which originally was of brass but now is of steel. Supercharges exist, Zones 7 and 8, and are packed in a separate container. Zone 7 charge includes the other 6 increments, and charge 8 as an extra increment is added if required.

#### ACCURACY OF 15-CM S.F.H. 18

	Range in Meters	M.V. (meters per sec.)	width	50% zone length
Zone I	3,970	210	7m.	42m.
Zone II	4,700	230	7m.	42m.
Zone III	5,450	250	8m.	42m.
Zone IV	6,600	280	9m.	46m.
Zone V	8,200	320	10m.	47m.
Zone VI	9,700	375	11m.	52m.
Zone VII	11,250	435	13m.	61m.
Zone VIII	13,325	520	13m.	63m.

The German Army has another 15-cm howitzer, classed as S.I.G. 33 (Schwehr Inf. Geschutz 33). This fires an 80-lb. high capacity HE shell quite like the 1st W. W. designs and not streamlined. Range is so very short that actually this piece is more like a 15-cm trench mortar on wheels and thus is used only by the Infantry. It should not be confused with any of the field howitzers.

German 15-cm guns do exist, and these too should not be confused with the heavy howitzer 18. They are all very heavy weapons and obviously of fairly long ranges, although not unusually so for the 6" class.

## LIGHT ARTILLERY IN THE PURSUIT

By Lt. Col. I. Malikin

BY RADIO FROM MOSCOW, DIRECT TO THIS JOURNAL

In the Novgorod area mobile units of light artillery took part in our pursuit. Their guns, pulled by tracked trucks, easily moved with our attacking infantry and occupied positions right on the highway or along the roadside, while the prime movers were put under cover. Shells were also brought up in trucks fitted with tracks.

Each battery organized an all-round defense with light machine guns and antitank rifles to support it. When on the march this fire power was detailed on the flanks to protect the column.

The gunners often had to solve complicated problems under these changing conditions of mobile warfare. One unit set out in pursuit of a group of the enemy who had just been dislodged from a village. These batteries moved so fast that they out-paced the infantry. They were met with withering fire when they caught up with the Germans, whereupon they occupied direct fire positions. Their fire apparently was effective. After 30 or 40 minutes artillery scouts, taking advantage of the murk, moved forward and then returned to report the Germans were withdrawing.

Our artillery again set out on the heels of the enemy and caught up with them on the approaches to the northern edge of a village where the Germans again attempted resistance. Flashes gave away the enemy positions and our batteries again opened up. As our infantry had not yet arrived, the gunners had to fight without their assistance.

Our artillery followed the enemy with such speed that he had little time to mine or damage the roads. One big highway bridge remained intact although mines were there for its destruction. At one place where the Germans had succeeded in damaging the road, our men bridged the crater to let the guns get forward. Around another damaged section our soldiers built a detour path. All guns were fitted with prolonges so the artillerymen could haul them across difficult terrain to take up new positions quickly. When there was a suspicion that the roads were mined the gunners did not wait for the sappers but neutralized the mines themselves.

Near Navolok village, which the Germans had prepared for defense, a fierce battle developed. On the flanks machine gunners and tommy gunners, established in houses, conducted heavy fire. An enemy mortar battery was in action incessantly; it must have had an OP with a good view of our movements. The artillery regimental commander ordered a BC, Capt. Nesterov, to silence these mortars. Going up to the attic of one of the houses, after an hour's watch he located the mortar battery, which was sited near the firing line and within the field of our direct fire batteries. The captain pointed out this target to Sgt. Shliapin, who rolled his gun out to an open position and from there conducted direct fire, following the directions of his BC.



# Let's Pass Those Tests!

By Maj. William L. Harr, FA

In AGF artillery tests the same errors are being made constantly and repeatedly, and various combinations of them have been responsible for a great many of the failures. Familiarity with these common errors, and a determination to avoid their pitfalls, can usually prevent them.

Success or failure in these tests is usually determined by the extent of the preparation for them, weeks and months in advance. To insure a reasonable chance of passing them, it is believed the following preparations should be accomplished:

1. As much service practice as the ammunition supply will permit. This is important because observed fires constitute 35 per cent of the final battalion grade.

2. All fire-control equipment should be adjusted, calibrated, and declinated. Also, the instruments on the pieces should be boresighted carefully—and for elevation as well as deflection.

3. The pieces within the battalion should be calibrated—the 4 shooting longest placed in one battery, the 4 shortest in another battery, and the remaining 4 in the third. If ammunition is not available for this purpose, Ordnance can do this for you by means of their "forcing cone test."

4. Then the battalion as a unit must be calibrated. Since in Test 3 you must fire 2 concentrations with metro corrections only, it is essential that you know whether or not your battalion *as a unit* shoots according to the firing tables under standard conditions. If it doesn't, and the chances are it won't, a calibration correction for the battalion must be used when firing with metro corrections only. By means of an accurate survey, very good metro messages, and much ammunition, this can be accomplished. Since normally this is not practical, the next method is to keep a record of all the VE corrections you have determined for your battalion over a period of time and determine the average of the collection. The survey errors and uncorrected weather effects inherent in any single VE correction will tend to cancel out when taking an average of many. This average should be, therefore, a satisfactory calibration correction to use as the "old VE" in Test 3. (Be sure to change the sign when using it as an effect.)

5. High standards of precision must be firmly established in

**Editor's note: AGF tests, like examinations in any school or subject, are not ends in themselves. What is important is that one thoroughly know the points covered by them. Mere learning by rote is not enough; neither are stereotyped or mechanical "solutions." Background, reasons, principles—an understanding of them is the important thing.**

**This is not to belittle these tests, or minimize their importance. They have been carefully devised to disclose the battle efficiency of the units undergoing them. This they successfully do. In studying this and other articles concerning them, bear in mind always that units making a good record in these tests will most certainly maintain a high standard in combat, and that careful training in preparation for them is pointed directly toward success in battle. This, after all, is the sole justification for army examinations of any kind.**

**Maj. Harr is well qualified to discuss this matter: he has undergone AGF tests 5 times (3 times as a battalion S-3), and umpired them as many times.**

the firing batteries. Only by careful and constant supervision and correction can the executive officers accomplish this. All members of the gun squads must appreciate that settings which are "almost correct" are not good enough.

6. Survey personnel must be kept constantly busy with photomap and gridsheet surveys. Here again errors and mistakes must be pointed out and corrected. Methods of checking and cross-checking must be developed. Survey personnel must become adept at locating points by inspection on photomaps and in setting up quickly a target area short base as part of a rapid photomap survey. In stressing the fundamentals of a complete gridsheet survey, reduced distance courses help.

7. The tests should be practiced several times, both with and without firing. This is especially important in giving experience to the FDC, and in speeding up the work of the communication personnel. This practice results in smoothing out the performance of the battalion and in orienting all personnel for their respective parts in the tests.

## TEST ONE

This test, taken by battalion, stresses rapid occupation of position and delivery of observed fires on targets of doubtful location. By the use of 6 OPs, 4 bracket problems, 3 registrations, and 2 battalion concentrations (following the last 2 bracket adjustments) are fired. Usually 2 hours are allowed for the test.

## Common Errors

1. Making battalion order too long. If well planned, 4 minutes should be sufficient.

2. Sending the battalion agent back to the rendezvous for the battalion, instead of using a prearranged radio message.

3. Not dispatching Scout Corporals soon enough, resulting in the stalling of the battalion at the release point.

4. Waiting for wire communication before firing the first 2 bracket problems and the 3 registrations on the base point, when radio can be used for these missions.

5. When the fuzes are percussion only, failing to try to get ricochets with the delay fuze on all missions except the registrations.

6. Failure to materialize an orienting line and to measure base angles following registration.

7. Failure of all batteries to use the same charge for registration, resulting in possible inaccuracies in the observed fire chart. S-3 should specify the charge.

8. No wire vehicles in the parties.

9. Ammunition not properly protected from heat and dirt.

10. Guns laid using sight-extension bars.

11. Failure to determine accurate sites of the batteries for the base point, resulting in inaccuracies in the observed fire chart after stripping inaccurate sites from adjusted quadrant elevations.

12. Unnecessary personnel in the FDC, resulting in too many bosses and much confusion.

## Suggestions

1. In a rapid occupation the battery executives should usually be in the battery parties. This will speed up not only

the occupation, but also the firing of the two targets of opportunity, since the battery commanders can go directly to their OPs instead of having to go to the battery positions first.

2. Occupation is also expedited if the chiefs of howitzer sections can arrive in the positions a few minutes ahead of their pieces.

3. Battalion survey personnel should be in the battalion commander's party to lay an orienting line without delay. Even though it is believed that there are no areas of local magnetic attraction in this vicinity, nevertheless the construction of an observed fire chart from adjusted compass measurements always introduces small errors. Only the adjusted compass of one battery need be plotted, the vertex angles at the base point being determined from differences in the base angles. For orientation of the chart as a whole, and to catch large errors, all batteries should report adjusted compasses as well as base angles.

4. In order to expedite wire communication, it is believed that wire vehicles and personnel should be in all parties.

5. If the batteries are spread abnormally, in the firing of the 2 battalion concentrations (which are based on the adjustment of one battery in each case), the 2 non-adjusting batteries should be laid on the replots of the targets instead of using the normal procedure. This is especially important when the corrections are large. With such large offsets between batteries the corrections for one battery will not work for the other two.

6. Such a mission as the one above, when handled normally, can be speeded up in the FDC by having the computers of the non-adjusting batteries, having laid their batteries on data from the initial plot, listen to the commands of the adjusting computer and determine the corrections themselves. This will save time in that it will eliminate the announcement of the corrections by the computer of the adjusting battery.

7. Usually, the last battery is registered by a battalion forward observer. Since the FDC has the adjusted data from the registration of the other two batteries and knows the approximate distance between batteries, it is in a better position to give this battery accurate commands for the first round than is the observer. By prearrangement, this may be done.

8. By all means keep FDC clear of extraneous personnel.

#### TEST TWO

This test is taken by battalion also. It stresses rapid occupation and quick surprise fire using a photomap as a firing chart. Time shell is used, if available. Following occupation, one battery registers and determines a time correction. After a rapid photomap survey is complete, 4 surprise transfers are fired, using only one battery for each. An air adjustment (using one battery), and the firing of a CI complete the program. This last is a recent addition to the test. Two hours are usually allowed for completion of the test.

#### Common Errors

1. Same errors as in Test One in regard to composition of the parties.

2. Too much survey performed. This is a very prevalent tendency. Everything possible should be located by inspection. Unless needed for vertical control, no connection survey is necessary. Direction is fired in by the registration. Many units have computed base angles from survey, which is not only unnecessary but also too time-consuming for this test.

3. Failure to use the target area short base distance (AS) in photo units. This wastes time and complicates the plotting of the targets.

4. Executive officers not shown their orienting line. This often results in much delay at a critical time.

5. Erroneous "calculation" of a deflection correction. Some battalions have measured the Y-azimuth of the base line of the registering battery from the photomap, compared it with the adjusted compass, and used the difference as the deflection correction. This is a serious error and has failed more than one battalion. Remember that when direction is fired in and base deflection recorded on it, the deflection correction at the chart range to the base point is zero. Deflection corrections for other ranges are drift differences only.

6. Failure to orient the observers for the CI, resulting in lost rounds and wasted time.

7. Failure of the communications officer and the air observer to have a prior conference, resulting in haphazard communications during the air mission.

8. Wasting time and requiring unnecessary work by using a Point B when the base point has been located by inspection. When this can be done no Point B is necessary, since the base point becomes Point B also.

9. Failure of VCO to add 20 yards to difference in altitude between guns and target for time fire, resulting in percussion bursts.

#### Suggestions

1. Be sure the survey officer does not perform too deliberate a survey.

2. As soon as simplex communication with the batteries is established, S-3 should check with the executive officers to find out if they have identified the orienting line. This may save much grief later.

3. S-3 should have someone else check his computation of the base angles for the non-registering batteries, especially if there is more than one orienting line. Any error here can be fatal to the test.

4. While S-3 is waiting for the charts, he can find out from the umpire at the FDC if he is permitted to make out his own fire plan for the 4 transfers. If not, he should try to get one from the umpire. As soon as the plan is made the computers should know all about it. When the charts have arrived, all the batteries laid, and GFTs set up, if S-3 knows that the umpire will not take exception to a little unorthodox procedure he can have HCO and VCO put their data for the 4 missions on 4 slips of paper, one for each mission, and pass them out to the computers according to the fire plan. The battery to fire the first mission should also fire the last; the other batteries, one mission each. Then the batteries can be laid on the first 3 missions simultaneously, *At my command*. One fire direction line should be kept open to the control umpire. When he has been acquainted with the fire plan and his observers are ready, the missions can be fired successively. By the time the third mission has been fired, the battery which fired the first should be ready for the fourth. In my opinion this procedure will reduce chances for error in the FDC, and at the same time execute the missions in a minimum of time.

5. As soon as the survey officer has turned the charts over to the FDC he can take another copy of the photomap and accomplish any additional survey needed for the CI. He can also compute data for orienting the observers and firing the mission. This can be done while the transfers and the air mission are being fired.

6. In connection with this CI, it must be remembered that the data fired by the gun is the adjusted data.

#### TEST THREE

This test is taken by division artillery, brigade, group, or separate battalion, and stresses the amount of preparation and survey necessary in order to fire map data corrected. The first day is devoted to a complete gridsheet survey and preparation and organization of the respective battalion areas for night occupation. A series of overlapping single vertical photos covering both the position and target areas is furnished each battalion. Sometime before midnight each battalion fires 2 concentrations with metro data only, using one battery for each. Sometime before dawn each battalion fires a highburst registration, and from it determines a deflection correction change, a new VE correction, and a time correction. These corrections may now be used to fire the last two concentrations, sometime after daylight.

#### Common Errors

1. Failure to prepare and organize battery positions during daylight, resulting in delay, confusion, and errors in laying after occupation.
2. Failure to dig in battalion CPs during daylight.
3. Failure to locate sufficient points for restitution, both on the chart and on the single verticals.
4. Lack of liaison between the survey and operations sections. This can result in a distracted battalion commander.
5. Dropping one tape-length or one leg in a traverse. At least two recorders in each party must keep independent notes and agree at each station before resuming the traverse. This should prevent this common error, which can prove disastrous.
6. Routes for night occupation not marked, resulting in traffic jams and lost sections.
7. Failure to orient instruments at the two points of observation before dark, resulting in lost rounds during the highburst and unreliable corrections determined from it.
8. Failure to use a calibration correction as an old VE, when one was needed. This has failed many battalions. Notwithstanding that only the first two concentrations are now fired with metro data, this error can still result in complete loss of effect for these concentrations.
9. Ignoring the fact that occasionally ammunition data cards give a non-standard muzzle velocity, and failure to correct for this, either in the solution of the metro messages or as part of the old VE.

#### Suggestions

1. Complete all foxholes and camouflage during daylight.
2. Dig in the CP tent before dark. For units without this new tent, a tactical, comfortable, and easily controlled installation can be improvised from a large chevron trench at least five feet deep, bows, tarps, and benches from the CP trucks, and electric lights strung in series from one of the trucks.
3. It is very helpful to take the overlapping verticals which are furnished and put them together carefully to form a mosaic. This can serve two purposes.

In the first place, if this were not done two points for restitution for each single vertical of the target area would have to be located both on the grid sheet and on the verticals. This could mean as many as 14 or 16 points to be located. The reason this would be essential is that 2 of targets to be fired upon by each battalion are marked on one single vertical given

to each battalion sometime after dark. This single vertical can be any one of the target area group. Since these 2 targets must be restituted to the grid sheet, 2 restitution points for each single vertical of the target area would be essential. However, with the mosaic as a unit, any single vertical received would have a counterpart as part of the mosaic. Then, only a minimum of 2 points need be located on the chart and on the mosaic.

The second purpose is that while the survey is in progress, the FDC can take the mosaic and, using the photo/ground relationship, locate by polar plotting the entire survey on a grid sheet. Then when the real survey comes in, any gross errors in it can be detected by comparison.

4. By using an arbitrary base angle and representing each piece in turn by an aiming circle, deflections to respective aiming stakes can be determined for each piece during daylight. These deflections can be placed on tags tied to the stakes which mark the positions for each piece. Upon occupation, each gunner sets off this deflection and lays on his aiming stakes. Then when the real base angle is received, the difference between it and the arbitrary base angle can be given as a shift and base deflection recorded. I have seen this work many times and with less error, I believe, than would result from laying the battery in the dark. This is not practical for heavy artillery, however.

5. Be sure observers orient their instruments before dark.

6. All computers can solve all metro messages, and then compare them for accuracy. This should not have to be done by an officer.

7. In order to minimize the chances for lost rounds in the highburst, metro data can be used to shoot it. This will insure coming as close as possible to the point for which the instruments have been oriented. In any case, no matter how it is obtained, the data fired by the gun is the adjusted data.

8. When the highburst point is finally plotted, the difference between the chart elevation for it, corrected by the latest metro, and the true adjusted elevation (quadrant elevation fired less computed site) give the mils from which to compute the new VE correction.

9. In applying the new VE correction to the last 2 missions, be sure to determine the metro elevations for these targets from the last metro message, and then to correct these elevations by the number of mils resulting from the new VE correction at the chart ranges to the targets. If the K-change is authorized, set up the GFT with the latest metro effects and add the K-change graphically, to obtain the final GFT setting to be used for the last 2 missions.

#### SUNDRY

Weighting of the tests to determine the final battalion grade has recently been changed to the following:

	<i>Maximum grade</i>		<i>Factor</i>	<i>Total</i>
Test I	100	×	5	500
Test II	100	×	2.5	250
Test III	100	×	2.5	250

Maximum battalion grade — 1000

The trend is to use time shell where appropriate. Test I can be conducted with either ricochet or time shell. Time shell is certainly appropriate for Test II. The first 2 concentrations in Test III might as well be percussion fire, since no time correction is available at that stage; the last 2 concentrations can be fired with time shell, using the time correction determined from the high burst registration.

# THE ADVANCE

By Capt. W. R. Young, M.C., R.A.

From the "Journal" of the R.U.S.I., with whose permission it is republished.

He who with inferior forces advances against his foe is a rash General. In considering the tactics of the advance we must, then, assume that the assailant's strength is greater than that of the defender. For that, after all, is the assumption which the General has made.

The defender will be permitted in this article to produce any kind of opposition except absolutely superior forces.

An advancing column can always be held up by an inferior force, since the head of a column is narrow and the head alone will be inferior in strength to the defenders opposing it. This means undue casualties, and probably a shaking of confidence which will affect the whole rate of advance. It will at least mean delay till the units in rear can deploy.

The complete answer to this problem is to advance fully deployed and to use the superior numbers to envelop the defenders. But such an advance in line has its own dangers, since an active enemy may concentrate at a selected point, pierce the thin line and play havoc with communications.

An advance line, moreover, is not a practical proposition in ordinary country; so we compromise by saying that the advance must be made on as wide a front as possible. We must perforce move mainly along roads, but we must use many roads.

By using several parallel roads for the advance of our columns:

- (a) we compel the enemy to disperse his forces;
- (b) we shorten our columns and so make deployment, when it becomes necessary, more rapid;
- (c) we force the enemy to make wide detours if he wishes to attack our flanks;
- (d) we are always disposed for defense in depth against such attacks; and
- (e) the advance of the whole of our forces is more speedy.

Nevertheless, it is sometimes argued that it is better to use only a proportion of the available roads since that will facilitate: (i) diversions of traffic, (ii) altering the order of march, and (iii) deployment.

Let us examine these claims.

## (i) *Diversions*

Suppose that of four roads A, B, C and D we decide to use A and C. If presently we find our progress on A and C blocked we can divert our columns on to B and D. But we can do this even if we started by using all four roads. The columns on B and D will have moved forward unchecked and the diverted columns can follow on behind them. We will then be in the formation recommended by the "diversionists." But by adopting it late we shall have gained a lot of time and be deeper into the enemy's country. And anyway, why jump our fences before we come to them? It is possible that only one of our roads or even that none of them will be seriously blocked.

## (ii) *Altering the order of march*

This may be rendered necessary by a change in the situation. (Here again we are jumping our fences too early.) But it is rarely impossible for a unit in rear to pass up in front of a



*A 4 or 5 man crew (2 drivers, 1 or 2 gunners, and car commander) runs this 10-ton German armored car. The vehicle has dual steering control (fore and aft) and 8-wheel drive; 17½' long, 8' wide, and 9' high, it weighs 9 to 10 tons. Its turret revolves. Armament includes a light and a heavy machine gun. Notice how the body's armor plate is sloped to make bullets tend to ricochet instead of penetrate.*

forward unit which is halted on or parked off the road. It is far more likely that we shall fail to find lateral roads conveniently placed for our transposition plans.

## (iii) *Deployment*

Infantry can deploy across country; artillery of all types deploys by coming into action in the nearest field. This leaves the machine-gun trucks, the R.E. transport and possibly army tanks to be passed up the road. But there will now be nothing in front of them. We conclude then, as we started, by stating that the advance must be on as wide a front as possible. And we shall use all the available roads.

The motorist knows that by sticking to the main roads he will get along quicker than if he takes a short cut by country lanes. The motorized soldier must guard against this main road mentality.

If there are few main roads available for his advance, the General must have no hesitation in using minor roads or even tracks. No fears of map-reading difficulty or complications of control will excuse him from his primary responsibility, which is to send his forces forward in the best fighting formation. His subordinate who is heading the column on the minor road may be relied on to produce his troops in the right place and, since he will know the General's intention, he will not be in need of frequent orders while on the march. (His wireless will be functioning, anyway.)

Moreover, the minor roads and tracks will be less likely to be blocked by demolitions, shelling or bombing than the main roads. And they will be carrying the attacking troops forward on the line of least expectation. It is probable, indeed, that the column on the minor road will, at the end of the day, be ahead of the columns on the main roads; and that it will be this column which will surprise the enemy and find the gap in his defenses.

Having now secured that the Division is advancing in fairly

compact form, we can proceed still further to shorten our columns. This we can do by closing them up.

The main reason for our wide dispersion of vehicles on the road is fear of aircraft. But this danger has been greatly exaggerated. No roads in this war could have been so persistently and accurately bombarded as were the roads leading to the forward areas during the Paschendaale offensive in 1917. Yet on those roads there was a continuous stream of head-to-tail traffic in both directions by day and night.

In mobile warfare conditions we are unlikely to meet such concentrated shelling; and air attacks on roads are not as accurate nor as sustained as artillery bombardment. Moreover, the troops on the road can reply to and diminish the effects of air attack by their light A.A. and small arms fire. And it is possible for our Air Force to prevent it entirely.

There is far greater danger today of an attack on the flanks of a column by armored formations, by guerrillas or parachutists. And it is difficult to guard against these if our flanks are thirty or forty miles long. By spacing our vehicles at sixty to the mile instead of twenty and by using four routes for our advance instead of two we shall divide the length of our columns by six.

So far, the only opposition we have encountered has been put up by our own side. But it has not prevented us from going forward rapidly and in strong formation, a *bataillon carré*. We must now prepare to meet the enemy's opposition. This will provide a variety of problems, and for each problem there will be various solutions. But certain general rules may be laid down for the guidance of our column commanders.

(i) The principle of *thrusting forward*. Each commander will be more concerned with going ahead than with anything that is happening to the other columns. He will, of course, keep in touch with them and he will strain to catch up with his neighbor. But he will not mark time to enable his neighbor to catch up.

(ii) The principle of *mutual support*. Since all are working for a common object, each commander will afford to his neighbor any support which may be necessary. But he will usually find that he can help best by pressing forward himself. He will thus threaten—and so hasten—the retreat of the enemy's detachment which is holding up his neighbor's column.

If direct support is required he will often be able to provide this with his artillery from their normal areas, while his other troops continue their advance.

The columns on the flank routes will, of course, always be aiding the other columns, since they will be acting as flank guards. But those on the interior routes will not be absolved from the responsibility of deploying guns and machine-guns to give depth to the defense of the flank. And the interior columns may reasonably be expected to be the spearhead of the advance—to seize bridgeheads and key positions for the general benefit.

(iii) The principle of *non-interference*. Each commander will avoid trespassing on his neighbor's area or appealing for his aid without good reason. Diversions on to a neighbor's route may sometimes be necessary, but any column so diverted will accept the treatment of a poor relation rather than demand the privileges of a guest, and it will take the first opportunity to get back on to its own route.

Of these principles the most important is the first. This it is which produces the speed which is so essential in war, whether



*Standard German half-tracks have their plate sloped like that of the armored cars. Advantage is taken of the space thus provided to build in lockers for supplies. Like all other vehicles in the desert, this one carried fuel for warmth during the cold night or for cooking.*

our object is to envelop a flank, to penetrate a center, to seize a key feature or to forestall the enemy's concentration by our own.

These are physical objects; but we may note that speed is not least among the moral weapons.

We will now look over the hill and consider what the enemy may do. His object is to stop our advance or, at any rate, to delay it. We are determined that nothing shall stop us and that delays will be reduced to a minimum.

The enemy, to achieve his object, will make use of material resistance, which will take the form of demolitions, and of human resistance, which will take the form of ground or air defensive and offensive action.

Material resistance cannot stop us, but it is bound to delay our progress. Human resistance may stop us entirely, but it may not even delay us.

As a general frame for the pictures which we shall now begin to paint we shall assume that the Division is advancing by four routes A, B, C, and D. And we shall deal with material resistance first.

Demolitions can take various forms, but space confines us to the consideration of a single case. We will suppose that route A is completely blocked by the explosion of a delay-action mine in a defile. The commander of column A will now apply his principles. First he will send his infantry over the crater on their feet, accompanied by such supporting arms as can be carried across the obstacle. A troop of field artillery will be immediately deployed, and an observing officer and signallers on their feet will take forward a telephone line to the best view point. Thus artillery cover for the marching infantry will be ensured for the next two hours.

*Column A is thrusting forward, though at only a quarter of its former pace.*

Its commander must next consider his responsibility of protecting the right flank. Here again he must give short measure. He cannot, perhaps, send an antitank gun forward—though these weapons can be remarkably nimble—but he can bring a couple into action on the near side of the crater to guard the *right rear* of the Division since he cannot guard its right. Machine-guns and mortars must, of course, go forward with the infantry, but they will be moving at walking pace; so the interior column will progressively expose its flank as it forges ahead.

*Column A is not performing its task of supporting Column B to the full. But it is doing something towards it.*

Contravention of the third principle is also inevitable. The bulk of the vehicles of column A must be diverted on to route



*Germany also uses pygmy half-tracks, built on the same general plan as the larger, all-purpose models.*

B; but not all. The Royal Engineers will remain on route A to deal with the crater, and some light A.A. guns will stay to protect them at their work, as also will a bus load or two of infantry. The transport which has been diverted may be able to get back to route A before many miles have been covered. And the column, weakened only by the detachments left behind at the crater, will soon be able to resume its full role of right flank guard.

*Column A has had to trespass on its neighbor's ground. But its interference has been on as small a scale as possible.*

It may be objected that the case will not be so simple if the demolition is a destroyed bridge over a deep and wide river. Naturally different ills call for different remedies. But it is true to say that, in general, there is hardly any obstacle which can prevent infantry from going forward, and no obstacle at all which can hold up the gunner's weapon, the shell. As for rivers, a Rhine should not prove a permanent obstacle any more than a Meuse or a Salween.

Human resistance, however, is the incalculable element in war. It will have to be overcome by fighting, and then anything may happen. But sound principles can help us to success.

We are already disposed in fighting formation on the road, and our advance must be conducted in such a way that the Division may be likened to a porcupine, bristling with quills all round. The quills, of course, as in the Flying Porcupine, will be made of fire. To achieve this object we must be constantly deploying our artillery, since artillery on wheels has no quills. Artillery of all types, therefore, must be well forward in the order of march and will drop out at intervals along the route. The guns so deployed will be piquets till the whole of the column has passed.

War, it has been said, does not admit of schedules; but the effective ranges of our weapons suggest that a unit of field guns should deploy at every fifth or sixth mile. Antitank units should by the same token deploy at every mile; but the nature of the country will often enable us to economize on this item. Light A.A. units will normally be deployed at defiles.

#### *Overtaking*

In a long advance over country where we may expect ground attack from the flanks we shall soon run out of artillery if we insist that the piqueting guns, when they resume their advance, shall remain at the tail of the column. They must, on the contrary, make their way up the column by travelling at higher speed and by not observing the routine halts. It will be noted that a troop of guns moving at thirty miles an hour will catch

up five miles in the course of a routine halt; and, as the normal speed of a column of all arms will probably be ten miles an hour, there can be considerable overtaking on the move. The principle must be accepted that the guns shall have priority. Otherwise they cannot provide continuous support.

#### *Enemy air action*

This may take the form of bombing, spotting for enemy artillery, reporting our position, or dropping parachutists to make a ground attack on our flanks or rear.

The bombing, as has been said before, we can to some extent deal with, since some of our quills point upward. Reconnaissance machines will have to be dealt with by our own Air Force and heavy A.A. controlled by higher formations. Parachutists will find us ready. We cannot, therefore, permit any air action to delay our progress. And surely we need not take it as a foregone conclusion that the enemy will have air superiority?

#### *The enemy's artillery*

Even without airplanes spotting for him, the enemy will probably shell the roads, on which we are advancing, with predicted fire. This may be very unpleasant, but it will probably have the effect of hastening our movements rather than delaying them. We cannot, while on the move, deploy a counterbattery organization, so we shall have to take our chance, comforted by the fact that the areas shelled by long-range guns will only be a small proportion of our route. The shelling will not become serious till we are within a few miles of the enemy's forward resistance zone. And by that time a higher formation behind us will have brought our own long-range guns into action; and the Air Force will have produced some reports and photographs.

The enemy's main resistance, however, will be more direct. Choosing his ground, he will bar the advance of one or more of our columns and we shall have to fight or maneuver our way through.

If column B is thus resisted, the continued thrusting forward of column A may, by its outflanking threat, induce the enemy to retire without a fight. But if he hangs on we must examine his object more closely. He may wish merely to delay us by forcing us to deploy for an assault, intending to slip away when that object has been achieved. This is ordinary rearguard action. Or he may be holding the post as a sally port for an attack with strengthened forces against our communications, if we decide to by-pass him.

Both objects make it essential that the post should have communications with its own rear; that it should be a cape or peninsula, not an island. Therefore column A must not be content with *threatening* the enemy's communications. It must *cut them*. That will insure that this particular detachment will not repeat its game a little farther along our route, and that we are left with an island to deal with.

The next step will depend on circumstances. It may be decided that the island must be liquidated forthwith, which case is beyond the province of this article, since we are only concerned with the advance. But an alternative policy is to leave islands to be dealt with by troops following up behind while the leading troops continue to thrust forward.

In the latter case we are fulfilling our first principle. We must fulfill our second by detaching weapons to keep the island under slow but continuous fire so that the troops which



are to attack it will have the maximum support. We must fulfill our third principle by not appealing for help from the Air Force. That arm will have plenty of more important jobs to do than those which can be performed by mortars and field artillery.

#### *Protection*

That a column using an outside route should aim at throwing out a protective screen on its exposed flank seems obvious. But since we have no cavalry this will not be so easy. For our transport will be largely confined to roads, and we may already be using all of them. It will often be necessary, therefore, to dispense with a flank guard for the flank column.

We have already taken measures against being caught unprepared by moving in a compact formation and by deploying artillery as pickets along the route. We may consider it advisable in the flank columns to supplement these pickets with machine-gun sections; and, since we cannot send a troop of horse to comb the suspicious patches of cover which command our route, we may be permitted to give them a burst or two from our guns to drive away guerillas or to induce them to disclose their presence. Advanced guards, however, we cannot do without since their absence will lead to delay. They deserve, moreover, a paragraph to themselves.

#### *Advanced guards*

To be always one crest ahead of the main body is the aim of all advanced guards. But scout cars and carriers which dash recklessly up to and over crests will soon be knocked out by antitank guns and rifles and by machine guns which are hidden on the forward or reverse slopes of these crests.

A policy of prudence would enjoin careful reconnaissance of the ground before the advance is made. But this will not do for a rapidly moving column. The vehicles of the advance must therefore dash ahead, but they should be preceded by a flurry of shells or machine-gun bullets to prepare their way. It is essential, then, that there should always be some artillery and machine guns in action to provide this covering fire for an advance *up to* a crest which may be held by the enemy. For an

advance *over* the crest we shall also require some antitank guns to take up Wellingtonian positions on the near side in case the enemy sends over armored vehicles in a counterattack.

Our carriers will also pause on the near side. They must avoid appearing on the crest without further preparation; and good general rules to follow are that the first man who looks *over* a crest should be a *man on foot*, and that one of the earliest arrivals should be a Forward Observation Officer. He may have to walk a mile, since some crests are very flat, but he will soon make up for lost time when he has by rapid reconnaissance made the plan for the next stage of covering fire, and so made it safe for his carrier to come up.

It must be remembered that the advanced guard may reasonably be expected to travel at a faster speed than—perhaps twice as fast as—the main body, so the pauses enforced by our policy of reasonable prudence will not delay the main body.

This speed of the advanced guard will have a considerable effect on our ammunition expenditure. For instance, the approach to a crest a mile and a half ahead will demand only five minutes of covering fire. Nevertheless, to rid our gunners of inhibitions, we shall send forward a lorry of ammunition with the advanced guard. Ammunition is only useful when it is up forward.

Much more could be written about advanced guards. We could discuss the question of allowing them to commit the main body to action, as was so often done by the Prussian advanced guards in the War of 1870—which, incidentally, they won. We could discuss Napoleon's use of advanced guards to fix the enemy while his main body maneuvered to destroy it. But these themes are beyond our province. We have conducted the advance into the enemy's country, brushing aside all minor attempts to stay our progress. Presently we shall come up against stronger opposition—and all along the line; the advance will develop into the attack. Then in the words of the Duke, "Let battle begin!"

## BEWARE OF THESE!

One of the best battery executives in the division had just put his battery in position. Noting that an orienting line had been thrown in, he laid his battery on Base Angle 1210, a rough guess as to the ultimate direction of fire. Later on the FDC sent him down the command, "Base Angle 825." The exec wanted to be quite sure that there would be no 100-mil errors this time, so he wrote 825 down under 1210, subtracted it, and then checked his work by adding the result (385) to 825 and getting 1210 again. No mistake here. So he grabbed up his megaphone and commanded, "Battery Adjust! Left 385, *etc., etc.*"

So the battery went left 385 instead of *right* 385—a nice big 770-mil error—and actually fired a volley outside the safety limits. It fell into a canyon, not far from some native workers; not far, moreover, from the large-T OP, where the battalion commander was looking intently, but in vain, at the lone tree far up on the plateau where the concentration was supposed to fall. This battalion commander, among other sterling virtues, is famed for a profane eloquence that would relegate Mark Twain

and some generals to membership in the Holy Name Society. To quote him, he "took off for the gun position like a cat shot in the burhind with a bootjack," and his remarks burned out three condensers in his SCR-610.

**Editor's Note: Just as the "big picture" of a battle is the sum of innumerable "little pictures" of the smallest units, so is artillery efficiency nothing more than the result of meticulous attention to the smallest details by every echelon. AGF tests are designed to show the true combat efficiency of all units.**

**A small error or a bit of thoughtlessness 'way down the line may render ineffective the fire of all the artillery of a division. In the hope of aiding units in training the JOURNAL intends to publish periodically examples of things to be avoided. Each of these things actually occurred. We realize that precisely the same mistakes will not often be made by different units, but a careful study of the errors of others may acquaint you with some types of things to watch for and to avoid.**

# RECOGNITION

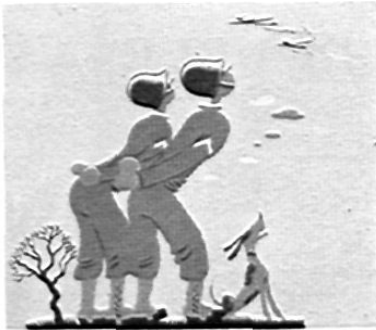
By Maj. Harold J. Bluhm, FA

Any statement regarding the importance of being able to recognize friend from foe is superfluous. All units should be able to make this distinction accurately and quickly, and act accordingly. Action taken should be in accordance with War Department or local theater directives. When the S-3 receives a directive requiring recognition instruction, he should be aware of the subject and the problems which exist.

First, we need someone to plan the training and supervise the instruction. If possible, let's find an officer who is interested in airplanes. Instruction in recognition can be very dry, and unless the instructor has enthusiasm for the subject he will experience difficulty in getting it across.

Training aids should be procured and studied and their value determined. Without training aids this instruction will be seriously handicapped. Some of these are:

*Airplanes.*—Planes in flight will furnish the best method of instruction possible. It is quite difficult to get planes for this purpose, but no opportunity should be lost to use this method. Planes flying in the vicinity of troops should be noted and identified. This may interrupt other instruction, but the noise of the motor will tend to divert the attention of the troops and time will be saved by calling attention to the plane, identifying it, or allowing a short discussion of its identity and then bringing the attention of the troops back to the original discussion.



*FM 30-30.*—An official publication showing several views of operational planes and may be used as a basis for instruction.

*Recognition.*—A magazine published monthly by the War and Navy Departments. It contains current information and pictures of friendly and enemy airplanes, ships and tanks.

*Identification posters.*—Large pictures of individual planes showing several silhouettes of the plane and following the WEFT system of description. Furnished by the AGO.

*Training films and film strips.*—Local film libraries have a large selection of films on this subject.

*Slides.*—2"×2" slides showing untitled pictures of planes may be procured from commercial establishments. These will fit the film strip projector.

*Models.*—May be procured locally or built. When suspended from the ceiling by wires, they allow the plane to be viewed from many angles.

*Balopticon.*—This machine can be used to show pictures clipped from magazines or other publications, and increases the number of views available.

Instruction should be based on the "flash" method of recognition. In this system the student learns to identify a plane instantaneously by its general appearance. WEFT (Wings, Engine, Fuselage, Tail) is no longer advocated, as the time

required to dissect a plane mentally may exceed that in which a plane is in sight or range. Constant repetition to develop sufficient familiarity to allow immediate recognition must be our goal.

In the initial instruction WEFT may be used, however, to describe the plane so that the student is familiar with its general appearance. Outstanding characteristics should be emphasized—such as the air scoop of the P40, which with a little paint can be made to resemble a shark's mouth. We have all seen pictures of this shark mouth and therefore should use it in our instruction to form a chain of associated ideas.

Armament, ceiling, bomb load, speed, and range of the plane should be indicated, and any action wherein this type of plane was used should be mentioned. In other words we must glamorize each plane as it is introduced in our study. This will develop interest and allow the student to build a chain of associated ideas for each plane.

During the introduction a chart or picture of the plane should be displayed and structural features pointed out as they are described. Training films or film strips should be used frequently to augment this phase.

The number of planes introduced at any one session should be limited to two or three, depending on their familiarity.

After the introduction the Balopticon or film strip projector should be used to flash a picture of the plane on the screen for about 5 seconds. This space of time is too short to enable the student to analyze the plane and will force him to view it as a whole and make his decision instantly. As the instruction progresses this interval should gradually be reduced to 1 or 2 seconds.

When the picture is flashed on the screen the class should call out the plane's name or numerical designation. Then the picture is flashed on the screen again and the instructor should point out the outstanding visible characteristics which definitely identify the plane.

During each succeeding period when new planes are introduced, short tests should be held on the planes which have been covered in preceding periods. This test should be held at the start of the period and the student should write his answer on a piece of paper. At the conclusion of the test the pictures should be reshown and identified by the class as a whole. For the final examination slides should be used that have not been shown before, to prevent the students from memorizing pictures instead of planes.

Training should be planned to cover Army and Navy operational aircraft. It is best to limit the number taught in the initial instruction in order to prevent the student from becoming confused. A training program of one hour a day for 15 days should be sufficient to cover these planes. From then on refresher periods and tests should be introduced periodically so that the instruction is continuous. During these periods enemy planes that are similar to ours should be introduced for comparative purposes.

Although the main instruction should be progressive and controlled, no opportunity should be lost to guide the men's thoughts into this subject during periods of rest or relaxation

or during other instruction. Mention has been made of calling the troops' attention to airplanes flying past the training area.

Models hung in the barracks will subject the troops to subconscious instruction many times during the day. Pictures on latrine walls can be an effective aid.



Playing cards with airplane silhouettes can be purchased, but the amount of instruction received from these cards is questionable: when being used the numbers in the corner seem to hold the interest, rather than the plane in the center.

An extracurricular training aid that might be considered is the Post Theater. If arrangements can be made with the officer in charge, slides of planes could be flashed on the screen before the

start of the show and during intermissions. The lights in the theater could be left on and when a plane is flashed on the screen, the audience would be encouraged to call out its name. This may start some good-natured arguments which could be terminated by flashing the name on the screen. The average soldier naturally desires to excel and will attempt to display his ability whenever possible. This would not interfere with the regular show and would be an effective method of keeping the subject continually impressed on troops. When a plane appears on the screen during the show, the audience should attempt to identify it. Many of the news reels are taken under battle conditions and represent the type of flash recognition necessary.

Question-and-answer columns in local publications should be encouraged and used as another method of developing familiarity.

Although this discussion has been devoted to aircraft, the study of mechanized vehicles should follow the same principles. Recognition instruction should be started early in the training program, be continuous, and include all personnel. When we reach the combat zone the enemy will provide sufficient incentive for us to learn their identity quickly and accurately. This is a late time to start our instruction, however. We must develop our own incentive during our training period so that the ability has been acquired before we need it.

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## TROUBLE DOUBLE

By Hiram J. Herbert

Republished by courtesy of "Collier's"

John Gilleland was something of a genius of his day. If his ordnance-revolutionizing plan had worked, the history of the world would have been stepped up considerably. John Gilleland lived at Athens, Georgia. He viewed with alarm the encroachment of the Federals, so sat himself down to figure out a means of bringing the Civil War to a speedy end.

The multiple firing of heavy charges in those days was unheard of, but John Gilleland set out to devise a piece of field artillery that would, with one lighting of the fuze, actually "mow 'em down." He well-nigh succeeded.

Despite his illusions of mayhem, Gilleland was highly regarded by the citizenry of Athens, and when he disclosed his plan and his requested needs, householders poured forth with all their scraps of iron. Gilleland forthwith melted down the iron, poured it into strange molds, and there emerged before the astonished eyes of the townspeople the world's first double-barreled cannon. Mounted on wheels, it was a beautiful, and apparently deadly, piece of armament, indeed.

The idea was to fire from the barrels, which were built into the cannon in the same type of alignment as found in the double-barreled shotgun, two cannon balls, each about four inches in diameter. The balls were cast, each with a heavy iron staple embedded. A long, heavy chain was forged, and each end stoutly affixed to a staple. Thus Gilleland had a long chain with a heavy cannon ball on each end. Now all that had to be done was to stuff the balls down the twin barrels and fire them out. In this process the chain would become tautly extended,

and in its mad parallel slash just above the ground would, like a giant sickle, cut down the enemy.

The big cannon was wheeled to the head of Main Street for the christening demonstration. The barrels were heavily charged with black powder, wadding was tamped in, and then the two balls were rammed down the iron tubes. The crowd now looked upon a new kind of cannon with fifty or more feet of heavy chain drooping from the mouths of the twin barrels. History was on the verge of being made.

The fuze was lighted. Both barrels of the cannon fired with a deafening roar that sounded like the end of all eternity. But one of the barrels fired a split moment before its mate belched forth.

Down Main Street charged a whirlwind juggernaut of stretched iron chain, flinging two cannon balls in ten thousand different directions. Like a Herculean flail it tore at the town. Women screamed for their children; men moaned, their eyes glued to this mad dancing monster; dogs howled; mules brayed and tore away in a mad rush from the path of the iron cyclone.

A swing of the chain jerked the pillars from an upstairs balcony, and down crashed fernery, porch, and all. Two mules were killed. A stubborn cow went wall-eyed and stayed that way for days. Store fronts were smashed. Buggies were wrecked. Beyond the town, the runaway chain came to rest. Fortunately, no persons were seriously injured.

No one would risk a second trial shot with the cannon, and the dream of John Gilleland went up in one great blast. To this day the cannon reposes, a silent reminder, on the north lawn of Athens' City Hall.

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### FIELD MANUALS

4-25—Service of the Piece, 155-mm Gun (G.P.F.)

6-77—Service of the Piece, 4.5-inch Gun, M1

6-86—Service of the Piece, 155-mm Gun Self-Propelled

31-50—Attack of a Fortified Position

17-36—Employment of Tanks with Infantry

17-100—Armored Division

21-75—Scouting, Patrolling, and Sniping

# Not in the BOOK

## PUSHING INTO POSITION

Our towed Tank Destroyer Gun is a wonderful weapon, but many officers condemn it because they think it's slow going into position. Our unit has developed a new technique which we feel reduces this time to where we can compete with even the self-propelled for a short distance.

The photos are self explanatory; a front pintle is the answer.



We leave the position of readiness pushing the guns. If additional security is necessary the gun crew advances first on foot, and secures the gun positions; if not necessary they ride as usual. The big advantage is that they roll right up to the position with the gun pointing in the right direction. They do not have to turn around, or stop short and back by hand the gun into position. They do not expose themselves by showing the big prime mover on the sky-line, and the time saved is so vital in a meeting engagement.



We also have the security section's ¼-ton equipped with the front coupling, and have used it in emergencies when it has been necessary to camouflage the prime mover some distance away from the gun position. If an emergency arises which makes it imperative that the gun be moved at once, or if we get a mission of advancing against armor in very close country, we place a couple of boxes of ammunition on the jeep, the crew moves out as security, and we work right into the firing position.

LT. COL. PAUL B. BELL, FA

## SAVE YOUR CELLOPHANE

Prior to shipment overseas most troops are issued new gas masks, which are protected by a cellophane cover. Most (if not all) of the men discard these covers instead of using them for a practical purpose.

Cigarettes and matches can be kept dry indefinitely; wallets and Individual Pay Records can be preserved and kept dry for long periods of time; an improvised cover for your "overseas" cap can be made quickly, also.

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.*

And for you Platoon Leaders: the cellophane cover can be slipped over your clip-board to keep your rosters and other notices dry while calling the roll even in rainy weather.

It's well worth the effort to lug them all the way over. You won't regret it.

SGT. MITCHELL S. JELEN, FA

## MAP KEY FOR FOs

Before going out, FO puts 1 to 4 grid intersections on his photo and numbers them to agree with S-2 or -3's copy. No other writing or symbols appear on the photo. In his head FO carries a 2-letter code group (such as AM or RO).

FO must keep FDC constantly informed of his location. Assume that the day's code group is BO and that FO is 1,500 yds. east and 2,500 yds. north of the grid intersection which has previously numbered 2. Point-designated coordinates increase alphabetically to the east and north, so FO radios, "My location: reference number two, Charlie Queen five five."

If FO is 2,600 yds. west and 2,400 yds. south of grid intersection 1, as coordinates decrease to the west and south he reports his location by sending, "My location: reference number one, Yoke Love four six."

This system is easy to learn, fast in operation, and—best of all—leaves the photo free from information of value to the enemy and the FO unburdened by templates or complex prearranged codes.

MAJ. D. S. HULL, FA

## REALIGNMENT REFINED

Here is a thought that I have never seen in any field manual: "The rule as stated in FM 6-40, Par. 32, should not be applied in realigning aiming stakes at the completion of registration on a base point or check point."

At the completion of a registration the gun is actually laid in the direction to hit the base point. If the gunner then corrects for displacement by laying on the far stake, referring to the near stake and then laying on the far stake *with the new reading*, as prescribed in FM 6-40, that laying will be changed. Hence, after correcting for displacement and recording base deflection, the recorded base deflection will be in error by the amount of the correction.

A more accurate procedure would be not to correct for displacement at all, but simply to realign stakes by moving the near stake into line with the far without disturbing the laying of the piece.

After registration using this method, the other pieces must be relaid parallel to the base piece if displacement of the base piece has occurred during adjustment because a part of the deflection shifts made during adjustment was in compensation for the displacement.

This procedure will not give accurate results if the piece has displaced in the last round or so of the registration, but that condition is very rare with split-trail materiel.

If any piece displaces in later missions the book procedure should be used in correcting for displacement and realigning stakes, as that procedure results in the gun's being relaid parallel to its laying prior to firing the mission.

LT. MANFRED W. EHRICH, JR., FA

## FILM STRIPS

- 6-50—Sighting and Laying Equipment Tests and Adjustments—155-mm Gun M1 and 8-inch Howitzer M1
- 6-51—Field Artillery Conduct of Fire—Axial Bracket
- 6-52—Field Artillery Conduct of Fire—Lateral Precision, Small-T Methods
- 7-129—57-mm Gun, Antitank, M1, Part I—Characteristics and Description
- 7-130—57-mm Gun, Antitank, M1, Part II—Disassembly and Assembly
- 7-132—The 57-mm Gun, Antitank, M1, Part IV—Care and Preservation

# Diary of War Events

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

## MARCH, 1944

- 1st Germans use new radio-controlled tank loaded with high explosives in drive against the Anzio beachhead. Allies repulse the attack.  
U. S. troops beat off Jap counterattack and retain control of the important airfield on Los Negros Island.  
British heavy bombers drop 2,125 tons of explosives on Stuttgart.
- 2nd Allied troops in Italy repulse 3-day German assault and retain the Anzio beachhead.  
U. S. heavy bombers attack industrial cities in southwest Germany.
- 3rd U. S. Navy medium bombers attack Paramushiru, Jap home territory, for the 13th time.
- 4th MacArthur's forces in the Admiralties take a Jap toll of 3,000 casualties at a cost of 61 American killed, 244 wounded.
- 5th U. S. 8th Air Force Liberators bomb the German bomber and fighter base at Cognac, and other targets in southwest France.  
Allied fliers bomb Rabaul, in New Britain and in the Wewak area of New Guinea. Destroy 20 Jap planes.  
U. S. Army-Navy bombs Ponape and Kusaie in the Carolines.
- 6th U. S. Flying Fortresses and Liberators give Berlin its heaviest daylight raid. Encounter strong fighter opposition all the way from the coastline to Berlin. U. S. escort fighters shoot down 83 planes. Complete bomber score lacking. We lose 68 bombers and 11 fighters.  
U. S. forces go into action on the continent of Asia and capture Walawbum, southeast of Maingkwan, in Burma's Hukawng Valley.  
MacArthur's forces capture Paula Plantation, behind the Jap lines at Mindiri.
- 7th U. S. Marines from Cape Gloucester land on Talasea Peninsula, 160 miles from Rabaul.
- 8th 2,000 U. S. heavy bombers raid Berlin. Shoot down 83 German planes. Lose 38 bombers.  
U. S. Navy makes 14th raid on Paramushiru.
- 9th U. S. Air Force bombs Berlin for 2nd straight day. Encounter little opposition from the *Luftwaffe*. Lose 7 bombers and 1 fighter from AA fire.  
MacArthur's forces at Talasea advance to within 2 miles of the Jap airport.
- 10th Russian troops advance to the outskirts of Tarnopol.  
Mediterranean Army Air Forces bomb railroad yards of Rome.
- 11th U. S. Air Force in Italy bombs Florence for 1st time.  
U. S. bombers from Britain raid Muenster in western Germany and the Pas-de-Calais area of France.
- 12th Great Britain orders indefinite suspension of all travel between the United Kingdom and Ireland.  
U. S. 8th Air Force bombs Pas-de-Calais area of France.  
U. S. forces land on Wotho Atoll in the Marshalls and occupy it without opposition.  
U. S. bombers in the Southwest Pacific raid Wewak, New Guinea, and Rabaul, New Britain. Shoot down 26 Jap planes.
- 13th Red Army captures the Black Sea port of Kherson.  
American-led Yugoslav Partisans capture Pucisce on the Island of Brac.  
Allied forces on Bougainville Island repel Jap attacks to break the beachhead at Empress Augusta Bay.
- 14th British troops open new front against the Japs in Burma and cross the Chindwin River 110 miles southwest of the American-Chinese forces along the Ledo Road.  
Navy bombers in the Pacific attack Oroluk, a Jap-held atoll 230 miles east of Truk.
- 15th Allied air might in Italy bombs Cassino into ruins.  
U. S. heavy bombers raid plane industry of Brunswick, Germany. Lose 3 bombers and 5 fighters.
- 16th 1,000 British and U. S. bombers raid western Germany. Shoot down 82 fighters. Lose 62 bombers, 17 fighters.  
MacArthur's troops on Los Negros Island advance to within ½ mile of Lorengau air base.
- 17th U. S. heavy bombers from Italy bomb Vienna while others from Britain bomb the railway of Creil, 25 miles north of Paris.  
MacArthur's forces capture Jap Airfield at Lorengau on the the Island of Manus in the Admiralty Islands.
- 18th U. S. bombers from Britain raid southern Germany.
- 19th U. S. Flying Fortresses from Britain bomb Pas-de-Calais area of France. Fortresses and Liberators from Italy bomb Klagenfurt and Graz in Austria.
- 20th Germany marches into Hungary and takes full possession of the country. Heavy fighting continues at Cassino, Italy.  
U. S. Flying Fortresses and Liberators bomb Frankfort-on-the-Main. Lose 6 bombers.  
Allied fliers in the South Pacific sink 2 Jap transport ships off the New Guinea coast.  
U. S. battleships and carrier planes pound Mili atoll in the eastern Marshalls.  
U. S. Marines land on Emirau Island, in the St. Matthias group, 84 miles northwest of the major Jap base of Kavieng, on New Ireland.
- 21st U. S. Liberators bomb the Pas-de-Calais area of France  
Maj. Gen. A. M. Patch takes over the command of the 7th Army, relieving Lt. Gen. Patton, whose new command is not disclosed.
- 22nd U. S. Fortresses and Liberators bomb Berlin. R.A.F. pounds Frankfort. Lose 13 bombers and 9 fighters.  
Reinforced German troops attack Cassino but Allies repel all advances.
- 23rd Approximately 600 U. S. heavy bombers escorted by 1,000 fighters raid Hamm, Achmer, Handorf, Muenster and Brunswick in northwest Germany. Lose 27 bombers and 6 fighters.  
Jap troops cross into India and advance to within 22 miles of Imphal.  
Allied fliers over the north of New Guinea sink 2 Jap freighters, 7 coastal vessels and 23 barges attempting to reinforce their garrisons.
- 24th U. S. airforce bombs Frankfort and Schweinfurt for the 3rd straight day.
- 26th 1,700 U. S. planes raid the invasion coast, airfields around Paris and the Netherland ports. Lose 6 bombers and 1 fighter.
- 27th More than 600 Flying Fortresses and 1,000 fighters raid 9 German airbases and the freight yards at Tours. Destroy 38 planes, lose 6 bombers and 15 fighters.  
U. S. Army and Marine planes raid Truk's outpost at Ponape. Other fliers in the southern end of the Pacific bomb Kavieng, New Ireland, Rabaul, New Britain and Wewak, New Guinea.
- 28th U. S. bombers again raid advance enemy air bases in France. Destroy 30 planes. Lose 2 bombers and 3 fighters.
- 29th U. S. Bombers from Britain raid Brunswick while others raid the Pas-de-Calais area. Shoot down 39 planes and lose 9 bombers.
- 30th Red Army captures Cernauti and Delatyn, only 15 miles from the Tartar Pass into the Balkans.  
Allied fliers from the Marshalls and Southwest Pacific bases bomb Truk.
- 31st U. S. 7th Air Force bombs Truk for the 3rd time in 36 hours.  
Maj. Gen. Orde C. Wingate, spectacular British jungle-fighter, dies in a Burma plane crash.  
R.A.F. lose 94 heavy bombers in a raid on Nuremberg.



# For Heroism and Service



## DISTINGUISHED SERVICE CROSS (Posthumously)

2ND LT. MICHAEL LIGUS, JR., established his forward observation post on the contested hilltop with the foremost elements of an Infantry battalion. As he relayed instructions to the fire control center, the Germans mounted their counterattack, which carried to within 30 yards of the officer and the advance Infantry units. The German advance necessitated swift adjustment of American artillery fire. Despite the proximity of the enemy to his own position, he called for it without hesitation. Lt. Ligus remained at that station more than two hours, with supporting Infantry falling on all sides under the ferocity of the German drive. Both sides fought doggedly and the distance between opposing forces lessened as both inched forward on the crest of the hill. Finally, it became impossible for Lt. Ligus to direct fire against the enemy without endangering the Americans battling all around him. Accordingly, he crawled toward the enemy, the bulk of his radio equipment making detection almost inevitable. His orders came through steadily and his advance continued until he was killed by a mortar shell. The ground on which Lt. Ligus died was won and held. Lt. Ligus' performance demonstrated great courage under fire and impregnable loyalty to duty, providing an enduring example of the historic traditions of the Army of the United States. Address, 328 Olivia St., McKees Rocks, Pa.

## SILVER STAR

T/SGT. ARTHUR J. HEDBURG, for devotion to duty after German artillery destroyed the command post of their Field Artillery battalion. When the enemy laid his barrage on the command post, one man was killed outright and several more were severely injured. The commanding officer's telephone lines to the three batteries of heavy artillery guns were destroyed in the barrage. Sgt. Hedberg moved his radio out of a well sheltered position into the open where the enemy shells were landing so that he could gain better facilities for sending the commanding officer's orders. The enemy barrage lasted for two hours, during which time Sgt. Hedberg stayed at his post with utter disregard for his personal safety. Through his action and direction the American guns were able to counter the enemy's fire before the telephone lines could be repaired. The incident occurred in the Sicilian campaign. Address, 2455 N. Lowell Ave., Chicago, Ill.

T/4 OSCAR J. IRWIN, for gallantry in action on Roosevelt Ridge, New Guinea, on 27 Jul 43. Address, Genoa, Neb.

S/SGT. LADISLAUS W. KUSEK, for gallantry in action in the vicinity of El Guettar, Tunisia, on 23 Mar 43. During a strong enemy armored and infantry attack on our positions, wire communications were being constantly shot out and direct radio communication, due to the rugged terrain, was not possible. Sgt. Kusek voluntarily manned a radio relay post alone in an exposed position through several bombing attacks and artillery concentrations. His courageous action was of material assistance in repelling the enemy. Address, 15 Roberts St., Southbridge, Mass.

S/SGT. RICHARD W. MCGREGOR, for devotion to duty after German artillery destroyed the command post of his Field Artillery battalion. When the enemy laid his barrage on the command post, one man was killed outright and several more were severely injured. The commanding officer's telephone lines to the three batteries of heavy artillery guns were destroyed in the barrage. Sgt. McGregor moved his radio out of a well sheltered position into the open area where the enemy shells were landing so that he could gain better facilities for sending the commanding officer's orders. The enemy barrage lasted for two hours, during which time Sgt. McGregor stayed at his post with utter disregard for his personal safety. Through his action and direction the American guns were able to counter the enemy's fire before the telephone lines could be repaired. The incident occurred in the Sicilian campaign. Address, 107 Eighth St., Minot, N. D.

PVT. HAROLD E. MILLER, for gallantry in action at Roosevelt Ridge, New Guinea, on 30 Jul 43. Address, 1779 15th St., San Francisco, Calif.

CPL. WALTER D. MORGAN, for devotion to duty after German artillery destroyed the command post of his Field Artillery battalion. When the enemy laid his barrage on the command post, one man was killed outright and several more were severely injured. The commanding officer's telephone lines to the three batteries of heavy artillery guns were destroyed in the barrage. Cpl. Morgan moved his radio out of a well sheltered position into the open area where the enemy shells were landing so that he could gain better facilities for sending the commanding officer's orders. The enemy barrage lasted for two hours, during which time Cpl.

Morgan stayed at his post with utter disregard for his personal safety. Through his action and direction the American guns were able to counter the enemy's fire before the telephone lines could be repaired. The incident occurred in the Sicilian campaign. Address, 625 N. Stanley Ave., Los Angeles, Calif.

PVT. ROBERT W. RICHARDSON, for gallantry in action near Tambu Bay, New Guinea, on 15 Jul 43. Address, 613 Kitchener St., Detroit, Mich.

HOWARD A. SMITH, JR., 0-413,109, Captain, Cannon Company, \* \* \* Infantry Regiment, for gallantry in action on \* \* \* October 1943, in the vicinity of \* \* \*, Italy. When the attack of the 2nd Battalion, \* \* \* Infantry, was stopped on low ground, observation upon enemy positions was nil except in places covered by enemy automatic weapon's fire. In the absence of an artillery observer, Capt. Smith, with utter disregard for his own safety and on his own initiative went forward and established an observation post. He exposed himself to enemy machine-gun fire to secure the much needed observation and brought the fire of his Cannon Company to bear on the enemy position, neutralizing their fire. Later when one platoon was making an attack upon enemy positions, Capt. Smith went forward through intense enemy machine-gun, small arms, and mortar fire to gain better observation. By doing this, he was able to locate several enemy machine-gun emplacements, direct the fire of his Cannon Company on them and destroy them. Capt. Smith's initiative, courage, and devotion to duty were exemplary and are a credit to the Armed Forces of the United States.

CAPT. HERBERT M. VINES, was directing the firing of his battery's guns when his artillery position was subjected to counter-fire from a German battery and one of his men was wounded. He immediately went to the aid of the wounded man and was directing his evacuation when hit by fragments from another exploding shell. Address, Bessemer, Ala.

COL. WILLIAM E. WATERS, for gallantry in action in the vicinity of Troina, Sicily, on 31 Jul 43. During an attack, a portion of our advancing infantry came under concentrated artillery, mortar and small arms fire and was stopped. Communications were disrupted and the situation became acute. Col. Waters went forward through heavy artillery fire to visit the infantry and artillery command posts and obtain personal knowledge of the situation. His sound judgment, instant appreciation of the difficulties and thorough understanding of the mechanics of artillery support enabled him to take prompt and decisive action. His suggestions and orders resulted in being the needed artillery support at the critical moment and enabled the Division to resume its advance. His coolness, leadership and example were directly responsible for the success of our arms and inspiration to all who participated. Address, Louisville, Ky.

## SOLDIER'S MEDAL

T/S WILLIAM C. LINE, JR., for heroism displayed in saving another soldier from serious or fatal burns at the 3d Armd FA Bn bivouac area in the vicinity of Yellowpine, Texas, on 9 Dec 43. T/S Line, seeing a soldier ablaze and running about, with rate presence of mind overtook the man, threw him to the ground, and quickly extinguished the flames. Through utter disregard for his own safety he saved the soldier from more serious burns than were incurred or probable loss of life. Address, 2236 King St., Saginaw, Mich.

SGT. GEORGE R. OWENS, for heroism on 15 June 43 at Port Aux Poules, Algeria. While swimming in a rough sea, a fellow soldier become exhausted and shouted for help. Upon hearing the cry of the drowning man, Sgt. Owens, with disregard for his own personal safety, swam out against the strong undertow to the helpless soldier and brought him safely to shore. Address, R.F.D. 4, Newberry, S. C.

PVT. 1ST CLASS SANTO P. TAVORMINA, for heroism in the Tennessee Maneuver Area on 1 Nov 43. During the preparation of the morning meal for a battery of field artillery, a fire broke out in the organization's field range which quickly spread to other parts of the truck in which the range was installed. The cook on duty attempted to extinguish the fire with a fire extinguisher. However, before he could accomplish this he was overcome by a combination of gases caused by the vaporized pyrene, smoke from burning grease, fumes from burning gasoline, and pungent acrid smoke from the burning plastic screen which enclosed the truck, and fell unconscious to the floor of the vehicle. At this time the truck was filled with flames, gas, and smoke. Realizing the danger to which the cook was exposed Pvt. Tavormina, without regard for his own personal safety, entered the truck through the flames and pulled him outside to safety. Address, 532 Livingston St., Elizabeth, N. J.



# BOOK REVIEWS



*ORDEAL IN BATTLE.* By Capt. Cyril Falls. 184 pages: index. Oxford University Press. \$1.75.

Capt. Falls has been the military correspondent of the *London Times*, and is a past writer on modern warfare. In his present book he discusses the strategical aspects of war, as especially exemplified by recent campaigns.

He differentiates between principles of war and elements of war, and finds that there are five of each. Principles of war have for long been recognized. There have been differences of opinion as to their number, partly due to differences in definition. In this book, 4 of the 9 Principles found in our Field Service Regulations of older times are accepted, and a new one is added. The 5 "elements" are a new classification.

The five principles recommended by the author are the principle of the objective (or undeviating thrust).

- economy of force,
- surprise,
- security, and
- aggressive reconnaissance.

The latter is a new one. It really is a special form of security. In these days, due to the general motorization of forces in the field, events and conditions change rapidly. It is indeed necessary to have a live and aggressive individual seeking constantly for information concerning the enemy. The principle is not different from what it used to be, but its application is.

The author does not consider the principle of the offensive, so dearly thought of by many, as established. He covers this among the "elements," which are

- moral (which includes leadership, and the quality of the troops),
- gambling,
- friction,
- fog, and
- diminishing force of the offensive.

Gambling is defined as a willingness to take risks. The general who never starts an operation until all chances have been eliminated by 100% preparations against every possibility is liable to be defeated for his failure to have acted when opportunity came.

Friction as a military term is taken from Clausewitz. It relates to the difficulties of coordinating numerous arms and services under conditions often very trying. It includes accidents beyond control of the High Command, weather, losses caused by the enemy, misunderstandings, etc.

Fog—usually referred to as the fog of war—is absence of essential information concerning the enemy and his intentions.

The diminishing force of the offensive is caused by accumulating losses of troops, expenditure of supplies, and increasing lengths of communications. Capt. Fall admits that with a good service of the

interior, which will keep lines of supply open and furnish ammunition and supplies in constant volume, offensives do not diminish to the same extent as formerly. Probably a more important feature is to maintain the quality of troops in line at a high figure during a prolonged offensive.

A chapter on leadership in war covers particularly the civilian leader of a democracy. No man is infallible and all make mistakes. A leader must be accepted "as is." Disadvantages must be balanced against advantages, for there will always be both. It is easy to pick flaws. The problem is, can anyone do better?

Developing his idea that the offensive is not necessarily to be preferred, he includes an interesting chapter on tactics of defense as illustrated in the current war. There is no question that modern defense by large forces can be most effective. The Russians used it with considerable success during the first year of their war with Germany.

There is a good chapter on Logistics. This is an excellent word, which has been neglected. We are replacing it by Services, yet the two words are not synonymous. Logistics includes services and much more. It might be a good thing to readopt the word and pay more attention to what it denotes.

*Ordeal in Battle* is interesting. It will repay careful reading and re-reading. It is one of the best books on this war's developments which have appeared. C. H. L.

*LONG WERE THE NIGHTS.* By Hugh B. Cave. 210 pages. Dodd, Mead & Co. \$3.00.

This book offers an authentic account of 4 months of bitter fighting of an entire PT squadron around Guadalcanal. The story was told to the author by the Squadron Commander and two of his boat Captains. It is extremely interesting and exciting. B. H. W.

*THE ROAD TO TEHERAN: The Story of Russia and America. 1781-1943.* By Foster Rhea Dulles. 261 pages; biographical notes: index. Princeton University Press. \$2.30.

"There are at present two great nations in the world," Tocqueville wrote a century ago, "which seem to tend towards the same end, although they start from different points. I allude to the Russians and the Americans. . . . Their starting point is different and their courses are not the same, yet each of them appears to be marked by the will of heaven to sway the destinies of half the globe." The hundred years since Tocqueville wrote this have seen great changes in Russian-American relations, yet the truth of the statement cannot be questioned. Russia and America are seeking the same end, though sometimes Mr. Dulles is forced to trace a crooked path through the wilderness of their relations to prove it.

Perhaps the outstanding fact of our relations with Russia is that we have been at peace for more than a century and a half. The United

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States has warred against every other major power in that time, but Americans and Russians have always fought as allies, never as *declared* enemies (the italicized *declared* is to acknowledge our Siberian and Archangel expeditions in the last war, which were a weird specie of undeclared belligerency).

Autocratic Russia and democratic America tried to uphold the freedom of the seas during the Napoleonic wars. Alexander tried to mediate our war with Britain in 1812; we sympathized with Russia during the Crimean War; and Russia stood by the Union during the Civil War. No nations could have been closer after the Alaska purchase, and despite the increasing reactionism of the Czars late in the nineteenth century, which offended republican America, the growth of imperialism in Japan drew Russia and America closer together again. The First World War found them allies and friends, but the Bolshevik revolution smashed the cordial relations, and they stayed smashed for sixteen years.

The account of those sixteen years forms half the book, certainly the more interesting half to the general reader. Mr. Dulles picks his way carefully through the complicated relations of these years, and his story is surprisingly unbiased considering the great bias with which Russia has been viewed by the Reds and Capitalists in this country. Only the hottest advocate of one side or the other could object to Mr. Dulles's account of how the difficulties between the countries were settled, and how Roosevelt and Stalin took the road to Teheran and met there to try and abolish the last of the barriers between the two greatest nations in the world.

Mr. Dulles has done a fine job for the general reader, and anyone who hasn't time or inclination to study Russian-American relations deeply, will find this a satisfying and interesting book. R. G. M.

*THE AXIS GRAND STRATEGY. Compiled and edited by Ladislav Farago. 580 pages; bibliography: indices. Military Service Publishing Co. \$3.50.*

Next in importance to "know thyself" is "know thine enemy." This injunction clearly covers such things as his habitat and its geography and climate; his institutions, language, and culture; his resources and the state of his industry; and such other things as can be reduced to statistical graphs and tables. Of at least equal importance is the enemy's mind. One of the best ways to learn what ticks inside it is to examine his thoughts as published through the years in his own books and journals for home consumption.

This is what Mr. Farago does. What emerges is a strikingly clear picture of current Nazi military views. Even though some of the writings date back to Clausewitz, they have had a continuing influence through the years. This is especially true in view of the German pride in the methodical approach, which involves the periodic rereading and redigesting of all that had previously been set down on the subject at hand. This system assured that no author's work would be neglected, but would keep bobbing up into at least the momentary light of day.

Most of the selections are from the late '30s, some from the '40s. Well chosen, edited, and grouped, they cover not merely the big generalities, but also much concrete matter on the organization and functioning of a war machine *per se*. They extend beyond military operations—as does also the German concept of war—to political and economic weapons, to psychological warfare and the use of "fifth columns" (in plain words, traitors and spies), and geopolitical strategy that is global in scope. Would that some of these articles had received more serious attention when they first appeared!

Throughout, Mr. Farago has judiciously pruned and summarized his material to avoid that excessive wordiness of which the Germans are so fond. Frequently he interjects his own comments; usually these are shrewd and sound. All in all I found this original material by staff officers of the German army, navy, and air force fascinating.

*A PREFACE TO PEACE. By Harold Callender. 288 pages: index. Alfred A. Knopf. \$3.00.*

The author, a *New York Times* foreign correspondent for 15 years, gives us his version of *A Preface to Peace*. He does not necessarily offer a solution for permanent peace, but from his wide and extensive foreign experiences he presents sound and logical reasons which our diplomats will have to deal with before such a peace is definitely assured.

# BATAAN

## The Judgment Seat

By Allison Ind, Lieutenant Colonel, M. I.



• "Here is an 'inside' story written with the authority of one who is as excellent a writer as he was a valorous fighter. Ind does not pull his punches . . . Bataan becomes a fact—as large as life, as bitter as death."—*Col. Carlos P. Romulo in The N. Y. Times Book Review.*

Colonel Ind, who spent a historic year in the Philippines before escaping to Australia, has written in this book an authentic account of all that happened there.

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The book deals largely on American foreign policies. It tells why certain decisions were made and their results. It is written not for the statesman or diplomat but rather for the average and typical American who has had little personal contact with the world abroad, yet whose opinion is sovereign in foreign as in domestic affairs. It is truly interesting and informative. B. H. W.

*JAPAN'S ISLANDS OF MYSTERY.* By Willard Price. 256 pages; index; illustrated. The John Day Co. \$3.00.

In 1935 Willard Price managed to get a good look at Japan's mandated islands. He is one of the very few non-German whites who in recent years got into the islands—and got out whole. An American Marine colonel reached Palau; he died there mysteriously. Two naval officers slipped onto Ponape and died of an "accident." A British major, shipwrecked on Yap, was sent away three days later. But Willard Price and his wife spent weeks on end among places now in the news.

Yap, Palau, Truk, Ponape, and Kusaie were visited, along with Saipan and Guam. Price saw a lot, and his account is one of personal adventure, human interest, and highly interesting background facts. As Col. Lanza points out (see p. 306 herein), although Pacific islands are of two general types, there is considerable difference in detail among them. Mr. Price gives an excellent idea of the terrain and of the native inhabitants. Although on his trip he posed as an "absent-minded professor," he had a good eye for items of military and naval import; many of these find their way into his book.

Mr. Price also discusses the adjacent Marshall and Gilbert Islands, and Wake Island, in their relation to Pacific strategy.

*Japan's Mandated Islands* is lucid and highly informative. It is especially valuable now, when our approach to Japan is gathering momentum.

*AN INTRODUCTION TO NAVIGATION AND NAUTICAL ASTRONOMY.* By William G. Shute, William W. Shirk, George F. Porter, Courtenay Hemenway; illustrations by Arthur P. Koch. 448 pages; index; illustrated. The Macmillan Co. \$4.50.

These instructors in mathematics and navigation at The Choate School have produced one of the most practical elementary books on this topic that have come our way. For one thing, it is complete in itself—no supplementary tables, charts, etc., are needed: in a back-cover pocket are even a cardboard protractor and scales. For another, the contents are well integrated: as new subjects are taken up, earlier material is often summarized to show how the new fits in. Not only is the text clear and plain, with all technical terms carefully explained, but all is extraclearified by excellent diagrams and illustrations throughout the book.

*INTERVENTION AT ARCHANGEL.* By Leonid I. Strakhovsky. 311 pages; bibliography; index; maps. Princeton University Press. \$3.00.

In the sense that they operate against the power nominally in control, Yugoslavia's *Chetniks* and "Partisans" may well be termed revolutionary bodies. Although both seek their country's liberation, they represent widely different political philosophies. The same is true of many other occupied countries, although there the movements are still underground and have not yet reached the stage of active revolution.

As the United Nations move into these areas they must necessarily set up temporary machinery of government, as they have heretofore done in Tunisia, Sicily, and parts of Italy. Inevitably, AMG will have to follow a course which at least at times will be counter to the aims of at least one of the local movements and philosophies. Its decisions will be implemented by the very presence of United Nations troops, if not by their employment. As we move further into the homelands the strength of these conflicting local forces will increase far beyond anything yet experienced in our contacts with their external representatives. The greatest understanding, tact, and diplomacy will be required if the released peoples are to establish new governments on a sound, lasting, and peaceful basis.

Although no two situations are ever precisely alike, much can be learned from events of the past. In 1918-1920 Russia was torn by revolution and counter-revolution. The Allies sent two expeditionary forces there: one into Siberia from the east, the other into north Russia through Archangel. Both operations have remained obscure

and little known, and that little has been beclouded by political bias and arguments. Without doubt many mistakes were made. Under the circumstances some of them were inevitable—but the entire "incident" can well help us avoid many errors in the future. Mr. Strakhovsky's account is calm, factual, and objective. It can be of inestimable help to both military and political folk in the not-distant future.

*AL SCHMID. MARINE. By Roger Butterfield. 142 pages. W. W. Norton & Co., Inc. \$2.00.*

Al Schmid is a typical American boy—the kind you find all over the United States. Talking his way out of the hospital on Tenaru River where he had been sent with a badly infected leg, Al got into the big fight he knew was coming. When all of his squad was either killed or wounded, he kept on firing his machine gun singlehanded. A Jap grenade finally caught up with him, exploding in his face, blinding one eye and driving slivers of steel into his other eye and the rest of his body. Invalided home, Al married his sweetheart and was awarded the Navy Cross "for extraordinary heroism and outstanding courage in action." M. K. W.

*FIRST FLEET: The Story of the U. S. Coast Guard at War. By Rex Ingraham. 310 pages; photographs. The Bobbs-Merrill Co. \$3.00.*

In its long and distinguished history our Coast Guard has rendered varied services. In peace-time it safeguards lives and property at sea and on the Great Lakes; its iceberg patrol benefited seafarers of every country. In this war it has been the front line—not only operating cutters, but even manning small boats for Marine landings in the Solomons. Mr. Ingraham gives a comprehensive account of our Coast Guard, with particular emphasis on its activities in this war.

*BATAAN: The Judgment Seat. By Allison Ind. 389 pages; index. The Macmillan Co. \$3.50.*

"The Judgment Seat" necessarily implies the passing of judgment on something. On what, in this case? On blindness, ineptness, and apathy both on the mainland and in the islands; on vision, courage, tremendous effort, and faith on the part of certain blessed individuals; on the heroism and ingenuity of the few, as against the base treachery of the many.

And who is one Allison Ind to speak of such things? Now a lieutenant colonel on Gen. MacArthur's staff, at the time of which he writes he was a company grade officer in a strategic position from which to obtain an over-all picture of developments, and with the training and aptitude to evaluate and record it. He served several months as intelligence officer at Selfridge Field, then in the spring of '41 went out to Manila with "Pursuit" George (later tragically cut down in Australia) and Gen. Claggett. Between then and December he made aerial surveys of most of the islands with which we have since become acquainted, maintained the Intelligence Section at Air HQ in Manila, and as additional duty served as aide to three generals.

*Bataan* is not a rehash of news dispatches or of other books on the period or the area. It is the nearest thing yet to the "inside" story of defects and deficiencies, of bungling and procrastination, of the amazing achievements driven through by the sheer will power and "rightness" of a few.

Naturally it is centered on Air Corps activities. This is to be expected, since these were the things Ind saw and lived. It is helpful, for so much of the fate (or at least the date of the fate) of the islands stemmed from early destruction of our air power there—and also from the astounding feats performed by such pilots and planes as finally got onto Bataan. It is a hindrance in that in the Philippines as elsewhere the Air Corps, rightly or wrongly is beside the point here, seemed somewhat withdrawn into itself rather than inclined to function in full cooperation with the ground forces. Until, that is, Bataan was reached, for there the planeless men mastered infantry weapons and methods to form the bulwark of the defense in the Aglaloma Point area.

*Bataan* is a gripping book. You'll be absorbed in spite of the author's style. He is described as a journalist, but he never uses a couple of 2-syllable words if five longer ones will serve (a single example: "achieve its discovery" instead of "locate it"). It is probably picayune to criticize style in as fascinating and enlightening an

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account as this, but the reader should be forewarned—not that he'll have any heavy going, but that the antique art of "fine writing" has again raised its head. For real meat and solid worth of content, I thoroughly recommend *Bataan*.

*LAWFUL ACTION OF STATE MILITARY FORCES.* By Edmund R. Beckwith, James G. Holland, George W. Bacon, and Joseph W. McGovern. 188 pages; bibliography; index; supplement. Random House. \$3.00.

Written by Judge Advocate officers and teachers of law, 3 of whom have had military experience, this book defines the powers and duties of state troops and for the first time codifies the rights and responsibilities of militia in war or in domestic disturbances. Quite properly its emphasis is on domestic use rather than action against enemy forces. Comprehensive in scope, it is based upon the Constitution, federal laws, and army regulations, rather than on the statutes of any particular state; it should be useful to the forces of any state.

For the particular benefit of the soldier a paper bound edition is published at \$1.50. It contains the text but not the supplement of annotation on the law, topical summary of rights of officers and men, and suggested forms.

*THE LION RAMPANT.* By L. de Jong and Joseph W. F. Stoppelman. 346 pages; appendixes; index; photographs; endpaper maps. Querido. \$3.00.

This story of Holland's resistance to the Nazis is a human chronicle replete with the stubborn Dutch spirit that through the centuries has become a proud tradition of the country.

Nazi subjection of small European countries has become an old story—Current history has accorded each successive political casualty a brief day in the headlines and retrospective mention from time to time, but it cannot pause to examine the detailed processes of blitzkrieg conquest.

Free peoples may well wonder just how such a thing is accomplished within the overall fact of invasion. How does civilian

subjection become operative? How is its machinery set in motion? What are the personal reactions of a proud, liberty-loving people suddenly overwhelmed by a treacherous enemy?

The authors answer these questions in vivid detail that indelibly impresses the hard reality of Holland's experience on the reader's mind. From the shameful attack on Rotterdam through the grim period of the country's reorganization under Nazi control the account is elaborated by descriptions of the methods employed and the results obtained.

The enemy's seemingly casual penetration into government and industry affording access to Holland's economic resources, clumsy efforts to flatter and cajole the people into voluntary subjection, and countless other subterfuges, have not deceived the wary Dutch. The people fight on by whatever methods they can devise, risking their lives, serving continual notice by their attitude that they will never relinquish their certainty of the country's eventual freedom. F. E. J.

*THE JAP SOLDIER.* 125 pages; illustrated. *The Infantry Journal.* 25c.

About pocket size, this book gives a pretty good idea of the Jap soldier, his origin, training, equipment, and weapons. Unfortunately only a few of the many photos are clearly reproduced.

*DER FUEHRER: Hitler's Rise to Power.* By Konrad Heiden. 774 pages; index. Houghton Mifflin Co. \$3.00.

This is the fourth book that Konrad Heiden has written covering Hitler's rise to power. This quadruplication of effort has certain advantages in that each book contains something new, but it has the disadvantage that the fourth book is so long and so full of details that it is difficult to extract any definite picture.

Briefly, Heiden believes that Hitler is not the creator or even the leader of the Nazis. He is the tool of the men who founded the Nazi party: the 200,000 field and company officers of the old German army who drifted around Germany after the war, brooding, dissatisfied, intent on overthrowing the degenerate republic so they could all have jobs again and plan another glorious war. They knew they had

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to have someone who could stir and rally the workers and the great middle class to their banner. They needed a mouthpiece. "An officer wouldn't do," someone told them, "because the people don't respect you any more. Best of all would be a workman in a soldier's coat and with his tongue in the right place. He needn't be very brainy; politics is the most imbecile business in the world. But he must be a bachelor, for then we shall get the women." Hitler fitted the bill perfectly. The rest of the book is devoted to the rise of Hitler and the Nazis. It stops with the blood purge of June 1934, which made Hitler undisputed master of Germany.

Despite this thesis of Hitler being a figurehead, Heiden apparently has a great admiration for him and his achievements, and for pages he searchingly analyzes Hitler's soul trying to explain the reasons for his genius. This contradictory approach makes *Der Fuehrer* a difficult and sometimes a dangerous book to read, because in describing why Hitler could come to power Heiden repeats many of the favorite assertions of the German propagandists: "Like two daggers, Poland and Czechoslovakia thrust into Germany, menacing Berlin at a distance of less than 140 miles"; Germany was forced to live in "frustrated self-determination"; etc.

Heiden also leans heavily for some of his conclusions on what he thinks Hitler was thinking. This "fiction-biography" treatment doesn't particularly strengthen some of his conclusions. Despite the publisher's assertions and many hints from Heiden, the book doesn't contain "sensational" new material, or anything that anybody else did not have access to. It is largely a rehash, with some new meat added, of Heiden's previous three books on the subject.

Nevertheless, if you haven't read the other books, and are more than casually interested in the political, economic and sociological reasons for Hitler and the Nazis this book is recommended—chiefly because there probably won't be anything better written until the war is over and the archives have been opened.

R. G. M.

*ITALIAN DICTIONARY FOR THE SOLDIER.* By Frank Heinus. 218 pages. *The Infantry Journal.* 50c.

*ITALIAN SENTENCE BOOK FOR THE SOLDIER.* By Frank Heinus. 92 pages. *The Infantry Journal.* 25c.

Self-pronouncing, this little pair of books will slip easily into pocket or musette bag for ready study or reference.

*PRIVATE BREGER'S WAR: An Album of Cartoons.* By Dave Breger. 124 pages. *Random House.* \$2.00.

Dave Breger kept right on cartooning when he entered the army. As you doubtless know, he created a brash, non-conforming private of his own name. His drawings are so pointed to the army and so utterly authentic in background and spirit that this collection just hits the spot. For some months now it's been "Lieutenant" instead of "Private" Breger, but nary a change is there in the sort of things his pencil-child does.

*TARAWA.* By Robert Sherrod. 151 pages; casualty list; endpaper maps. *Duell, Sloan & Pearce.* \$2.00.

Tarawa was historic—not the atoll, but our Marines' magnificent capture of Betio islet, its key. Their percentage of casualties was the greatest ever suffered, whether you consider them in the aggregate or with respect to the action's brief time. But this is not to indicate any symptom of defeat or lack of leadership. On the contrary, in taking this important Jap stronghold our losses were much lighter than those on Guadalcanal. And our total casualties (killed and wounded) were only a quarter those of the Japs (all but a slight handful killed).

This was a frontal, sea-borne attack of a strongly fortified island. It was a storming operation, and the bitter fighting was of hurricane proportions. Mr. Sherrod was present throughout as a war correspondent, and his book—written while the event was still fresh in his memory—is detailed, complete, enthralling.

From it the reader gains much. Above all shine the courage and sheer guts of the "devil-dogs," both officers and men. Jap fortifications and methods, the patience of their snipers, and their fanaticism are made clear—not in any pedantic fashion, but as a proper part of this rounded account. Equally important is the intimate picture of how our own troops must operate through the maze of fire which will face them elsewhere even as it did on Betio.

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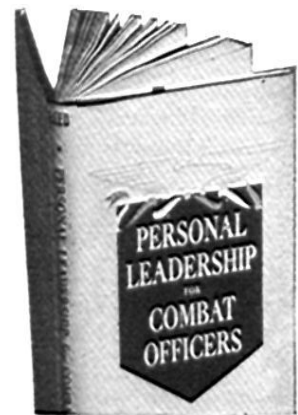
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*COME OVER INTO MACEDONIA.* By Harold B. Allen. 308 pages; index; photographs; endpaper map. Rutgers University Press. \$3.00.

A blueprint for the rehabilitation of unsettled peoples is presented in Harold B. Allen's informative book, based on his experiences in Macedonia from 1928-1938. For those who contemplate the problem of resettling the world's war-harassed populations, there are substantial ideas and suggestions to muse over.

When Mr. Allen, a Director of the Near East Foundation, first journeyed to Macedonia, his sole idea was to administer Near East Relief and assist the Greek Government in its efforts to resettle the near million destitute refugees forced to migrate from Asia Minor in 1922. Soon the relief idea was superceded by a program of education and rehabilitation administered by the Near East Foundation in cooperation with the Greek Government. Basically simple, keyed to the capacities and needs of these peasant people, to whom the simplest American comfort was unknown, the program stressed the improvement of Home, Health, Agriculture, and Recreation. Naturally it was necessary to proceed slowly. The difficulties of language, religious sanctions, poverty, superstitions, and lack of education had to be breached with the tact of a diplomat.

For the purpose of administration, Macedonia was divided into districts, with trained native representatives journeying from one to the other instructing and later supervising the peasants until centers were established in several of the larger towns. In each undertaking the fact was stressed that America was in Macedonia not to distribute charity, but to aid those who desired to improve their crops and their home.

Throughout the book are lively anecdotes of an American's experiences in surmounting the barriers of a strange tongue, age-old customs, and antiquated methods of travel, as well as many personal stories of Macedonians who benefited from the Near East's educational program.

In summation, *Come Over into Macedonia* demonstrates the nature of the responsibility we face—to help the liberated peoples to help themselves. C. P.

*MAP READING FOR THE SOLDIER.* 101 pages; illustrated. The Infantry Journal. \$1.00.

For self-teaching, this lively text should be especially useful.

*WAR AND POSTWAR ADJUSTMENT POLICIES.* By Bernard M. Baruch and John M. Hancock. 131 pages. American Council on Public Affairs. In cloth, \$2.00; paper edition, \$1.00.

Bernard Baruch's most recent contribution to the public welfare is his analysis of "reconversion" problems and his recommendations as to how best to handle them. When first released to the press it was quickly scanned and promptly misinterpreted and distorted by some prominent persons who were carrying on their private little political wars. First impressions are usually the most lasting, so unfortunately Mr. Baruch's report got off to a rather bad start.

It is therefore especially fitting that the text of this official report and related documents is made generally available in permanent book form. The problems dealt with are of concern to every citizen. They deserve study. Mr. Baruch's sound analysis and suggestions are of the greatest importance in this connection.

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