

The
FIELD ARTILLERY
Journal



DECEMBER, 1943

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Under W.D. Circulars 401 (Dec. 10, 1942) and 215 (16 Sep. 43) we have the following restricted manuals for sale to officers and enlisted men. NOTE CAREFULLY these points:

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9-330	155-mm Howitzer Materiel, M1917, M1918, and Modifications	30e
9-331	155-mm Howitzer M1 and 155-mm Howitzer Carriage M1	30e
9-345	155-mm Gun Materiel, M1917, M1918 and Modifications	35e
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The Field Artillery Journal

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

DECEMBER, 1943—Vol. 33, No. 12

OUR COVER this month clearly shows that echeloning can't always be practiced, that sometimes positions resembling those of '61 must be occupied. The rocky district around Mt. Etna, with its walled-in roads, left this British battery (troop) no alternative but to use this narrow lane. Note, however, how all advantage is taken of the protection of wall and buildings for ammunition, equipment, and trucks.

THERE IS A SHORTAGE of truck tire casings, and the army as well as civilians must practice the utmost preventive maintenance. Only a limited number of new truck tires are available for issue to the army in the zone of the interior. This means your present casings must receive every consideration. Be sure you use correct inflation, make thorough inspections (with proper follow-up), and require careful operation. This program must start with the drivers, and continue up through all grades and echelons.

ALL OFFICERS' ATTENTION is called to the facilities offered them gratis by the Officers' Service Committee in New York. With headquarters in the Hotel Commodore, it will not only ease your visits to that area, but will save you money and make your leave as interesting as possible.

Hotel accommodations will be found for you, at reduced rates. Tickets for the theater and other entertainment are available at considerable reduction. By obtaining a special card from the O.S.C., you will save part or all of cover charges, etc. Guest cards are available to nearly every club within the "greater New York" area. Your mail will be received and held pending your arrival. Special dances, lunches, etc., are arranged frequently for your pleasure.

ERRATA NOTE: On page 842 of the JOURNAL for November, 1943, muzzle velocity of the PAK 40 should have appeared as only about 2,600 f/s, and model number of the French "75" on PAK 38 carriage should have read "PAK 97-38."

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General McNair's Christmas Greetings

TO THE OFFICERS AND ENLISTED MEN OF THE ARMY GROUND FORCES:

Our third War Christmas is here. Our first one plunged us into a grim defensive battle on all fronts. With our meager shipping we rushed our partly trained troops here and there in a desperate effort to close the gaps as best we could. We hung on. German submarines were sinking our ships within sight of our Atlantic Coast.

Our second War Christmas found us invading Africa and striking back in New Guinea and Guadalcanal. We had the measure of the Japanese Navy, but German submarines still were inflicting heavy losses on Allied shipping. The worm was beginning to turn, but not too fast nor too fully.

This Christmas we really have much to cheer us. We are conducting successful naval operations in both the Atlantic and the Pacific. We have the mightiest battle fleet ever known, and it is growing. Military operations are in progress in nine theaters all over the world. Africa is rid of the enemy. We can strike on land and sea wherever we elect. We have the initiative. The enemy is on the defensive everywhere. Our superiority is becoming more decisive month by month. One third of our army is overseas, and shipments are being speeded. Victory may not be in sight, but it is certain.

The soldier's Christmas during war perhaps cannot be too merry in the usual sense, but everyone can be proud of America's war effort, and proud of being a fighter in the biggest and finest Army we have ever had.

I have watched our war Army in training for over three years. My admiration for the American soldier increases all the time. I believe in him, and am certain that, led properly, he is invincible in battle.

My best wishes to you all, and my gratitude for your devotion and fine accomplishments.



Medjez-el-Bab afforded OPs 'most as effective as "grasshopper" planes.

DIRECT-SUPPORT BATTALION S-2 IN ACTION

(From experience gained in the Tunisian Campaign)

By Lt. Col. Percy W. Thompson, FA

Experience in the North Africa Theater showed that the bulk of the information received by Division G-2 came from the artillery observers. Intelligence so gained had the advantages of speed (afforded by the comprehensive system of communication established and maintained by the artillery) and of complete coverage of the division front. But considering the lack of intelligence personnel to assist the Battalion S-2, the problem of collecting, evaluating, and disseminating this information was not easily solved.

THE OBSERVER'S REPORT

Observers made their reports orally direct to the FDC, at the time of making the observation. No observer was required to make any written report or take any notes, except under the unusual circumstances that he was out of communication with Battalion or Battery. The report made orally direct to FDC was written down by a clerk specially detailed to that duty and called the S-2 clerk. An oral report had the advantage that the observer could concentrate his attention upon the area being observed and thus give a continued description of enemy action.

Observers were trained to report:

- (1) All enemy activity observed.
- (2) Number of units (individuals, vehicles, tanks, etc.).
- (3) Location of activity (by coordinates, with respect to a numbered concentration, or by polar coordinates from a reference point).
- (4) Direction of movement or nature of activity reported.
- (5) Whether or not he desired to fire on the target observed.

Note that the S-2 clerk placed the time of the report on his log form. In the column "place coordinates," the location of the

reported event should be translated into coordinates by S-2 or his clerk. If fire was delivered, the adjusted coordinates were entered in this column later.

An observer must be trained to report all activity seen insofar as he is physically able to do so. Often he will observe the activity of one or two individuals, which alone do not make a profitable artillery target but are a valuable indication of enemy location and indicate areas that need to be kept under constant observation. The decision to fire or not to fire in any case is the responsibility of the commanding officer, and is generally executed by the executive or S-3 under policies laid down by the CO.

At the end of a fire mission the observer was required to state the results of the fire, not a mere "mission accomplished." Examples of such reports are, "neutralization" (in case of counterbattery), "destruction of _____" (when material damage is observed), "dispersion" (in the case of enemy foot troops or vehicles), "fire or explosions" (where fires or explosions were set on enemy vehicles, dumps, etc.).

ACTION OF THE BATTALION S-2

The Battalion S-2 supervised the work of his clerk at FDC. He evaluated the reports received and if necessary obtained additional information from the observer, taking care not to interfere with the progress of the fire mission based on the report. He would then 'phone the information so obtained to Division Artillery S-2 and/or S-2 of the supported infantry regiment.

In a defensive situation more or less routine enemy action observed within enemy territory was not immediately reported by the S-2, but was included in the routine S-2 report. This

report included all observations made during the period of the report, whether previously reported or not. In an active sector this report was made twice daily—0600 to 1800 hours, and 1800 hours to 0600 hours. Copies of it were sent promptly to the headquarters of the supported unit, the next higher artillery headquarters, lateral units, and battery commanders.

In offensive operations no written report was made by S-2, but oral reports on important observations were transmitted immediately. An attempt to transmit every item of information would overload the communication system. This is where the evaluation function of the S-2 came into play. In general, items reported were:

- (1) Movements of the enemy.
- (2) Progress of our own troops.
- (3) Localities from which the enemy was offering resistance.
- (4) Shelling (heavy).
- (5) Enemy air activity.
- (6) Important targets of opportunity.

Examples of items not reported immediately but included in the next periodic S-2 report:

- (1) Negative information.
- (2) Work on enemy defense system.
- (3) Normal traffic.
- (4) Movement of individuals and of small scattered parties.

Such information will have value only on collation and study of reports of a large number of units. This must be done at the headquarters of a higher unit.

S-2 reports were attached to the unit's journal for the day made. When no S-2 report was made the record of observations taken by the S-2 clerk was carefully kept and attached to the unit journal.

During hours of darkness the S-2 clerk was not on duty at FDC. The officer on night watch at FDC was made responsible that all observations were properly recorded by the telephone operator, and any necessary action taken.

Examples of reports received during the hours of darkness were:

Flares	Enemy patrols
Shell reports	Surveillance of friendly fires
Incendiaries	

SHELL REPORTS

Another important duty of the Battalion S-2 was the receiving and checking of shell reports and their transmission to the corps counterbattery officer. All enemy shelling in the sector or zone of action was required to be reported. Shelling of battery installations should be made by the battery commander or a battery officer who happens to be in a position to observe shelling. Shelling of areas occupied by infantry can best be reported by artillery observers, who are generally better

able to make the report than are the troops actually being shelled. Shell reports should be as complete as it is possible for the observer to make them; information desired:

- a. Time of shelling (time beginning, time ending).
- b. Y-azimuth of the flash or report of gun(s), with location of the observer (or Y-azimuth of direction of fire noted from fall of projectile).
- c. Area shelled.
- d. Damage done.
- e. Nature of fire—registration, zone neutralization, destruction, etc., and number of rounds.
- f. Number of guns firing and rate of fire.
- g. Guns or howitzers, and caliber.

An outline of shell reported should be noted on the inside cover of the message blank book. Items were reported by letter symbol, not by title. Example of a shell report:

- a. 1105-1108.
- b. Report Y-Az 1600.
- c. Bn OP #2.
- d. Radio demolished.
- e. Harassing—10 rounds.
- f. One gun 3 rds/min.
- g. 150 How.

Enemy artillery fire is an important enemy action and is an indication of his strength; an increase or decrease in artillery activity may give an indication of his intentions. These shell reports are of special importance to the corps counterbattery officer. Combined with a knowledge of enemy calibers and the weapons' characteristics, they indicate the amount of enemy artillery in the sector and the areas in which the bulk of his artillery is located—therefore, which areas should be made the special attention of air reconnaissance and aerial photography.

EXAMINATION OF ENEMY SHELL FRAGMENTS AND FUZES

When time permitted, the S-2 or a trained representative obtained a great deal of enemy artillery information by visiting shelled areas. Examination of shell fragments and fuzes gave information as to caliber, type of weapon used, and strength of the bursting charge. Evidence of malfunction of enemy ammunition (such as duds or poor fragmentation), also unidentifiable fuzes and shell fragments, were passed on to the corps counterbattery officer for further investigation.

OTHER SOURCES OF S-2 INFORMATION

(1) *Questioning of prisoners.* S-2 of the direct support battalion should arrange with the S-2 of the supported unit, for questioning of prisoners. In this manner immediate information of enemy artillery installations may be obtained, also information as to the effect of our own artillery fire.

LOG OF OBSERVATIONS

— FA BN

DATE 29 April '43

SECTOR Dj Meftah

FROM 0600 hrs TO _____ hrs

Item No.	Hour	Place Coordinates	Observation	Fire			Effect	Reported
				OP	Ask	Delivered		
1	0621	301645	Conc 321 500 LL 400 SS; En Btry; will adj	A	√	A-B 120 rds	Neut	Div Arty
2	0701	317638	Conc 397 200 RR 100 φ φ En Strong Pt	B Fwd	√	Bn—240 rds	Taken by our Inf	Regt Div Arty
3	0705	319835	Conc 303 Two men entered farm house	Bn # 1	√	No		
4	0816	319757	Conc 397 100 LL repeat m; counterattack—request bn; will adj	B Fwd	√	Bn—		Regt Div Arty

(2) *Reports from infantry patrols* can be obtained (through the liaison officer) from the infantry battalions mounting the patrols or from the infantry regimental S-2. These reports must be studied and evaluated for information of value to the artillery. Patrol reports from adjacent infantry units can often be obtained by an energetic S-2.

(3) *A study of S-2 and G-2 reports of higher and lateral units* pays big dividends in giving a good general picture of the situation.

COMMAND POST ORGANIZATIONS

It was found desirable to organize the battalion command post into two principal installations—the fire direction center and the command post proper. The latter was the normal position for the battalion commander and his S-2 when at the command post. These two installations should be about 50 yards apart, close enough for easy contact but far enough away that their usual activity will not interfere with each other. The S-2 can keep contact with his clerk at the fire direction center and with the log of observations without disturbing the FDC, but should do all his other work (such as 'phoning in special reports, conferences with the battalion commander and others) at the CP tent or dugout.

SITUATION MAPS

S-2 kept two situation maps in the CP tent. A general map showed the general situation as far as possible. It was found quite possible to keep a fairly good up-to-date general situation map from division and corps G-2 reports and an occasional check with the division G-3. A background knowledge of the general situation is of great value to the battalion commander in evaluating the local situation and in anticipating future action.

A large-scale intelligence map of the local situation was also maintained by the S-2 at the CP tent. This showed the existing situation at a glance, in so far as it was known. It included the location of all OPs, firing battery positions, zones of fire or sectors, and known enemy localities and targets engaged during the past 24 hours. Cellulose acetate covers for these maps are essential.

COORDINATION OF OBSERVATION POSTS

S-2 made a continuous study of the system of OPs of the battalion. As a result he was able to make recommendations to the battalion commander regarding:

- (1) Changes in number and location of battalion and battery OPs needed.
- (2) Additional forward OPs needed.
- (3) Which OPs should be manned by battery personnel and which by battalion personnel.
- (4) Relief observers.
- (5) Which OPs should be maintained on 24-hour watch.
- (6) Use of the survey section as observers.
- (7) Linking of OPs with those of lateral units.
- (8) Use of the organic liaison planes.

CONCLUSIONS

In the combat zone the artillery battalion S-2 becomes a very important and busy person. His duties require close attention to detail, a keen and indefatigable desire to gather in every shred of information, a comprehensive knowledge of the situation, and a good background knowledge of enemy organization, equipment, armament, and ammunition. His activities concern not only his own battalion but have a direct bearing on the amount and value of the artillery information reaching higher headquarters. If the information collected by the observers and reconnaissance elements of the battalion is to be properly evaluated and passed upward in usable form, S-2 must be at the battalion command post during the initial and critical stages of combat. At such times his reconnaissance duties should be carried on by the battalion commander, executive, or assistant S-2.

The survey section is nominally under S-2's control, but in practice it was found that survey was of more particular interest to S-3 so survey was done under S-3's direction. The survey section became available to man observation posts and give S-2 assistance only when the situation stabilized; that is, during a time when he had the least need for their assistance.

The amount of work involved in gathering and disseminating the information obtained by battalion observation required that clerical assistance be found for the S-2. He should be given a non-commissioned officer assistant and at least two enlisted observers or scouts.

PRAISE FOR OUR GUNNERS

(From *The Richmond News Leader*)

Artillerists, like infantrymen, have suffered somewhat in popularity because of the bright light fixed upon the air forces, but fuller reports of what happened in Sicily are vindicating the "long arm." The correspondent of *The London Times*, who wrote the best-informed of all the reviews of operations on the island, gave first place to our engineers, in his appraisal of our army, and then he said: "The writer did not have an opportunity of seeing the Americans in action, but informants whom I trust agreed in saying that they came on a lot during the campaign and were now incontestably a first-class army. No army, even a German, has ever been better equipped, and in addition to their sappers, their artillery work is magnificent. Our own gunners are as good as the next man, but they are glad to go to the Americans for tips, just as the American infantry are glad to come to ours."

Like conditions have prevailed in almost every war. For reasons that never have been studied thoroughly, so far as we know, artillery has been our most proficient arm. The story has been the same from the Battle of Princeton to the campaign of St. Mihiel. Our gunners are superlative in everything but publicity.



German 17-cm guns were distinct thorns during the African campaigns. This one was salvaged by the RA, repaired by an REME unit, and quickly used by the British against its former owners.

We have read with more than usual interest the articles in the March and April issues of THE FIELD ARTILLERY JOURNAL on *The Employment of Corps Artillery*. We received these issues during the days when Rommel was more of a fact than a fiction, and we had only our "book learning" to guide us in the employment of Corps Artillery. Now, with the invincibility of the *Wehrmacht* more of a fiction than a fact, we have experience to guide us and feel qualified to say how Corps Artillery was employed.

We concede that the all important "situation" is the determining factor in military tactics, but we believe that the situation at El Guettar and Mateur was not so extraordinary that it cannot lead to a general conclusion or to a guide for future campaigns.

CORPS

ARTILLERY

How It Was Employed

By Brig. Gen. A. J. Rance

Let us review, then, the situation which confronted the Corps Commander during each of these campaigns and then present his decisions on the actual employment of Corps Artillery.

EL GUETTAR

In reality El Guettar was only half a campaign, for part of the II Corps was employed in the Fondouk battle many miles to the north, with no real action going on in between. Prior to the 26th of March part of the II Corps' missions had been accomplished. We were to push the attack, however, to relieve pressure on the British Eighth Army coming north. Thus the battle of El Guettar developed. The attack was to be on a front of approximately nine miles, flanked by rugged hills, with the Gafsa—Gabes road paralleling the axis of advance.

Confronted with this situation, the Corps Commander disposed his artillery in the following manner:

Fondouk (supporting the 34th Inf Div)—Groupment (under a regimental commander and staff):

- 1 Bn 155-mm howitzers
- 1 Bn 155-mm M1 guns
- 1 Detachment from Obsn Bn

El Guettar—Remainder of brigade:

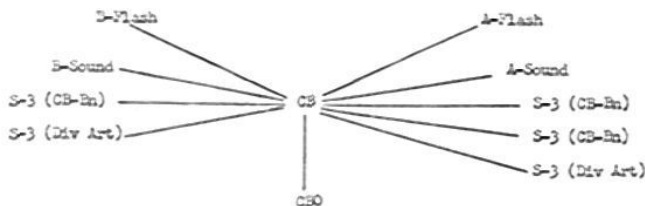
- 1 Bn 105-mm howitzers¹
- 1 Bn 155-mm M1 guns
- 2 Bns 155-mm howitzers
- 1 Bn 105-mm howitzers (SP)²
- 1 FA Obsn Bn (less det. at Fondouk)

¹This battalion had lost its twelve 155-mm howitzers in the Faid Pass battle, and since replacement 155s were not available it was re-equipped with 105-mm howitzers, towed.

²This was an attached Armd FA Bn.

Our artillery drew all praise from both friend and foe in the Tunisian Campaign. Its operations are graphically outlined in this account. Readers are especially cautioned, however, that since the events told here occurred, Tables of Organization of Corps Artillery have been greatly changed; also, Corps Artillery has different tactics from those described. These revisions must be borne in mind when applying the lessons to be drawn from this article, although they detract nothing from either the Tunisian performance or the historical value of this narrative.

The main effort at El Guettar was to be made by two divisions abreast. An armored column had the mission of passing through a gap to be opened by them, and joining with the British forces coming up from the south. To support these efforts the Corps Artillery was disposed as follows:



One battalion of 105-mm howitzers was attached to the division on the right, one battalion of 155-mm howitzers was placed in direct support of the division on the left, and the three remaining battalions were placed in general support of the corps. The battalion of 105-mm howitzers (self-propelled) was given the mission of general support, but had to be able to move out in support of the armored column on a moment's notice. The mission of counterbattery was given to all battalions except the 105-mm howitzers attached to the division on the right.

To obtain the utmost speed in bringing down counterbattery fire, an additional wire net was installed:

The counterbattery switchboard was placed forward, near the center of the battalion positions. All lines to the switchboard were laid by the units concerned. The original plan was to have only counterbattery fire missions go over these lines; it was soon learned, however, that we sometimes receive fire missions which require more speed and more concentrated fire than do enemy batteries: namely, missions against TANKS. For instance, on one notable occasion the CBO concentrated 4 battalions of artillery on a group of 32 enemy tanks. Two days later remains of 16 of these tanks were still there. In view of this and other similar missions the designation of the additional wire net was later changed to "Fire Direction" rather than "Counterbattery."

The normal functions of Corps Artillery were duly performed. As expected, counterbattery led the list of missions fired, but the Corps Artillery was also very active on targets which should normally be taken care of by Division Artillery. With the exception of 54 missions fired by 155-mm M1 guns, practically all of the balance of the total Corps missions fired could have been reached by Division Artillery. Thus, under present TBA, 2/3 of the weight of a Corps Artillery brigade will generally be equalled or out-ranged by Division Artillery; the excepted 1/3 is that of the one 155-mm M1 gun regiment, of course.

Terrain around El Guettar was ideal for OPs, 69% of missions being fired with ground observation and relatively few fired unobserved. Note that the use of the Air OP is inversely proportional to the excellence of ground observation.

Panzers found this terrain to their liking, which accounts for the numerous antitank missions. In fact, in one notable mix with the majority of the 10th Panzer Division, Corps Artillery was largely responsible for stopping a tank attack just on the brink of disaster. Countertank fire was always given precedence over counterbattery fire, even though firing on enemy batteries might be in progress at the time.

34 barrages (preparations) were fired by Corps Artillery. 30 of these, however, were fired by the one battalion attached to the division on the right. At Fondouk, as well as at Mateur later, all available artillery (including 155-mm M1 guns firing at 1/3 their normal range) was used preparatory to the attack.

The principles laid down for the campaign were to hit hard, and to hit often. We did both.

MATEUR

Following the successful conclusion of the campaign in southern Tunisia, the II Corps was next assigned the important task of capturing Bizerte and simultaneously driving east in the direction of Tunis in conjunction with a British advance in the sector to the south. The Corps Artillery moved from a rendezvous near Tebessa to a temporary bivouac near the port of La Calle, crossing the supply lines of the French troops and the British First Army, in less than 24 hours.

The Corps' southern boundary extended roughly in an easterly direction in the rugged hills north of the Beja—Medjez-el-Bab road. Its northern boundary was the Mediterranean (a small detachment of French troops operated adjacent to the sea). This terrain was very mountainous with few roads; OPs sometimes were on hills 1,000 feet above the surrounding terrain. To man such heights, burros were very appropriately supplied to each organization.

The north flank was to be contained by one infantry division operating east from Sedjenane; to them was attached one battery of 155-mm M1 guns. This battery acted on its own, with its own HCO, VCO, computer, etc.

The remainder of the Corps Artillery was to support the main effort. Five self-propelled 105-mm howitzer (armored) battalions were attached to the brigade. Thus the Corps Artillery consisted of 158 guns of 105-mm caliber or heavier, which could lay down over 10 tons of HE per minute during a preparation. And that figure does not include division artillery.

Our main effort, in the southern sector of the corps front, was to be delivered by one infantry division in a 12-mile semicircular sector. This particular sector, taken over by the corps from the British First Army, had been stalemated since the original British drive into Tunisia early in December. The Germans had made an advance in February, but by the time we took over the old line had been reestablished. This stalemate had allowed the British to make an excellent estimate of the enemy situation, which we were able to use to good advantage.

During the initial stage of this attack the Corps Artillery (eleven battalions strong at this point) was all controlled from one headquarters. Fire control was centered at a fire direction center. Different from the El Guettar campaign, the procedure here was that the counterbattery officer, although situated at the FDC, was only responsible for collecting information on enemy artillery. He did not direct any missions, but only passed on his information, leaving to the officer in charge of the FDC the decision to fire or not to fire.

FDC included an S-2 (who kept an up-to-the-minute situation map) and an S-3 (who maintained the current fire capabilities of all battalions). Thus, on receipt of an enemy location a check would be made with our front lines, and simultaneously a plotter on the fire capabilities board would announce the units which could fire on the target and were not otherwise employed. In accordance with strategical artillery

plans the S-3 made his decision as to what unit would fire the mission. We were thus able to bring heavy fire on a target in a very few minutes after it was located. If the mission could be observed by the party giving the mission he would be assigned the battalion(s) to fire. This party would then call the designated FDC(s) over a fire mission line and proceed with the adjustment. The only authorization needed was the concentration number.

The communication system responsible for such a centralized control consisted of a tactical net and a fire direction net. The former consisted of two 12-drop switchboards with lines to corps headquarters, divisions, and battalions. The fire direction net had two 12-drop switchboards centrally located among the battalions of the Fire Direction Center. In addition to these battalion lines, communication was established with each sound and flash section of the Observation Battalion, as well as with each division artillery section. This fire direction net was used only for conduct of fire, intelligence reports coming over the tactical line.

At the beginning of the Mateur campaign these two nets included more than 70 miles of wire, with 40 drops employed on four switchboards. Keeping these nets functioning was a full-time job for the CommO, in addition to his duty as a battery commander. Enemy shellfire made a dangerous job for the unsung heroes who serviced these lines night and day. (Brigade Headquarters wire section sustained three killed and four wounded during this campaign.)

Radio communication, of course, supplemented wire, and immediately went into operation when wire went out. One SCR-177 was used for distant communication. Remote control through the tactical switchboard was employed to great advantage by the S-3.

During the initial preparation, Corps Artillery was called upon by supported divisions for a great deal of fire. As the campaign progressed, our Corps Artillery participated in each preparation.

On the 25th of April another infantry division came into the line on our left flank, followed a day later by an armored division on our right. A battalion of 155-mm howitzers was assigned the mission of direct support to each of these flanking divisions. Three of the self-propelled (armored) battalions were released to the armored division (their organic artillery). The remainder of the Corps Artillery was assigned contingent zones of fire in support of one or the other flanking divisions. The 155-mm gun regiment (less one battery) was able to cover the sectors of all three divisions.

From the original preparations on the 23rd of April until the unconditional surrender of the enemy in our sector on the 9th of May, Corps Artillery pounded the enemy without respite. The terrain not being conducive to tank action, the most important mission was counterbattery. When enemy guns would open up, we would without delay crack down with at least a battalion.

As the campaign progressed the corps counterbattery officer was able to locate accurately and to have data prepared for more than 75 enemy artillery positions. Thus, when our troops could give reasonable direction or location of enemy artillery which might be shelling them and observation was not available, we would immediately sweep all suspected areas in that vicinity. But the enemy moved his artillery often, and it was difficult to do more than neutralize his gun positions.

Between April 22nd and May 1st progress was slow and difficult, enemy strong points falling into our hands one by one. On the 30th of April the infantry had attained a position approximately 24,000 yards from Mateur. At this point a battery of 155-mm M1 guns was moved forward close to the infantry. It fired on Mateur on the 30th of April and the 1st of May. On the second of May the enemy withdrew all along the line, and Mateur was evacuated. This 155-mm M1 gun battery, incidentally, was subjected to terrific counterbattery by the enemy, with an estimated 250-300 rounds (some 150-mm or better) falling in the battery position. Every gun was hit, and one gun had four shells go through its camouflage net. But with this terrific pounding, only one gun was put out of action. (Our combat experience has shown how hard it is actually to destroy enemy artillery.)

After the evacuation of Mateur it was a downhill fight until the last. Our 338 harassing and interdiction missions, many of which were unobserved, proved a decisive factor in the campaign. Reports from prisoners revealed the punishment the enemy had taken. Some prisoners reported going without food for two days or more, re-supply being nonexistent under the continued harassing fires.

A study of the statistics of the campaign revealed that 46% of all missions were unobserved. This was due to the limited visibility on the rugged terrain. Consequently, the Air OP was more actively engaged than at El Guettar and was able to spot enemy guns where terrestrial observation was impossible. The same conditions produced more sound than flash locations.

The end of the Tunisian campaign brought suggestions for changes in TBA and T/O. These have been duly forwarded through channels. We feel that Corps Artillery should be capable of throwing more weight further. Experience has proved that one 95-pound projectile has greater effect than three 33-pound shells. Also, a study of firing data in both campaigns has revealed that the average range fired by the 155-mm howitzers was nearly 12,000 yards, while the guns averaged 20,000 yards; consequently we feel that the Corps Artillery Brigade should include two 155-mm gun regiments and one 8" howitzer M1 regiment, or one regiment 155-mm guns, one regiment 8" M1 howitzers, and one regiment 4.5" guns. That allocation should get us the "furtherest with the mostest."

SUMMARY

	<i>Total Brigade</i>	
	<i>El Guettar</i>	<i>Mateur</i>
Missions fired.....	478	937
Maximum rounds per mission.....	189	257
Minimum range.....	3,000	3,000
Observation.....		
Ground Observer.....	326	388
Air Observer.....	0	30
Sound.....		
Flash.....	58	89
Unobserved.....	94	430
Types of Missions.....		
Harassing.....	35	338
Barrage.....	34	118
Enemy battery.....	142	254
Tanks.....	87	19
Personnel.....	49	65
Others.....	131	143

SNAPSHOTS

By Lt. Col. Joseph R. Couch, FA

Nearly all descriptions written of campaigns and battles attempt to portray the "big picture." To the officers and men who fight in a battle, however, the entire action is composed of a number of small incidents or "small pictures." It is many of these "snapshots," observed and taken part in by small units, that make up that hypothetical mosaic called "The Big Picture."

In southern Tunisia during the latter part of March 1943, Rommel's 10th Panzer Division struck hard at the American forces near El Guettar. During one day of this action we fired 2,100 rounds from twelve 155-mm howitzers. Enemy bombing, strafing, and shell fire were intense, but our forces succeeded in holding the high ground east of El Guettar, and by nightfall the Germans withdrew leaving a large number of smashed and smoldering tanks and vehicles.

Our observers were on a knife-edged ridge overlooking the plain where the German tanks were maneuvering. Most of our fires were battery concentrations using forward observer methods for adjustment. We attempted to place continuous fire on the head of the advancing columns until they turned back or scattered in confusion. In each case this proved successful.

From this action we learned these lessons:

(1) Tanks can be stopped by heavy and concentrated artillery fire.

(2) Each time that their parade-like formation was broken up the tanks retreated. They appeared to be timid and highly confused unless they could maintain their formations.

(3) Continuous and sustained firing is extremely trying upon personnel. We called on cooks, clerks, officers, and nearby doughboys, to help man the guns and ammunition. *All* personnel of a battery should know gun drill.

(4) When they are well dug in troops and materiel are relatively safe from bombing and shellfire.

(5) Wire crews must go into action quickly after enemy bombing or counterbattery fire. Our greatest damage was to wire lines. If the bombing and shelling precede an enemy attack, this reestablishment of communication is vital.

(6) A direct hit on an enemy tank with a 155-mm shell is the world's most beautiful sight.

* * *

In the early hours of the above action a German half-track towing a short-barrelled 75-mm infantry howitzer was seen moving rapidly toward our lines. Before observers could recover from their surprise the vehicle was halted and the crew prepared for action. The gun was then within 500 yards of our OPs, and was under our minimum elevation. One of the observers of my battalion reacted first to the situation by taking charge of a section of infantry mortars 50 yards behind his OP. By shouting a range and pointing out a direction with his arm he got out the first salvo. The rest was easy. Sensing in yards he obtained a bracket, and his fire for effect obtained a direct hit on the vehicle, exploding its ammunition, blowing the howitzer off the road, and killing most of its crew.

Lesson learned: As infantry can use our weapons and adjust artillery fire, so can we profitably use theirs.

* * *

Our infantry was advancing rapidly in a sector in southern Tunisia. One of our batteries was given the mission of making

a rapid occupation of a forward position in order to neutralize enemy artillery fire, which was harassing friendly infantry.

The position was selected by rapid reconnaissance, and it was discovered that navigation of a minefield was required for occupation. Intermittent enemy rounds were falling during the reconnaissance, and enemy shelling began in earnest when the battery moved forward. The minefield was navigated safely and the battery prepared for action. The battery commander quickly established a voice chain to his OP, this being a small hill about 200 yards in front of his guns.

From the OP an enemy battery could be seen firing. Now it was firing at our OP. Then our battery went into action. A quick adjustment was obtained, and the enemy battery stopped firing. Hoping to fight another day he tried to get out. A few of his personnel did escape, but the scattered wreckage of his guns, limbers, and vehicles provided us with much satisfaction.

Lesson learned: Action by a single battery may occur in even a Corps Artillery battalion. Every battery must be capable of independent action.

* * *

The American II Corps had made its flanking movement to the north in the closing weeks of the Tunisian Campaign. Our battalion was in position south of Mateur.

Enemy resistance on a certain hill was stubborn; one attack by our infantry had failed, another was planned. This attack was preceded by a terrific artillery barrage by both division and corps artillery. Our advancing infantry was met by only a handful of badly-shaken Germans, all very anxious to surrender. Nearly 50 enemy soldiers were dead in their trenches.

Lesson learned: Artillery can still lay claim to its title: "THE KING OF BATTLES."

* * *

It was in the Sicilian Campaign. American forces were advancing rapidly through the center of the island.

West of the small town of Villarosa our battalion was in position. One of our observers spotted a German rocket gun in position firing from behind the town. Dusk was settling, and the 6-round salvos fired from the rocket gun in rotation could be seen like Roman candles descending in long arcs upon friendly infantry position to our right front.

Adjustment with one battery was begun. Darkness was almost complete, but the observer "guessed" the salvo as *over*. Making a bold jump he obtained a definite *short* on the next salvo. Further adjustment was impossible, but the observer fired twice through his zone. The rocket gun did not fire again.

When we advanced through the town the following day we found a German rocket gun abandoned, its tubes split.

Lesson learned: The much talked about German rocket gun is as vulnerable to artillery fire as any short-ranged artillery piece.

The Sicilian Campaign was approaching its final phase. Our battalion was in support of an American infantry division advancing along the narrow northern coastal plain of the island.

Near Saint Agata heavy German resistance was encountered. Mines and booby traps were thick, and nearly every bridge was demolished. There the Germans held a high ridge and a huge grey mountain which we called Bald Hill. Their observation was excellent.

On this day enemy counterbattery fire on our position had been heavy and continuous. The S-3 of our battalion noticed that our position received immediate counterbattery fire any time that we fired a mission. Our forward observers searched in vain for the enemy guns. Many profane words were fired in the direction of the hidden battery.

We received orders to fire a preparation for the infantry.

Immediately following this preparation the S-3 ordered our cub plane into the air, and the German battery unwisely chose this moment to resume his counterbattery fire on us. Our air observer spotted four German guns in position firing. A bracket was obtained with our center battery, and fifteen battalion volleys were fired for effect. We could not resist giving our air observer a rousing cheer when he radioed, "Effect excellent, mission accomplished." To a casual observer the ammunition expended on this mission may appear excessive. We have found, however, that one round expended on a definitely-located enemy gun will save many rounds fired later when the same gun cannot be accurately located.

Lesson learned: The cub airplane, discussed pro and con for so many years, is a valuable asset to the field artillery battalion. It serves as a highly flexible and maneuverable OP, thereby overcoming a basic weakness of artillery observation.

VICTOR GRID

By Maj. Neil D. Cox, FA

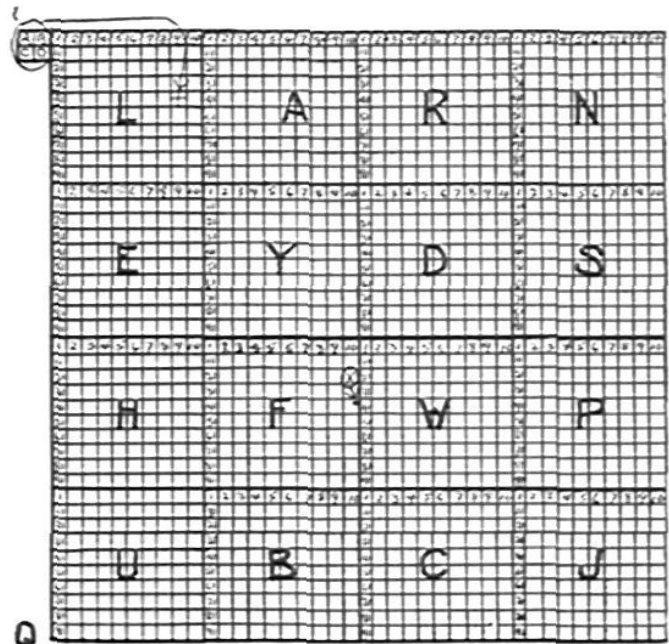
The Victor Grid is a template similar to the accompanying drawing,¹ printed on transparent film for us by an Air Corps photographic unit. The film was then lacquered to resist moisture. It is oriented by placing the point of origin (corner marked "Q") on any intersection of two grid lines, with the left edge parallel with the north-south grid line and the bottom one parallel with the east-west line.

On the upper left corner are four squares within a square. This is a large-scale representation of four subdivisions of each of the small squares of the template, which have to be interpolated. By using these subdivisions a point target may be located within a very few yards, on a 1/50,000 map.

If the point of origin is the 80-20 grid intersection, point "X" (on the drawing) would be read as Q 80 - 20 F 50 B. If the point of origin is prearranged, the coordinates of this point are omitted from the message. Scale of the map is immaterial as long as the sender and receiver of a message are using the same map. If there is a question as to the map used, the sender states the sheet number and the scale of the map in his message; this was rare in our past campaign as all the maps issued to our officers were of the same scale.

As our template is drawn to no standard military scale, it is virtually impossible to decode an intercepted message without both the template and the proper map.

All locations given by use of the Victor Grid and transmitted by radio are sent in the clear. The combined use of a 17-word



prearranged code (committed to memory by all officers) and the Victor Grid permits brief and concise messages to be transmitted quickly without loss of secrecy. Example of a message sent in by a forward observer: "Hollywood Q 80 20 F 50 B Boston 1600-2800"; this might mean *Have established OP at coordinates 842-243. I can observe from compass 1600 to compass 2800.*

¹Letters of the squares on this figure drawing have been altered for secrecy purposes.

Lt. Francis Kernan's article *Speed and Survey* published in the September, 1943, issue of THE FIELD ARTILLERY JOURNAL illustrates a very simple and useful means of determining distance. Lt. Kernan is in error, however, when he writes that ". . . the angles of site must be taken and the distances corrected to the datum plane (multiply by the cosine of the angle of site)." If the bubble in the head of the aiming circle is centered in the usual manner, the true horizontal angle is measured, and the distance computed will be the true horizontal distance, regardless of difference in altitude between the instrument and the base. The only common methods of determining distance which require such correction because of difference in altitude are "slope taping" and "transit and stadia."

UNDER FIRE

By Maj. Edward A. Raymond, FA

The first 105-mm guns on the M7 self-propelled mount to be issued to a combat unit in the United States, were not the first in action in Tunisia. They were, however, among the first. They belonged to a corps artillery group which was assigned to support an infantry division and an armored division at Maknassy. This is the story of that battle from a corps artillery point of view.

The approach march of the group, via Sened, was accomplished through the worst mud imaginable. Right at the start the full-tracked mount, with its outstanding cross-country characteristics, proved itself successful.

The initial rounds were fired from the rear slope of a hill. The mission was registration. The base point selected was a house, from which Italians had been holding back reconnaissance units up ahead. When the 105-mm HE shells started falling, the occupants of the house decided that moving day had come.

MASSED AA DEFENSE

One whole battalion occupied position after daylight, emplacing in an olive grove about 200 yards wide and a mile long. The battery which had registered picked up an enemy gun position, still at extreme range, and knocked it out. Soon the entire battalion was subjected to practically continuous air attack, with Me-109s and Ju-87s arriving in relays every half hour. Every available .50-cal. machine gun and some attached 40-mm AA guns opened up each time, and in every instance the pilots were thrown off the beam by the streams of tracer ahead. Only one or two bombs fell into the whole battalion area. A nearby battalion of the group got a dose of the same medicine. One lucky hit was made on the bomb rack beneath an Me-109, knocking the plane to flinders and strewing bomb fragments and flaming bits of airplane all over a battery position. The executive watched the pilot, his 'chute strapped to his back, come apparently straight down toward him; the body fell not 40 yards away. The lesson the group commander learned was the desirability of massing batteries reasonably close together for mutual AA support.

TAKING IT

Excerpts from the Unit Journal of the right flank battalion show the continuity of strain put on the unit during this action—an action, incidentally, in which the group broke up two enemy attacks and gave invaluable support to a successful counterattack by tanks and infantry.

"28/3. Dug in, widely dispersed. Fired early. At 1503 enemy started shelling position. A half-track, a 2½-ton truck, and a motorcycle damaged. Shelling ceased after ten minutes and air attack started. . . . Enemy fired on battalion to left of position. We continued concentrations to NE. An enemy tank reported destroyed. Battalion displaced 600 yards to vicinity of neighboring battalion after dark. Dug in.

"29/3. Firing started at sun-up. Our position well concealed; enemy trying to adjust to it. A half-track hit, a man killed, two wounded.¹ 88-mm shells landing in soft sand made duds. Enemy registered on attached AA artillery, who evacuated the

position without loss. Battalion fired concentrations all afternoon. Some counterbattery fire returned by enemy without harm. Two attacks on our infantry have been repulsed by our fire. An assembly area containing 50 or more enemy tanks was hit, 2 batteries were silenced, and enemy was driven back.

"30/3. German planes over all night, raining flares. At 0400 hours an air attack with bombs and machine guns. No loss. But for two shells, enemy did not fire this morning. Delivered concentrations.

"31/3. Opened fire at 0430 hours. About 1100 hours enemy concentrated fire on 'C.' Pvt ICI Volk wounded in leg; ammunition trailer hit and set afire. Volk and Sergeant Hamberlin detached trailer before it exploded and drove it to safety. Fired several concentrations in afternoon which were followed by a friendly tank and infantry attack on the hill position we have been blasting. German resistance stiff.

"1/4. At 0400 hours opened fire in support of a daylight attack. AA and machine gun fire deflected enemy planes. 'C' lost an M7 and one man by a direct shell hit. At 1430 hours enemy planes circled under our fire, dropped bombs north of us. Attack followed by a few shells. Enemy planes tried to bomb our ammunition in rear area at night.

"2/4. Did not fire in morning. Enemy shelled us. Lost one man and a peep. Position unchanged.

"3/4. Fired early. Enemy shells landing about 1,000 yards east. Extended telephone to gun positions. At dusk moved about 800 yards south. Vehicles and personnel dug in.

"4/4. Enemy started shelling early. One half-track and two armored trailers set afire.

"5/4. Battalion alerted for expected attack on our infantry. 155-mm gun still in position despite hostile shelling, and active. Fired but were not counterbattered.

"6/4. Fired from 0900 hours continuously to support infantry and tank attack. Enemy 88- and 210-mm shells land in our area. A maintenance half-track hit. Personnel from rear brought up for patrol and outpost guards during night.

"7/4. Mine racks built on half-tracks. Enemy started shelling at 1500 hours, continued two hours without inflicting damage. Several shells thought to be of 150-mm caliber landed in area after dark.

"8/4. Counterbattered for an hour just after daybreak. . ."

Next day the group moved out in its true role, in support of a combat command. Before changing the assignment of the group the Commanding General of the Corps commended the splendid work of the right battalion. The battalion had fired 150 missions despite repeated air attacks, day and night, and

¹First man of the battalion lost through enemy action in the campaign. He was in his half-track, not his slit trench. Another half-track driver, who was in his vehicle when by rights he should have been in his trench, escaped a direct hit on the slit trench. As a rule, however, men should not stay in a half-track under fire: the .50-cal. machine gun should be dismounted and placed on an AA tripod (improvised or issue) with a circular slit trench around it whenever the position is to be occupied for any length of time.

despite over 600 rounds of well-directed enemy fire which fell in the area; it was ready to move out, almost intact, for the next battle.

The left battalion had some hard luck in the same engagement. At 1201 hours on 25 March "B" Battery lost an M7, but the men were all in slit trenches. There were no casualties, even though about 100 rounds of ammunition, in trailer and mount, exploded and 180 gallons of high-test gas were set on fire. The crew had gone on with its business when an 88-mm time shell burst 50 yards over the piece, but when a second round went off 50 yards short, they dove underground. It is just as well that they did. The third round detonated directly over the SP.

At 1707 hours, the same day, another SP was destroyed by accident. It was moving with the Sirocco (a strong SE wind), and flames from the exhaust ports ignited the camouflage net. During the campaign the group also lost two half-tracks from ignited nets. Fireproof impregnation of those nets would have paid for itself many hundreds of times over.

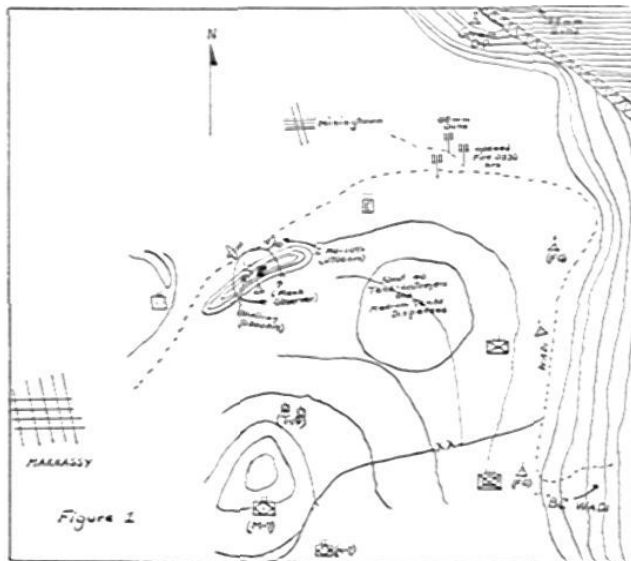
DISHING IT OUT

One of the first forward observation assignments was not handed on to a lieutenant, but carried out by the BC. The party worked forward to the base of a hill and started following a wadi (dry stream bed) up the steep slope. The BC halted his group about two-thirds of the way to the top of the hill and proceeded alone. He looked ahead up a short stretch of the wadi to a right-angle turn around a large rock. From behind the base of the rock protruded the leg of an enemy soldier. The Captain did not turn back to get help—he didn't need any. He crept forward, scouting and patrolling by the numbers, and finally, with Tommy gun at the ready, jumped around the big rock. He is still not sure who was the more surprised, himself or the six enemy infantrymen who were sitting down resting with their arms beside them. The BC had them covered. He alarmed his men considerably as he drove the prisoners ahead of him, back down the wadi. Then he returned to observe from the hill.

The writer makes a practice of asking a dozen or two of the men of a battery the name of their battery commander. The expression on their faces, their manner of reply, tell volumes. He has never seen elsewhere quite the reaction that he got in this battery.

TEUTONIC THOROUGHNESS

The left battalion position was behind a hill near Maknassy, supporting infantry to the east. Forward observers were up with the infantry, and to the north a flank observer was stationed in a stone power plant on the crest of a ridge (see sketch). Between the battalion and Mining Town were two batteries of T-19s (105-mm howitzers on half-tracks) and a platoon of engineers. On the forward slopes of the ridge were about 40 tank-destroyers and medium tanks. The flank observer watched Mining Town for four or five days. There was a German OP on



a much higher ridge beyond the town and, some distance beyond, some 88-mm guns. The Germans gave no sign that they were aware of the American OP until suddenly one day, at 0700 hours, two Me-109s (frequent visitors over the area) plunged down at the building, slamming out fire. They circled the OP twice, banking so tightly that it seemed almost possible to tap the pilots on the shoulder. Neither the observer nor his liaison sergeant had a Tommy gun; neither had anticipated using .45-cal. ammunition against aircraft.

The reason for the visit remained a mystery for several hours. Evidently the pilots returned to the German artillery commander and explained in detail how the FO half-track was parked beside the building, under the eaves, and how slit trenches were prepared—for at 1300 hours a heavy concentration of 88-mm shells came down on the power plant, falling directly on the slit trench in front, smashing the building, and knocking out the half-track with its radio, but not injuring the lieutenant or the sergeant in their slit trench behind the building, next the stout masonry wall.

Intermittent shelling of the OP continued for an hour. Sticking his head out of the slit trench, the lieutenant looked up the wadi past Mining Town and noticed three 88s, so cleverly concealed in some cactus scrub the night before that he had failed to see them all morning. They had been brought in there to fire against the tank-destroyers and medium tanks. This they proceeded to do, pointblank and to great effect. The M7 battalion, without observation, fired but was unable to stop them. The T-19 batteries could not bring fire to bear. Infantry mortars eventually knocked out one 88-mm gun; the other two were withdrawn that night.

The action was typically Nazi, in both its conception and its execution. It was daring, skillful, ruthless, and caused us heavy loss.

HOT WATER

The canteen of a prisoner may look harmless enough, but you can't always be sure of what's inside. For example, surrendering German soldiers have been known to conceal small automatics in these water carriers. This is accomplished by splitting the aluminum container down its entire length, inserting the weapon, fitting the halves together again and replacing the canvas cover. Since the weight of the automatic is about the same as the customary water supply, the ruse is difficult to detect without close inspection—*Army Air Forces*.

Notes on Artillery Air Observation

By Capt. James Edmonds, FA

It should perhaps be stated at the outset that many of the principles and much of the procedure suggested herein vary widely from those commonly taught and outlined as standard. They represent only the views of the author but are, however, based on the experience of this battalion's observers who, in Tunisia and Sicily, totalled probably at least as many missions and as many flying hours as those of any other artillery battalion in the European Theater. There is no thought of quarrelling with the established T/O or T/BA of the air sections assigned to the artillery of a division. Rather is it desired to indicate how, by proper cooperation and coordination, best results can be attained with the materiel and personnel available.

Use of "grasshopper" planes for artillery OPs is so relatively new that the tremendous opportunities which they afford have been insufficiently exploited, even insufficiently recognized. The advantages of this type of observation all too frequently have been more than outweighed by inadequate control, improper technique, and inexperience.

The tendency toward the assignment of new, junior, officers as aerial observers—perhaps on the theory that they can do less harm there than elsewhere—has been definitely reflected in the analysis of results obtained, and is one of the chief evils which must be eradicated in any unit which hopes to have smooth and efficient air observation. It is undeniably true that battle conditions, demanding extra liaison officers and ground observers from none-too-large commissioned rosters, place a heavy burden on battalion commanders and leave them little selective choice. As a result, under present T/Os there will almost always be a shortage of trained and qualified observers available for aerial duty in any given action.

Proper training, however, will increase the number of experienced observers available. Proper technique and proper control will permit the most efficient use of such qualified personnel as can be so used.

In a discussion of training aerial observers for artillery it can first be stated categorically that an observer who is not trained and thoroughly trained is not only of no value in the air but constitutes a menace and a waste of material and time.

It can be said with equal force and truth that it is a waste of time, energy, and ammunition to make any effort to train as an aerial observer anyone who is not already (1) a good artillery terrestrial observer and (2) an accomplished map reader. It is useless to try to teach a man to shoot from the air when he doesn't know how to shoot on the ground. It is silly to expect a man to follow a map from the air when he couldn't on the ground. And it is sheer optimism to suppose that mere possession of a commission, even in field artillery, is a guarantee of thorough knowledge of gunnery or of maps.

Obviously, therefore, officers selected for training as aerial observers should first be thoroughly examined to determine whether they are "good shots" and skilled in map reading. None other should be accepted.

TRAINING

Methods of training will vary with the policies of the division artillery commanders, the time, the areas, terrain, and

facilities available. Only suggestions of more or less general application can be laid down. Definitely, selection of instructors should be made with the utmost care and the training program outlined by them should be worked out in the fullest possible detail to cover all phases from basic flying instruction to completion of the observation course by intensive aerial firing.

Certainly a brief period should be allowed for "conditioning" flights in which the candidate will learn the maneuvers of a plane, its flight characteristics, and how physically and mentally to accustom himself thereto. These preliminary hops should gradually merge into orientation flights during which the student will learn the differences in the appearance which varying terrains present when viewed from the air. He will learn to judge distances from various altitudes and will gradually acquire the knack of tying in ground patterns as seen from the air with the map depiction of those same patterns. His aerial map reading will begin to be automatic rather than studied.

Here intensive training should be started in point identification. The observer must be taught and must learn how, speedily and accurately, to locate on a map an indicated point on the ground as well as the easier task of spotting on the ground, from the air, an indicated map point. The length of time necessary to teach this will vary with each individual. Highly skilled instruction is necessary but no candidate should be considered qualified until he is thoroughly competent in this most important phase of aerial observation.

Observation of maneuvers and emplacements of friendly troops from normal altitudes and distances will aid the development of the all-important knack of target identification. Talks by battle-trained observers and study of aerial photos, obliques in particular, will help. The student must be shown how to search an area for the usual evidences of enemy batteries and other emplacements. He must be told their customary tactical dispositions. He should be taught to "spot" a gun's flash and how, hastily but accurately, to pin-point it on the ground as a preliminary to locating its position on a map. This he will learn is vital, because of the many times flash will be seen but once while the gun itself is difficult, even impossible, to detect.

When this stage of training is successfully completed, and not until then, the student will be ready to begin actual observation and conduct of fire from the air. First he should be shown burst patterns, should learn what smoke, high explosive, ricochets and time fire look like from the air. He should learn the appearance of a normal sheaf and become accustomed to judging bursts and range and deflection deviations from widely varying angles and altitudes. He will learn the differences between range bounds of 50, 100, 200, 400, and 800 yards as viewed from a plane,¹ and should soon be able to fix the GT line on the ground and in his own mind regardless of the banks and turns he may be making. He will begin to estimate times of flight and when to indicate to his pilot the approaches desired to permit of best observation.

¹Note, however, that against flat terrain this can not be done from low altitudes.—Ed.

Once all this has been mastered the actual conduct of fire will prove simple. The very few variations from normal Forward Observer procedure and technique will present no difficulties to the student who, as he must, already knows how to shoot.

In the final analysis, of course, only actual missions, in combat, will produce skilled and experienced observers. Completion of a course such as has been briefly sketched will, however, develop trained officers who will readily, quickly and smoothly assimilate battle experience.

The artillery of any division should have a constant available pool of from six to twelve observers so trained, in addition to such pilots as may also be artillery officers. (Experience has shown conclusively, incidentally, that it is almost impossible for a pilot to fly a plane in combat and observe for artillery purposes at the same time,² hence no reference is made to efforts which have been made to combine the two functions.) Whenever possible training should be carried out to increase this nucleus or to provide for replacements to maintain such a quota.

The term "pool" as here used does not imply a separate group, detached from the individual battalions. What is actually meant is that there should be at least two, preferably three, qualified aerial observers available at all times within each battalion.

CONTROL

There is considerable difference of opinion as to the proper administrative and tactical control of the division artillery air sections and of air observation as a whole. Some commanding officers have felt that control should be entirely vested in Division Artillery Headquarters and have so ordered, battalions being required to obtain permission to use their ships on combat missions. Others have left full control with the individual battalions, exercising not even surveillance of air operations.

Both systems have their ardent advocates and their equally violent opponents. Both present certain advantages and certain marked, obvious disadvantages. In the one cooperation is lacking, in the other coordination. Since both cooperation and coordination are essential it is the studied opinion of this writer that a method of control which is really a compromise between the two extremes will give greatest efficiency and best results.

Such a method, under normal operating conditions, would "pool" the air sections for administrative purposes. (Clearly any section could and would be attached to its own battalion if and when distances or tactical considerations dictated.) A single division artillery landing field would be used, thus simplifying supply and maintenance problems. Administrative command would rest with the Division Artillery Air Officer, the senior pilot of the ten normally assigned.

Tactical control, in a general sense, would be exercised by the S-2 section of Division Artillery Headquarters, tactical command being vested preferably in the S-2 himself or in the senior observer, as the direct representative of the commanding general.

Observers for a given operation would be assigned from each battalion, there being a minimum of six (with at least one from each battalion) on permanent duty at the landing field for the full time the division is in action. Four of the observers (one from each battalion) would remain primarily agents of their battalions, would fly their own battalions' planes on specific

missions for those battalions. They would maintain constant contact with their own command posts and be instantly available for flights on orders therefrom.

One of each battalion's planes would always be available for battalion mission to be flown by these observers. Its radio channels would be those of Division Artillery and of the individual battalion. Communication normally would be direct from plane to battalion FDC.

Battalions would have the right to use such planes with their designated pilots and observers at any time and on any mission, without recourse to higher authority. Battalions having specific fire or reconnaissance missions within their zones of operation would merely order up their assigned plane. Division Artillery S-2 would be notified of the mission from the field, and a report thereon would be submitted not only to the battalion but, upon return to the field, to Division Artillery as well.

Other observers than these four detailed at the division artillery landing field, would be pooled for the normal use and missions of Division Artillery Headquarters. They would use the planes of Division Artillery or, in emergency, the extra battalion planes available.

Such a system would enable Division Artillery Headquarters to have both planes and observers on call at any time, would give it sufficient control to guarantee coordination of effort and the elimination of the possibility of duplication of missions, would keep it constantly in possession of all information secured through air observation, and at the same time would obviate the frequent delays experienced in obtaining or firing missions through Division Artillery channels alone. It would give the battalions immediate and efficient air observation, as and when needed, without the sacrifice of unified command.

EMPLOYMENT

Tactical employment of the air sections, under this method of control, would follow a fairly set pattern which should probably depart somewhat from the form established by general policy.

It is normally laid down that *all* air missions shall be specific, that *none* shall be of greater duration than 20 minutes and that *no* planes shall venture beyond friendly front lines.

Unhappily, experience has shown that rigid adherence to these rules would so severely restrict aerial observation in combat as to make it useless or impossible much of the time.³

³On this point an experienced artillery observer writes:

"Actually there is good reason for each of these [safety] rules. The first tends to protect the airplane from unnecessary hazard on account of being sent up on vague and ill-considered missions.

"The second is an obvious safeguard against enemy fighter planes which might be dispatched from nearby landing fields after our plane is in the air. British reports from North Africa stated that at least 3 of their planes were lost in just this manner. Unless a serious attempt is made to shorten the length of missions we shall find each artillery airplane flying continuously throughout the day or such part thereof as is physically possible. It is a fact that by endeavoring to shorten the duration of missions we have been able to achieve under training conditions an average time per mission of approximately 8 minutes from take-off to landing, a feat never even remotely approached prior to the institution of organic air observation for field artillery and the adoption of the operating methods now in general use.

"The third rule, against venturing across enemy lines, has paid like dividends, and without doubt our losses in battle have been far less than they would have been had we not imbued all ranks with the idea that such use was, at least, exceptional.

"It is pertinent to point out that Capt. Edmonds' experience has been,

²This confirms the theory of those who developed the use of light planes for artillery OPs.—Ed.

Battle targets, unfortunately, are usually by no means so cut and dried, so clearly marked, and so readily identifiable as those of our training grounds. Nor are channels of communication always so unhampered. Nor do conditions of visibility, whether of terrain or weather, by any means always approach the ideal.

Even those missions which are called "specific," when assigned to air observers, almost never definitely locate a target. It can be stated in fact as a precept, that any target which can be sufficiently well identified on the ground to permit of positive description to an aerial observer should be fired upon from the ground and not from the air.

Normally a "specific" mission will be assigned by Division Artillery or by a battalion as "a battery firing from the vicinity of 56.5-02.4" or "a gun firing from behind Hill 347" or "mortars at 98.1-45:6," all of which merely indicate to the experienced observer that the targets are suspected to be near the indicated areas, whether they have been "identified" by the infantry, "located" by observed smoke, or "spotted" by sound or flash. In any case the aerial observer must first climb to a reasonable altitude, find the designated point, search the ground nearby for the target, clearly and positively identify it, and then (and only then) bring fire upon it. In rare instances this may be accomplished within 20 minutes, but it probably will not. It may be possible from a position behind the front lines of friendly troops, but quite possibly it will not.

It may or it may not be advisable to continue to attempt to accomplish a given mission beyond the set time limit and beyond the normal safety line. Battle conditions, the importance of the target, and general tactical considerations will determine both the necessity and the dangers. The judgment of skilled observers and pilots should be relied upon to weigh the one against the other for the final decision. No set rules can possibly be applied generally.

If this be true with the so-called "specific" missions it is doubly so when, as so often must happen, an aerial observer is sent up to endeavor to locate an enemy battery which, perhaps, is firing on our troops and whose location is known only vaguely, if at all. In such cases an observer must search literally miles of enemy terrain for flashes, for smoke, or for some other indication of the presence of guns, howitzers, or mortars. Time in such missions cannot be limited nor can any safety line be fixed. An observer from this battalion, for example, spent six hours on two successive days during one battle, in an effort to spot one particular enemy battery—and even then he was finally successful only because he flew far beyond his own front lines.

It is argued that staying in the air for more than 20 minutes

had under ideal conditions of friendly air superiority. The principles under which our pilots and observers are trained, on the other hand, envision an operating procedure which is applicable under less favorable conditions. No one could have known in advance that our air OPs would have had such an easy time in Tunisia and in Sicily. No one knows now that they will continue to have such an easy time through the campaigns of the future. The rules we have taught are generally sound; like all rules they are to be broken when conditions justify.

"It seems most pertinent to observe at this point that the rules mentioned were not considered so sacred as to prevent the planes from being used in a logical manner under conditions obtaining at the moment. Capt. Edmonds' own testimony verifies this as do reports from other observers. The effect of the rules we have taught has been to give all ranks a proper conception of the risks involved; it has not served to prevent a full exploitation of the capabilities of the artillery observation plane."

and flying beyond advanced friendly installations will jeopardize the safety of planes and crews. This is to a certain extent true. Normal precautions, careful training, experience, and constant contact with ground observers who will signal the approach of hostile planes will, however, considerably reduce the risk involved. And, further, there seems no good reason why artillery planes, pilots, and air observers should in cases of need be considered any less expendable than air corps materiel and personnel or artillery forward observers.

If our infantry, for example, is being shelled by hostile artillery which is masked from ground observation and if those guns can be located and silenced only by flying for two hours and going beyond a hill mass known to be in enemy hands, it is or should be the job of the artillery observer to stay in the air the required time, to fly beyond that hill, and silence those guns—even though some danger be attached to the mission.

Once a mission has been assigned to an observer, failure should be reported only after every conceivable means of accomplishing it has been exhausted—every conceivable means, that is, consistent with the importance of the mission. This requires of course that the observer always be fully informed as to both the character of his mission and its relative tactical or strategic value. It should be the function of the tactical command to see that this information is available and is obtained.

Normally, specific fire missions should be assigned to and flown by the observers within whose battalion zones they fall, whether these missions be called for by the battalions or by Division Artillery.

General missions, involving observation over a wider front, should be assigned to those observers who are flying for Division Artillery.

In the opinion of this writer reconnaissance and patrol missions are additional functions of observers for Division Artillery, and should be assigned far more frequently than has been the general usage in past operations. Roads, trails, lines of communication and supply, position areas, enemy demolitions, even enemy installations and assembly points can be scouted by trained artillery aerial observers with reasonable safety in any approach movements or pursuits. Information thus secured can be of inestimable value not alone to the artillery and its supported troops, but to higher headquarters. Actually such reconnaissance can be of far more value than aerial photographs, since it can be constant and its results are immediately known and can be instantly acted upon.

This being true it seems a reasonable conclusion that artillery aerial reconnaissance within the division should be constant, at least as constant as weather and actual combat conditions permit. This means that, given favorable conditions, at least one plane from the division artillery air sections should be in the air on patrol at all times during the daylight hours. At least four others, one for each battalion, should be immediately available for stated missions. The other ships and observers should be in readiness for relief patrol or supplementary reconnaissance.

Reconnaissance missions should locate routes and areas and report thereon, giving information, too, on such enemy activity as is observed. Patrol planes, alternating after fixed flying periods, should cover the whole division front, moving in wide sweeps behind its lines to spot immediately any increased activity in any sector, pick up the flashes or smoke from hostile artillery, instantly report its location, and, if requested, fire

upon them through Division Artillery channels. Patrol observers should not be asked to search for specific targets, this being the job of the battalion planes and observers who meanwhile should be on call, in constant contact with the individual battalion command posts, and at all times available for any battalion missions.

Obviously an operating procedure such as this requires skilled pilots, and observers who are fully qualified. It demands

the closest cooperation between the S-2 and S-3 sections of the battalions and Division Artillery, and necessitates the maintenance of an efficient communications net, whether telephone, radio or both. Given these basic elements, which can and must be attainable by the artillery of any division, and employed generally along these indicated lines, artillery aerial observation can become a truly important factor in operations of the future.

NAVAL FIRE SUPPORT IN SICILY

By Capt. W. V. Ledley, FA

It was with some surprise that my colleague and I heard we were to be liaison officers with the assault infantry in the Sicilian landing. Quite an unusual procedure for medium artillery, which is rarely in direct support! However, as the plans developed, the experience promised to be most interesting. The infantry mission was to protect the extreme left flank of the main force by landing on the beach directly in front of the town which towered above on a 200-foot ridge, capture the coastal batteries on the left, secure the town, and then await reinforcements.

Several weeks before D-day the navy observers started training the radio operators in the naval fire control code. Although the principles of adjustment of naval fire are the same, methods and terminology differ somewhat. This training was carried out in conjunction with the warships we were to use in the actual operation, which were then lying offshore. To increase mutual understanding, our operators boarded the ship several times and discussed mutual problems with the naval operators. This intensive training and the resultant spirit of cooperation had much to do with the success of our part in the operation.

We feared that our hand carts might bog down on the beach, therefore three extra men per section were added as equipment carriers. After much experimentation, each individual was designated to carry a specific item. Due to the threat of barbed wire, the party to land at H + 5 discarded the cart idea entirely.

We felt that the ideal situation was to have the sections land at half-hour intervals. Because of the priorities on landing craft we had to compromise: the first FO party landed with the regimental commander and the balance an hour and a half later. It was vital to have at least one party in early to signal the cruiser to lift its prearranged fire on the shore batteries when the infantry was ready to assault. In this one respect we failed, since neither rockets nor radio caused the ship to cease firing at the proper moment and our troops suffered somewhat as a result.

The actual landing was far less hazardous than expected. But in spite of all precautions two radio sets were lost before we were established on the beach. This to my mind confirmed the soundness of the planning which provided us with a complete duplicate set of equipment. The only other loss sustained was when our jeep loaded with extra batteries was landed in too deep water.



Our observers early secured good observation in the town itself. Before they had opportunity to bring up their complete sections, however, there was plenty to shoot at. Italian light tanks were approaching town along the main road. Relaying to the base sets, naval fire was brought down immediately. Half the tanks were stopped, but the balance secured defilade from the naval fire and penetrated town. Two were knocked out by bazookas and the remainder withdrew. Since the tanks were not accompanied by infantry, that attack was not considered to be a serious one. That came the next day.

A sizable tank force drove in toward the right of town, apparently attempting to separate the troops within from the rest of the force, while the infantry attacked on the left. Our observer in that sector who had meanwhile secured excellent observation, fired almost continuously during the middle of the day. He was credited with destroying at least a battalion of the enemy. The other observer, until bombed out of his first OP, adjusted both the ship and our own battalion on tanks and infantry with excellent results. At times our ships enthusiastically fired directly at tanks. By the end of that day the most serious counterattack was not only stopped but smashed with heavy enemy losses, thereby securely establishing the beach head.

I feel this was due largely to the excellent naval fire support and to the fact that our own artillery was ashore and shooting long before the enemy anticipated. Our own part in the mission was successful because of the sound staff planning above, long training and experience of our observers and radio operators, and fine spirit of cooperation between the army and navy both before and during the operation.



Summer heat is terrific in parts of the Mediterranean, so this 'phone operator is dressed a la Libyan photos. The battery's CP (FDC) has managed to make itself comfortable, even though established in the midst of rubble.



Firing batteries were dug in, further revetted with sand bags, and covered with camouflage nets. They fired incessantly, at high rate, and so made the bridgehead possible.



Objective lenses of this BC 'scope are fitted with short sun-shades.



PRIMO SOLE

Just below Catania the main road from the south crosses the Simeto River and debouches onto the Plain of Catania, near the little town of Primo Sole. Some of Sicily's bloodiest fighting occurred when Britain's Eighth Army forced the Gornalunga Bridge. It was stoutly defended, and covered by 88-mm guns, but strangely enough was not demolished as one would expect. These views are of the battery (U. S. battalion) of 25-pdrs that supported the final attack.

Primo Sole's Castello furnished this OP with comfort, concealment, and protection from the elements.



An S.O.P. For Conduct of Time and Ricochet Fire

BASIS OF S.O.P.

This Standard Operating Procedure is prescribed for the conduct of observed Time and Ricochet fire using "Air Ground" methods. The observer senses. The FDC or Battery Computer at the Executive's post (when Battery is operating alone) does all computing and gives all commands to the firing battery.

The method of time fire is based on the following steps: Determination of time of burning correction at the beginning of the firing period. Adjustment of impact bursts on the target using quick fuze. Adjustment of air bursts above the target. Time fire for effect.

DETERMINATION OF TIME OF BURNING CORRECTION FOR DAY

After the base point adjustment the FDC (on observer's sensings) brackets time of burning at base point without changing quadrant elevation.

The observer senses rounds as *Air or Graze*. If the first round is in the air he senses it in yards above the Base Point, such as *Air 50 above*. The FDC attempts to place the first round of adjustment in the air, then, by making use of time factors in the range table, adjustment is expedited by determining a time change which will result in a time bracket.

When a 4/10-second time bracket is split, a battery salvo is fired. The sheaf is adjusted on this salvo and adjustment of the time of burning is completed.

<i>Salvo Results</i>	<i>Treatment of Time</i>
2 Air and 2 Graze	Correct
1 Air and 3 Graze	Decrease 1/10 sec.
3 Air and 1 Graze	Increase 1/10 sec.
4 Air and 0 Graze	Increase 2/10 sec.
0 Air and 4 Graze	Decrease 2/10 sec.

On the basis of this adjusted time, the time of burning correction is computed for the K'd base point range. This correction is applied flatly to the tabular time of burning for the K'd range of subsequent targets.

If a base point is not adjusted upon a time correction can be determined by a high burst adjustment. The difference between the tabular time of burning for the chart range to the C.I. and the fuze time used during the adjustment, will give a very accurate time correction.

A time correction is good only for weather and temperature conditions that existed at the time of the determination of the correction. When atmospheric conditions change the correction should be checked and corrected.

INITIAL COMMANDS FOR TIME OR RICOCHET FIRE

After locating a target the observer decides whether Time, Ricochet, or Quick Fuze would be more effective.

If the observer desires time fire he states *Time* in his commands. He estimates the number of yards the base point (or a concentration from which he senses) is above or below the target. If he gives the map coordinates on a contoured map this estimation is unnecessary. If the target is designated on an uncounted map or an air photo the altitude of the target is indicated to the FDC by sensing its estimated altitude above or below a point of known elevation or, in the absence of this, the

A light battalion of the 9th Div Arty developed this S.O.P. over a considerable period. It used this method throughout the Sicilian campaign, with excellent results. No changes were made or even recommended as a result of experiences during that period.

estimated altitude above or below the general lay of the target area.

To obtain time fire commands are given as follows: "Fire Mission. Base Point is 600 Right, 200 short. Time. 20 above (below). Enemy battery. (Request Battalion.) Will adjust." "Fire Mission. Victor 3070 Fox 81 William. Time. Area is 20 below (Hill 230 is 20 above). Enemy battery. (Request battalion.) Will adjust."

If he desires ricochet fire he states *Ricochet* in his commands; for example: "Fire Mission. Base point is 600 right, 200 short. Ricochet. Enemy battery. (Request battalion.) Will adjust."

If he does not specify *Time* or *Ricochet*, quick fuze will be fired. If during a quick fuze adjustment time or ricochet fire is desired, this type fire can be obtained by stating *Time* or *Ricochet* after the sensing.

When time fire is requested by the observer, quick fuze is used in adjustment. When the observer commands *Fire for effect*, the FDC fires time fire as follows:

Time of burning is given to the battery, equal to the tabular time value for the K'd map range (range corresponding to adjusted quadrant elevation less site) with time correction applied. The adjusted quadrant elevation for the target is increased 20/R mils.

One volley is fired, on which the observer senses the number of air and graze bursts, such as 3 Air, 1 Graze. The FDC corrects the time of burning in accordance with the observer's sensings by changing the time of burning as indicated below:

<i>Salvo Results</i>	<i>Time Change</i>
3 Air and 1 Graze	No change.
2 Air and 2 Graze	Decrease 1/10 sec.
1 Air and 3 Graze	Decrease 2/10 sec.
0 Air and 4 Graze	Decrease 3/10 sec.
4 Air and 0 Graze	Increase 1/10 sec.

After this correction is made, time fire for effect is continued.

ADJUSTMENT OF RICOCHET FIRE

When ricochet fire is requested the delay fuze is fired throughout the problem. If ricochets are not obtained during fire for effect, fuze quick is requested by the observer. If rounds are difficult to pick up during adjustment, *Fuze Quick* or *Shell Smoke* may be requested.

A careful study of the terrain in the vicinity of the target should be made both before and during ricochet fire. The FDC will attempt to fire the charge that will give an angle of impact on the terrain in front of the target most suitable for ricochet.¹

¹But note pages 345 and 522 of this JOURNAL for May and July, 1943, concerning the greater effectiveness and broader use of ricochet, than had been generally recognized.



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 IN ITALY (September 21 to October 20, 1943)

At the beginning of the period the Army Group commanded by Gen. Sir Harold R. L. G. Alexander had two armies operating in south Italy: the American Fifth Army (around the Gulf of Salerno) and the British Eighth Army (south of the line Potenza—Bari). They will be considered in turn, in their common mission of driving the German armies out of Italy.

CAPTURE OF NAPLES BY THE FIFTH ARMY

Commanded by Lieut. Gen. Mark W. Clark, the Fifth Army consisted of a British unit on the left and the Americans on the right. It was holding the line:

Capitigliano (4 miles from Amalfi on the road to Naples)—Salerno—Baronissi (exc.)—San Cipriano—Montecorvino—Eboli.

The British had three infantry divisions and one armored division, the Americans three infantry divisions, an airborne division, and one armored division; in all there were 9 divisions.

The enemy consisted of part of the German Tenth Army, with an armored corps of two divisions (the Hermann Goering and the 16th Panzer) on the right; on the left a motorized corps of the 15th and 29th Motorized Divisions, and the 1st Parachute Division serving as infantry. German organizations were below strength, but their morale and equipment were good. As a result of the battles around Salerno the Germans were in course of withdrawing, their left pivoting to the rear on the right which held above Salerno. On 21 September the American right advanced from Eboli to Campagna without meeting particular opposition.

Finding that the enemy was holding further to the right, an attack was ordered on his positions between the towns of Oliveto and Contursi. This was made on the 23d, and resulted in a hard, bitter fight which lasted all day. Evening found the Americans in Oliveto but the Germans still in Contursi. As American possession of Oliveto was too great a threat to Contursi, the Germans (feeling unable to reestablish the situation) abandoned that town during the ensuing night; it was entered by the Americans on the morning of the 24th. Continuing onward against light resistance, the Americans arrived at Calabritto on the 26th.

The British Corps had also attacked on the 23d. They had a very hard fight in the mountains north of Salerno and made only a short advance then and again next day. A general attack was made on 27 September, and this time the British line arrived within 1 to 2 miles of Nocera. It was ascertained that the strength of the opposing 16th Panzer Division was 50% of its prescribed numbers. As the Germans were now practically driven off the mountain range shielding the plain south of Naples, their commander decided not to fight again south of

Naples. Leaving a rear guard, the Germans withdrew that night.

Next day, the 28th, their main body was moving north through Naples. The citizens became excited and imagined that the Allies were just behind and would arrive within a few hours. A considerable amount of disorder arose. Individuals who were armed fired at isolated Germans, others took to looting, many sought to flee. The Germans were busy blowing up key points. In the city were many Italian soldiers who had left their colors, with or without leave, upon announcement of the armistice on September 8th. They had taken arms and ammunition with them. Some of these arms came into possession of irresponsible Italians, including children, and some were used by the ex-soldiers themselves. The Germans took strong action by shooting anyone who happened to be near where some Italian had fired, and they set fire to any building from which they imagined shots had come.

During the three following days the British advanced very slowly. The 15 miles which separated them from Naples was a succession of towns which made almost a continuous one. German rear guards took post in houses, where they were hard to find until they opened fire; to get them out artillery was then generally needed. The inhabitants cheerfully offered their services to aid in locating the enemy. Their enthusiasm at times was a hindrance rather than an aid.

On 1 October the Fifth Army advance reached Naples at 0800 hours. There was no enemy resistance on this day, and the occupation of the great city was without hostile reaction.

The city was not so badly damaged as had been expected. The port area was completely demolished, partly the result of Allied bombing and partly from German demolitions. Ships had been sunk to obstruct access to quays and piers and to block channels. Most of the hotels were destroyed but the business and residential sections had only scattered damage.

Greatest nuisance was the absence of any water supply, due to the sources' having been destroyed—the inhabitants had been forced to drink sewer water. There was no electricity nor gas, and the telephone exchange was shattered. Ordinary conveniences of life were gone. The people were found to be nearly starving, wan and thin from long privation. Armed mobs, in part composed of women and children, were still around. The city was littered with garbage and refuse. All in all, the task of rehabilitating this city was obviously a good-sized task.

Before the Germans left they had removed everything on wheels—automobiles, trucks, carts, and even electric trolley busses. They had taken typewriters, radios, and a vast quantity

of other things, for which they issued requisitions payable at the settlement of the war.

The Fifth Army pushed through Naples, reaching Benevento on the 2d and then the Volturno River, where the enemy was found in position. By the 7th the American Army was in contact with the enemy everywhere along the line. The American estimate was that the Germans had at this date 20 to 25 divisions in Italy, but only 6 of these had been identified in line and 4 of these were now opposite the Fifth Army.

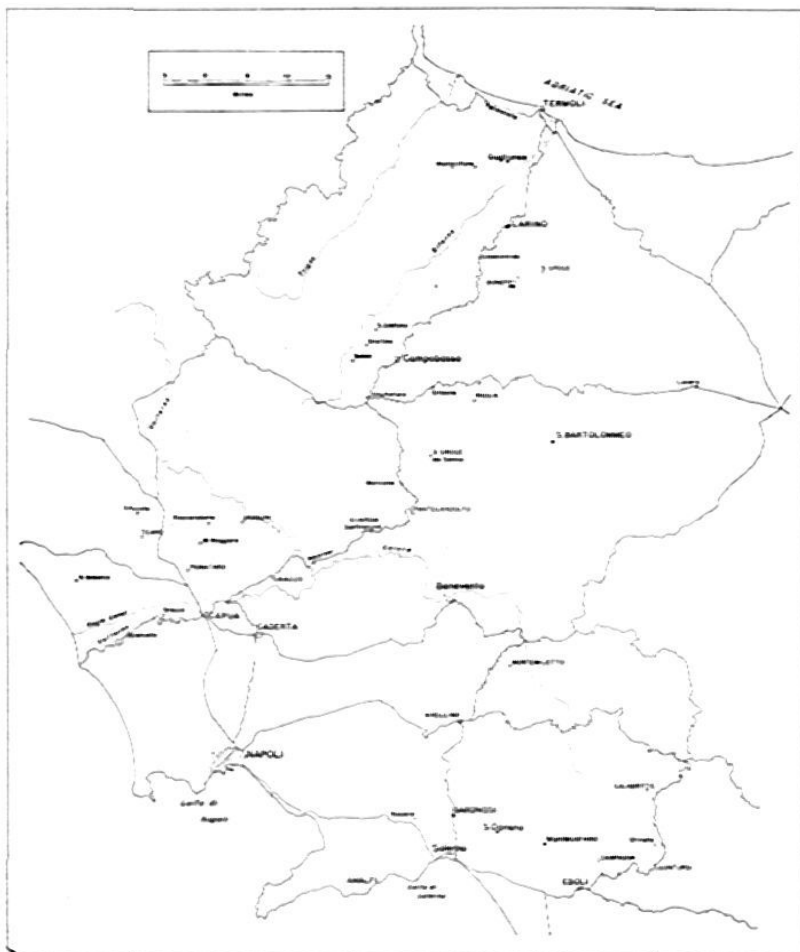
American losses for the entire campaign (from 9 September to the capture of Naples on 1 October) have been officially stated to be

Killed	511
Wounded	5,428
Missing	2,368
<hr/>	
Total	8,307

Losses of the British units of the American Army are officially stated as slightly less than that of the American Corps. Total losses appear to have been about 16,000.

OPERATIONS OF THE BRITISH ARMY

This Army, commanded by Gen. Sir. Bernard L. Montgomery, landed in south Italy in mid-September, without opposition, and then pushed north. It was opposed by German patrols of the 1st Parachute Division, whose mission was to delay the British advance. This was accomplished by destroying bridges and carrying out other road demolitions.



By 1 October the Eighth Army had reached the line **Montemiletto—San Bartolommeo—Santa Croce—Larino (exc.)—Termoli.**

They now found the enemy (estimated to be the 1st Parachute Division plus 1 armored division) in line and holding. The Army had at its disposal a force not yet reported in detail but which included British and Canadians.

It was decided to attack the enemy and endeavor to turn his left, which rested on the Adriatic Sea. The space between the mountains and the sea is slight in this area, varying from nothing to a few miles. Rivers are short torrential streams normal to the coast and separated from one another by rough mountain spurs. Unlike the west side of the Apennines, the mountains are in east-and-west ridges. An advance up the Adriatic coast therefore requires attacks on a long succession of alternate ridge and stream lines. Notwithstanding, the only north-south line of communications in east Italy is along the coast; it is a double-track railroad and a paved motor road. It was believed the enemy received his supplies this way, and that if he lost this line his entire force on the east side of the Italian peninsula would have to be withdrawn.

The plan of attack was to land an expeditionary force from the sea about 4 miles north of Termoli, in rear of the enemy's line of defense which would then be attacked simultaneously from front and rear. The first part of the plan succeeded, the expeditionary force being quietly landed at the selected place before light on 4 October. There was practically no opposition, but it developed quickly. The landing was such a short distance from the hostile positions that within a few hours the British landing force was encircled and completely pinned down. The frontal attack, made with both British and Canadian troops, failed to get through.

In view of this situation the British commander decided to reinforce both the expeditionary force and the frontal attack and deliver an assault on the 6th. Fresh troops were sent to both forces. Three British destroyers reported, to furnish artillery support by enfilading the enemy's lines and to support the landing force in rear of the enemy's positions.

After the battle of the 4th the German commander had about the same idea as his opponent: reinforce his lines and attack. The 16th Panzer Division (or part of it) was moved across the mountains and arrived on the 5th; from some statements it had only 30 tanks—but it is possible that not all of the division was present. On the morning of the 6th the German attack got off first. The British main body was attacked by the 16th Panzer, while other forces closed in around the landing force. The German Air Force sent fair-sized squadrons to aid in the battle, and claims to have sunk 3 landing craft of 5,000 tons each; as this occurred after daylight, it is probable that the reinforcements they brought had already been debarked.

The German tanks had some initial success. An all-day fight resulted as German infantry moved up close in rear of their tanks. German artillery was very active. At the

end of the day the Germans had made slight gains against the British position. They had not been able to overcome the landing force, which was still holding out. The battle continued during the 7th, with the number of German tanks being gradually reduced until there were only about 15 left. When the battle ended the situation was approximately the same as it had been at the beginning.

On October 8th the British counterattacked up the coast road toward the beachhead in rear of the enemy's lines. This was continued during the next day, when success was achieved; the bridgehead was joined to the main line for a net advance of 4 miles in 6 days of fighting.

The plan to advance northward along the coast was now changed: it was obvious that this was going to be a difficult task. In lieu thereof a new plan was adopted, to make the main effort in the interior by a succession of limited advances among the Apennines. The first phase envisaged bringing up the left of the Eighth Army until it was in line with the right, and thereby establish a line perpendicular to the coasts.

The first step was taken on the 9th (when Larino was attacked and taken) and on the 10th (when Pontelandolfo fell). By 12 October the line was

Santa Croce del Sannio—Riccia—Bonefro—Larino—Guglionesi—point 4 miles north of Termoli.

On October 13th Gildone and Guardia Sanframonde were taken; Casacalenda was occupied on the 14th. The Germans then abandoned Campobasso and Vinchiatturo, which with Morcone were in British possession on the 15th. Montecilfone was attacked and taken on 18 October, but was lost the next day to a German counterattack and then retaken on the 20th. On the 19th the extreme British right moved up on the coast to Petacciato.

BATTLE OF THE VOLTURNO RIVER

In the first part of October the American Fifth Army, with British on the left and the Americans on the right, moved up to the line of the Volturno River. It was realized that the enemy would defend this line and that it was necessary to bring forward artillery and ammunition for a major battle. The base remained on the Gulf of Salerno, as the port of Naples was blocked as the result of demolitions which had not yet been disposed of.

The area of proposed operations consisted of flat, low country along the lower Volturno, and a mountainous section east thereof. This low area is known as the Campagne, a remarkably fertile land. Level and low, it is devoted primarily to raising cereals. At this season of the year there was little cover in this plain, which is honeycombed by an extensive series of canals and irrigation ditches which are first-class tank obstacles; they also offer shelter to personnel. The Volturno averages about 100 yards in width along this course, but is deep and swift and nowhere fordable. Its banks are high and nearly vertical, so it also was quite an obstacle. All bridges were out. The whole area is densely populated, the people living in small villages from where they went forth to their daily work in the fields.

At the east end of this flat section is Capua, an ancient town of about 10,000 people. Most of it lies on the south side of the river, but it was unoccupied by either force. American patrols visited it regularly. Two bridges across the Volturno were intact at this place.

East of Capua the Apennines come close to the town, split by the Volturno valley. Fifteen miles up is the junction of the Calore River with the Volturno. At this point the Volturno comes in from the north, making a right-angle turn; the Calore joins from the east. On the north side, in the angle between the two rivers, is the town of Amorosi. Halfway from Capua to this junction, on the north side is another small town—Caiazzo—with a dominating position on a ridge overlooking the Volturno valley. Opposite both Caiazzo and Amorosi the enemy held bridgeheads on the south bank of the Volturno, consisting of infantry with heavy weapons. All enemy artillery was on the north bank, and all Allied artillery on the south side.

In the Campagne the enemy held the north bank of the Volturno only lightly, so Allied patrols had been able to cross. His main line of resistance was 1 to 3 miles back of the river, and his artillery was still further to the rear. Prior to the opening of the battle the enemy air force had almost disappeared from the sky; only occasional reconnaissance planes were noted. In the mountain sections the rivers were fordable at places.

The plan of attack was to drive in both of the enemy's flanks by simultaneous movements close to the sea on the west side and in the mountains between Caiazzo and Amorosi on the east side; in the center a frontal attack was to be made. The attack on the coast was to be aided by landing an amphibious expedition a short distance in rear of the enemy's presumed main line of resistance, which was then to be attacked at the same time from front and rear. If either flank of the enemy should cave in, his entire line would be forced to retire; if both ends caved in, disaster faced him.

This plan to crush the enemy's right with the help of an expeditionary force landed from the sea in his rear was substantially the same type of plan as had already been tried with the Eighth Army on the Adriatic coast. As will be seen, results in the two cases were about the same.

The battle started during the night of 12/13 October with a violent artillery preparation fired by the Allied artillery. The expeditionary force landed as per plan. Instead of doing this quietly, as had occurred on the Adriatic, artillery support was given from the beginning by two British destroyers and one Dutch gunboat which vigorously shelled presumed sensitive points on shore. By moonlight the landing craft beached and the expeditionary troops debarked without great opposition, about three miles north of the Volturno. The enemy was present in the area, but he withdrew to a position in rear of the railroad which runs parallel to the coast and about a mile inland. This position could not be broken.

In the center Allied troops using rubber boats crossed the Volturno at a number of places and, branching out, established bridgeheads in which the engineers were able to construct bridges over the river. American troops entered Capua. This they failed to hold: it will be remembered the bridges were intact at this place, and in the afternoon the enemy's armored troops charged across them and drove the Americans out of the town.

In the mountain section the attack was held by enemy bridgeheads on the south side of the river. Considerable progress was made in reducing these. Throughout the entire day the artillery fire on both sides was very heavy. Capua was nearly destroyed, having been severely shelled by both sides at different times. The enemy's air forces reappeared in considerable strength to raid trains within the Allied lines and

also the forward lines. The Allied air force was similarly active.

On the morning of the 14th the battle was resumed with great ferocity. Rain which had set in interfered with observation but did not prevent movements on the ground. In the low ground below Capua slow progress was made. Troops across the Volturno were under severe enemy artillery fire and their advance was greatly delayed. The expeditionary force remained pinned down in its original position; it too was under strong artillery fire.

An American attack was ordered, to retake Capua. This city was first shelled. Then it was bombed, and in accordance with instructions the planes destroyed the bridges to prevent the enemy from escaping back over the Volturno. He solved the problem thus presented to him in an unexpected manner: he mounted up in his armored combat vehicles and then, selecting his time, suddenly went out from Capua southward straight into the American lines and right down the main road. He got away with this maneuver (which seems to have been a surprise) and reached Caserta, about 4 miles inside the American lines. At this place he created as much confusion as possible by disrupting rear area arrangements. He then conducted a reconnaissance. As a result of the reconnaissance and information received from his air force he suddenly left Caserta and went eastward. Making a wide detour, he broke through the lines outside the battle area in the opposite direction and regained his own side. This incident is not so very important, but it is an illustration of the rapidity with which a situation may change in modern warfare. Capua was duly occupied by American forces whose lines remained continuous and intact.

In the mountain section the fighting continued to be hard, as the terrain was difficult and the opposition severe. The Americans approached both Caiazzo and Amorosi, eliminating enemy resistance south of the Volturno.

The battle continued on the 15th. On the left, along the coast, the British made contact with the expeditionary force, thereby advancing the line for a net gain of 3 miles. It was now at the south side of the Regia Canal, an unfordable obstacle about parallel to the Volturno. Five miles up from the sea the British entered the village of Cancelli, which is just north of the Volturno. To the east of this troops were across the river and had reached points 1 to 2 miles north of it. At Capua not much advance had been made. In the mountain section American troops took both Caiazzo and Amorosi. During the day the enemy made several counterattacks in the Campagne Plain supported by strong artillery fire.

This action practically ended the battle of the Volturno. The enemy's flanks had not caved in, but both had been driven back about 3 miles while in the center the Allied advance was less. During the night of 15/16 October the Germans withdrew their main line of resistance to the ridge line from Monte Massico to Teano; from here the line turned southeast to Monte Maggiore and thence to just north of Caiazzo.

The latter part of the German line was soon abandoned, and the withdrawal of the left followed to the line Teano—Caianello.

On 20 October the Allied line across the Italian peninsula was as follows, all places being inclusive:

South bank Regia Canal at exit into the Gulf of Gaeta—Cancelli—Brezza—Pignataro—Roccaromana—Dragoni—Vinchiatturo—Busso—Oratino—San Stefano—Monteciffone—Petacciato.

MISCELLANEOUS

1. *Italian Axis Government.* On 23 September, Benito Mussolini was formally announced as President and Foreign Minister of the Fascist Republic of Italy. Marshal Rodolfo Graziani is the Minister of National Defense. Inaugural ceremonies occurred at Bologna on 24 September. As far as known, this Italian government has no military strength at its disposal other than police forces.

2. *Italian Allied Government.* This is controlled by Marshal Pietro Badoglio in the name of King Victor Emmanuel. It was located at Brindisi until the first week of October, when it moved to Naples.

On 27 September it was decided that the Badoglio government must be broadened by including representatives of liberal parties both at home and abroad. Liberals, particularly Count Carlo Sforza (who had long lived in the United States), were to be taken to Italy, and the liberal parties, previously suppressed by the Fascists, were to be brought to life again. It was further decided that Italy should sign full terms of surrender and declare war on Germany.

A meeting was convened at Malta on 29 September, at which Marshal Badoglio was present. Also present were the British land, air, and sea commanders and British and American diplomatic representatives.

On 13 October Marshal Badoglio, in the name of his King, declared war on Germany and at the same time announced that representatives of Liberal parties would be admitted to responsible positions within his government. On the same date President Roosevelt and Prime Minister Churchill made a joint public pronouncement accepting Italy as a "co-belligerent." The pledge of the Italian government to submit its own fate to public approval or disapproval after completion of the task of driving the Germans out of Italy, was acknowledged. It was stated that the terms of the Armistice with Italy were in no ways affected by this new agreement.

3. *German Estimate of the Situation.* At mid-October the Germans estimated that the majority of the available Allied divisions in the west Mediterranean were committed to the south Italian campaign. They had identified 13 divisions in line, which did not include others known to be in reserve. It seemed, therefore, that there were not enough Allied divisions immediately available for a new major amphibious expedition. The divisions still available would probably land in south Italy, or not too far in advance of the Allied front line. A quite possible place for the latter would be just south of the Tiber River. A landing north of this area, while not impossible, seemed improbable since the available forces were deemed too small to hold out until an advance overland could reach them.

The following measures have been taken to defend Rome and vicinity:

a. The coast from Ostia south to Nettuno is being evacuated for an average distance of 15 miles back. Usual obstacles and defenses are being erected.

b. Two Italian divisions at Rome (the Piave and Royal Carabinieri) have been disarmed. No more armed Italian troops exist in this area, as far as known.

c. The inhabitants of Rome are not being evacuated. To each resident is being issued 3 days' emergency rations, to be kept until their use is authorized. Every household has also been required to improvise water storage facilities sufficient to last 4 days.

d. All Germans (and members of their families) not required by their duties to be present have been evacuated from the Italian peninsula south of the Tuscan mountain line just north of Florence.

THE WAR AGAINST JAPAN (September 18 to October 20, 1943)

NEW GUINEA

On 18 September an offensive operation envisaging the capture of the Japanese base at Madang was started. A part of the Australian forces was airborne up the Markham valley and dropped near Kaiapit, 60 miles inland from Lae. Three days later the ground elements arrived at the same place. There had been no opposition.

The advance then proceeded overland up the Markham valley, across the ridge, and then down the Ramu river and the Bogadjim road to the coast. Supplies were forwarded by air. After overcoming enemy patrols on 10 October, the Australians arrived within 45 miles of Madang. Enemy opposition now was met, and in the ensuing 10 days no



Australians who landed by plane at Kaiapit (1) cut their way to a settlement 8 miles northwest, moving in the direction of the Jap base at Madang (upper left). At the eastern coast 3 Australian columns closed in on Finschhafen: one via Hanisch Harbor (2), another near Sattelberg (3), and a third from due north of Finschhafen.

sensible advance has been accomplished.

On 23 September another Australian force commenced an operation against Finschhafen, another enemy base on the north coast. An advance overland from the vicinity of Lae was accompanied by an amphibious expedition which landed on the far side of Finschhafen from the ground troops. This was debarked without meeting resistance other than from observation patrols. These groups now closed in on Finschhafen from both sides. Each column sought to advance the inland flank so as to envelop the enemy from that side. Resistance between 28 and 30 September was overcome. On 2 October a dive bomber preparation was launched against Finschhafen, after which the ground troops attacked. No enemy was found; it was assumed he had fled to the hills and would soon be forced to surrender.

From Japanese statements, their garrison at Finschhafen did take to the hills and there joined other Japanese forces who had disappeared a month earlier when Salamau and Lae had been occupied by American and Australian troops. The Japanese state their entire force was concentrated in the vicinity of

Sattelberg, a jungle-covered mountain only 15 miles from Finschhafen and the site of an old Lutheran mission. They claim to have reinforced these troops as well as those at Madang.

As this article closes a Japanese attack has been launched both from Sattelberg and from near Madang. The Sattelberg attack has made slight progress.

SOLOMON ISLANDS

Late in September the Japanese commenced to withdraw their troops gradually from Kolombangara Island. The movement was completed by 13 October, but not without losses from Allied air and naval forces.

In the Solomons the Japanese now hold only Bougainville and Choiseul Islands. The former is strongly held, with extensive air bases at the north and south ends. Not so much is known about the occupation of Choiseul Island, but there is no report as to any important enemy bases on this island.

AIR OPERATIONS

A major Allied air attack was delivered by day on 13 October against the large enemy air and sea base at Rabaul, on New Britain Island. Medium planes attacked the two airfields and heavy bombers the harbor. In all, about 350 tons of bombs were dropped. According to Allied reports, of his air force the enemy lost 26 out of 40 fighters met in the air, and 100 planes destroyed on the ground; in the harbor he lost 3 destroyers and 3 other ships. The Japanese report claims they lost only 1 ship and 15 planes, as against an Allied loss of 13 planes downed out of an estimated 200 attacking.

The Allies continue to maintain active air surveillance on an arc through Timor, the Amboina Islands, New Ireland and New Britain Islands, and the north Solomons.

SOUTHEAST ASIA

The new Allied C-in-C, Lord Louis Mountbatten, arrived at New Delhi, India, on 7 October and assumed command. He immediately commenced a series of conferences with subordinate air, sea, and ground commanders. His chief of staff is to be Sir Henry Pownall; his deputy chief of staff is Maj. Gen. Albert C. Wedemeyer, U.S.A.

Military activity until recently has been limited to Allied air raids over Burma, which were daily and heavy. For some time the principal objectives were railroads and river craft, of which an astonishing number has been reported as destroyed. Commencing on 15 October the main mission of the air forces was changed to attacking airfields and ground troops. This action is probably due to the new C-in-C.

On 10 October the enemy, fearing an Allied offensive against Burma (for which, however, they have long prepared), initiated new measures. Ground patrolling along the India frontier was increased. So was air activity. Ceylon and Madras were visited, and the latter place bombed. The major Allied air base at Chittagong was attacked on 20 October. Damage on both occasions is reported as slight.

On 1 October an enemy force, estimated as one division plus one regiment of cavalry, started north from Lashio, up the Salween valley. Another division started east from Myitkyina,

also to the Salween valley. By 10 October both columns were in the Salween valley, about 105 miles apart and working toward each other. The mission of this operation is to drive Chinese forces back up the Burma road into China. On account of the rough nature of the country these Japanese divisions are specially equipped for mountain warfare.

CHINA

Training centers for infantry and field artillery have been operating since April. They are supervised by American officers who are responsible for instruction, but not for discipline. The Chinese do not take kindly to yielding to foreigners on matters relating to personnel. American mountain guns and infantry heavy weapons are available, with a reasonable amount of ammunition. Courses are given for both officers and enlisted men. Up to October the total graduates were 3,000 from the Infantry courses and 5,000 from the Field Artillery.

The Japanese blockade is reported as very efficient. The greatest need of the vast Chinese army (which on paper shows four million men) and of the nation also, is food. Lack of food requires military units to engage in farming to feed themselves. Other units have insufficient food to maintain good physical condition.

The air transport service from India into China is performing marvels in bringing in supplies, but nothing compared to what is needed for 400,000,000 people. The urgent solution desired by the Chinese is the opening of ports, especially Canton.

U. S. field hospitals have arrived in China. About 25% of the enlisted personnel is provided by Chinese (Cantonese). They happen to be stationed where another language is spoken, and cannot make themselves locally understood. This illustrates the

fact that the Chinese are a group of nations speaking numerous languages which differ materially from one another. They do not differ as to writing, for the Chinese hieroglyphics represent things, not sounds, and consequently can be read by anyone familiar with the written language.

JAPAN

On 22 September the Japanese government announced that in view of the threat of bombing their cities, recognized as possible, the government offices and war industries were being scattered. It did not say to where. It further stated that a great industrial expansion was in progress, with special attention to an early and large increase of Japanese air forces, the army, and of ammunition. To this end the entire personnel of the nation was being mobilized, to include the women. Including Manchukuo, Japan could now produce all essential war supplies (including oil) to continue the war indefinitely.

Americans repatriated in exchange ships have reported that the scattering of Japanese industries and offices is by no means limited to displacement within Japan: many are going to China, and reports had been heard that the Japanese Government might itself move there if and when necessary.

On 5 October Japan installed native municipal and provincial councils in Malaya, as a preliminary to declaring an independent state. On 14 October the Philippine Islands were declared independent and a native President was installed at Manila. The new government then signed a military treaty of alliance with Japan. On 15 October a Central Council was convened in Java with a view to adopting a Constitution and becoming another state.

Reports as to Japanese success in organizing native states in the Far East to cooperate with her are very incomplete. As nearly as can be determined the situation is about as follows:

China—The government of Wang Ching-wei is functioning at Nanking and has raised a considerable army. It is questionable as to whether this army is dependable enough to be counted upon to fight the Allies. Many of these troops are probably serving for a very common reason in China—they are fed and clothed.

Burma—The Japanese are having some success in organizing this country against the Allies, due to there having been an anti-British party before the war started.

Siam (Thailand)—Same as Burma.

Malaya—No reliable information.

Netherland Indies—The educated people appear to desire independence from Holland, on the ground that the East Indian population is now fairly civilized and capable of managing its own state. They no longer believe it sensible to be dependent on a distant and very small country, and desire to terminate the relationship. There is no personal objection to the Dutch, whose civilizing influence is acknowledged.

The natives do not like the Japanese, but some are co-operating.

Indo-China—Best advice is that this is strongly anti-Japanese.

Philippine Islands—Practically all of the better class, and a majority of all inhabitants, dislike the Japanese and prefer American control. As far as can be ascertained Japan has not been able to raise troops in the Philippines, except usual police forces.

Mongolia and Si-Kiang (Sinkiang)—These provinces were conquered by the Manchus at various times prior to 1878, while Manchus dominated China. They were later taken over by Russia. The natives who are not Chinese are members of the Turk race, and Mohammedan. There is no evidence that they will be an asset to Japan.

The Russians are evacuating Si-Kiang completely. There is no report that they are evacuating Mongolia.



THE WAR IN RUSSIA (September 24 to October 22, 1943)

On 20 September Russian reports were that the entire German line appeared to be cracking, for in no other way could the recent Russian advance be explained. It was believed that for such a situation a vigorous offensive was indicated. Close and constant pursuit, with offensives against any enemy force holding, were directed within the active sectors.

The inactive sectors extended north from Novosokolniki, and consisted of the Finnish and Leningrad sectors. The Finn front had been quiet for some time, except for the patrol activity which was maintained by both sides. The line extended east of the Finland frontier and reached Lake Onega, the west side of which as far as the Svir River was held by the Axis. This occupation interrupted the railroad and canal which extended north from the Leningrad area to Murmansk. North of the Onda River the line was held by 6 German divisions, south of the Onda, by about 10 Finn divisions. Some 4 Finn divisions were in reserve, making about 20 divisions in all covering Finland.

The Leningrad sector had for its front a line from 10 miles south of Leningrad, thence along the Volkhov River, Lake Ilmen, and the Politsa River to Novosokolniki. Both north and south of Lake Ilmen the Russians made frequent strong attacks, supported by considerable artillery and air forces. None were persisted in, and no material change in the line has occurred for some time. The Russian attacks appear to have had the mission of ascertaining whether the Germans were withdrawing troops for use further south, in which case an offensive in this area might be indicated. Strong German reaction to attacks and immediately following counterattacks have led to the conclusion that the Germans are not withdrawing from this sector but intend to defend it. Russia's attacks were therefore not pushed.

The entire front south of Novosokolniki has been intensely active, and will be considered by sectors as follows: North, North Central, South Central, South, and Kuban.

Notwithstanding that the Russians believed that the German line was cracking, their intelligence reports show that the German strength in Russia has not materially changed. The latest available estimate, as of 9 October, shows Axis divisions in Russia as:

On Finn front	16 divisions (see above—all 2nd class)
Between Leningrad and Black Sea	169 German divisions—all 1st class
In rear areas	26 divisions, all 2nd class and including 3 Hungarian and 3 Romanian divisions.
Total	211 divisions, excluding 4 Finn divisions otherwise reported in army reserve.

German divisions in Russia have been identified (by prisoners) as recently arriving from west Europe. Other German divisions in south Europe have been identified (by reports of secret agents) as recently from Russia. The evidence indicates that Germany exchanges divisions between active and inactive fronts, but that the total number in Russia has remained about constant.

Russia has intensified the activity of its partisans operating in German rear areas, particularly in the forests and swamps of the Minsk, Pinsk, and Pripet areas. German and Hungarian troops occupy the key points in this area, and their air forces

destroy by incendiary bombs the villages, camps, and bivouacs where partisans have been located. Many of the forests are burning, and a fine ash is falling almost without interruption on the burned-out country. The entire district is reported as one of utmost desolation.

The partisans have their families with them, and live in carefully camouflaged huts and bivouacs in dense woods. They have livestock and considerable rye, which is baked into bread in huge communal ovens. They planted crops during this autumn, and this work was not interfered with by the Germans. Russia's own reports indicate that notwithstanding efforts to increase partisan operations in German rear areas, these have in fact decreased. As the Germans retire and there is less occupied territory to watch over the strength of guards has increased; this has offset partisan attempts.

In withdrawing across the Dnepr River the Germans removed about everything that was not fixed to the ground. A Swedish correspondent near Kiev reports that where he was, he estimated that 106,000 cattle, 110,000 sheep, 60,000 horses, and 62,000 impressed Russian stock tenders had been moved to west Ukraine. Another Swedish observer estimated noting about 40,000 wagons of supplies and 250,000 peasants passing westward.

NORTH SECTOR

At the opening of the period the line was

Novosokolniki (German)—Nevel (G)—Demidov (Russian)—Smolensk (R)—Pochinok (R)—Roslavl (R)—Kletnya (G)—Mglin (R)—Unecha (R).

Following the evacuation of Smolensk and Roslavl by the Germans on the night 23/24 September, the Russians were continuing a major offensive westward. Their immediate mission was to overtake the retreating enemy, force him to fight, and inflict disastrous losses on him.

It was not easy to overtake him. The Germans had sent their trains and heavy materiel on ahead, and they destroyed all bridges behind them. With two exceptions roads were unpaved, and due to heavy rains were impassable for heavy traffic. The country was covered with forests, marshes, and swamps, and detours around demolitions were not at once available. As Smolensk and Roslavl had been left in flames, the Russians were unable to occupy these cities until the 25th. The infantry by-passed these places, got around other obstacles somehow, and maintained touch with the enemy along the two main highways extending westward from the burning cities. These were not cleared for passage of trains until the 27th.

Marching day and night, without any trains, the advance reached the line Rudnya—Krasnoe—Krichev by the 30th. Here the enemy was found to be in strength. The comparatively weak Russian advance group was forced to stop and wait until tanks, artillery, and supplies could be got forward through a devastated country. Orders were issued by the High Command to suspend the offensive until a date to be announced later.

The High Command decided to fix a time when it would be practicable to attack everywhere along the entire active front. It was found that 6 October would be that day. An artillery preparation was thereupon fired all the way from the vicinity

of Novosokolniki to the Sea of Azov, with a view of making it impracticable for the enemy to decide where the real attacks would be launched. These were ordered for the morning of the 7th.

In the North sector the main attack was directed on the extreme right, opposite Nevel. This part of the sector had not recently been active, and it was hoped this offensive would surprise the enemy. Five divisions were made available for the main attack, which was divided into two parts.

Nevel is shielded by lakes, swamps, and forests. There are but few roads, and these were covered by strongly held centers of resistance. The Russian commander, Gen. Andrey I. Yeremenko, decided to make his main effort through the forests, which were believed to be impracticable for movements of large forces and therefore were but lightly held by the Germans. On his side of the line he prepared for this movement by building roads through forest marshes all the way to the front. Batteries were installed and ammunition brought up. Necessary materiel was accumulated for extending roads into enemy territory as soon as this was occupied. Armored troops were assembled.

On the 7th a tremendous artillery preparation was fired against that part of the front which was strongly held by the enemy. Only restricted fire was permitted in the forest sections. Upon completion of the artillery preparation infantry attacked with tanks down the roads, following a rolling barrage. They did not succeed very well. In the forest section the Russian infantry infiltrated forward, attracting as little notice as possible. The engineers with their materiel came close behind, opening roads as they went. This advance was directed straight toward Nevel, by-passing the enemy's centers of resistance. It continued right on through the night and into the next day.

Proceeding across country and avoiding lines of communication, the Russians arrived near Nevel during the 8th. The indefatigable engineers had gotten tanks forward, and also batteries. Suddenly and unexpectedly emerging from the forests, the Russians dashed into Nevel, and their tanks (covered by artillery fire) were in the city before the Germans realized what was happening. There was a hot fight in the streets, ending with the Russians holding Nevel. They claim to have taken 600 prisoners with 22 guns, and estimated other German casualties at 3,000.

In view of this success the Germans abandoned their strong points east of Nevel and withdrew westward. Following the opening of the attack on the 7th the local German commander, believing that this was a major offensive, had promptly so reported and demanded reinforcements. These were as promptly furnished and commenced to arrive on the 8th, in time to prevent the Russians from greatly exploiting their initial victory. By 13 October the fighting in this vicinity died down, with the Russians in firm possession of Nevel.

Further south the general attack of 7 October resulted in the capture on the 9th of Liozno, on the Vitebsk—Smolensk railroad. The Russians used the same tactics as at Nevel: a real attack was made on the first day against the strongly guarded road and railroad approach; under cover of this movement other divisions passed through forests and marshes to in rear of Liozno and then stormed the town. The Russians report taking 22 guns and 46 tanks in this engagement, and estimated other German losses as 1,200. No prisoners were taken, so it is

presumed that the Germans observed the turning movement in time to make an orderly withdrawal.

Still further south there was only restricted opposition to the Russian advance until it reached the Sozh River, where it met strong resistance. At the end of the period the line in the North sector was

Novosokolniki (G) — Nevel (R) — Liozno (R) — Krasnoe (R) — Gorki (R)—Chausy (G)—Propoisk (G)—Sozh River—Gomel (G).

NORTH CENTRAL SECTOR

On 24 September the line was

Starodub (R)—Seminovka (R)—Snov River—Desna River with Russian bridgehead at Chernigov—Dnepr River with German bridge-heads at Kiev and Cherkasi—Zolotonosha (R)—Goltva (G).

The center of this line was solid along the Dnepr River. At the north and south ends the Germans were in process of withdrawing, with the Russians following.

Believing that the German line was "cracked," the Russians determined not to wait in an attempt to cross the Dnepr River. During the night of 25/26 September parachute troops were dropped in considerable strength in rear of the Desna River below Chernigov and in rear of the Dnepr between Kiev and Cherkasi, opposite Pereyaslav. These groups received some severe losses from German attacks, but were able to hold out. They were reinforced on the next night, and at the same time Russian ground troops struck southward on the west bank of the Desna from the Chernigov bridgehead and commenced regular river crossing operations south of Oster over the lower Desna and in the bend of the Dnepr south of Pereyaslav. Both of these attempts succeeded. The parachute troops were partly overcome by the Germans, but probably justified their effort by distracting attention from the operations on the ground. These ground operations were energetically pushed, and by 5 October the Russians were across the Desna north of Kiev and held most of the river bend near Pereyaslav.

On the day preceding the general Russian offensive ordered for 7 October, this sector fired an artillery preparation along the entire front. The main attacks were limited to developing the two bridgeheads already established, coupled with a new effort to cross the Sozh just south of Gomel. In all three places the Russians made progress, and they were able to cross heavy tanks over the Sozh and the two Dnepr crossings. These offensives were pushed continuously on succeeding days.

On 12 October a German counterattack was launched against the Russians at the Sozh bridgehead. This was delivered after a strong artillery and air preparation by armored and motorized troops, and drove the Russians back across the Sozh. The Russians lost some of their artillery, but the major part had not crossed the river and was intact.

Without losing time the Russians made a new attempt. They had lost their bridge materiel in the German attack and had none available. A regiment of infantry cut logs in the forests that same day and made rafts out of them. On the night 12/13, using the improvised rafts, the Russians came right back across the Sozh during a heavy rainstorm and established themselves again on the west bank. On the 14th the Germans counterattacked the new Russian arrivals and drove part (but not all) of them back.

Now the Russians brought up additional forces. On 17 October the attack was extended on the south to below the junction of the Sozh and Dnepr Rivers. This succeeded, and

Loev was captured the next day. The advance then moved northward along the right bank of the Dnepr between that river and extensive swamps about 10 miles to the west. This advance was not stopped by the Germans until the 20th, when it was close to Rechitsa.

While this attempt was being made, another was continuing north of Kiev. By 17 October the Russians were across the Dnepr near Dymmer, and attempting to proceed south toward Kiev. This met severe resistance, and has not been able to advance far. Up to 22 October it has had alternate successes and failures. At this date the Russians were over, holding a small bridgehead.

The Russian river crossing south of Pereyaslav advanced slowly. It has gained most and possibly all of the river bend, but the Russians have not been able to debouch therefrom.

On 22 October the line in the North Central sector was

Gomel (G)—Rechitsa (G)—Loev (R)—Dnepr River to Cherkasi, with Russian bridgeheads about 10 miles above Kiev and in river bend south of Pereyaslav.

SOUTH CENTRAL SECTOR

On 24 September the line was

Bieloserkovka (on Psel River) (R)—Poltava (R)—Dnepropetrovsk (G).

The Germans were in process of withdrawing across the Dnepr River. They fought only minor rear guard actions, and by the 28th the Russians had everywhere reached the left bank. Russian parachute troops were dropped on the west side of the Dnepr during the night of 25/26 September, but this early attempt failed.

Offensives were now suspended until the general offensive for all active fronts ordered for 6 October. On this date a violent artillery preparation was fired all along the front, but on the next day only one major attack was delivered in this sector. This was a crossing of the Dnepr on a front of about 20 miles commencing at the north end near the mouth of the Psel River. This attack was made with very strong artillery and air support, and it gained from the first day. The Germans seem not to have had any considerable number of reserves in this sector, so the Russians were able to establish a bridgehead 10 miles deep. Then they stopped and proceeded to accumulate within the bridgehead a large quantity of ammunition and supplies and to assemble a force of 20 divisions (including several armored divisions, the number of which has not yet been ascertained). This lull appears to have deceived the Germans into believing that this attempt was not so serious as the others further north, which were being daily pushed with vigor.

On 16 October the Russians were ready, and attacked from the bridgehead on all three outward sides on a total front of 45 kilometers. Their main effort was toward the southwest and was preceded by a terrific artillery preparation reported to have been of the usual great Russian intensity. Two armored divisions acting as a spearhead were closely followed by four infantry divisions on a front of about 10 miles. The Russian armor met a large force of German armor, and an immense tank battle followed. A very strong force of Russian battle planes intervened to aid the ground troops, and were in turn met by strong German air forces. The battle was very severe both in the air and on the ground, and ended with the Russians having made an advance of 3 to 6 miles against a loss of 120

tanks and heavy infantry losses. Russian reports claim a loss of 25 German tanks and the capture of 250 prisoners.

During the night the Russians replaced their front line troops, and on the morning of 17 October renewed the attack. The battle of the previous day was repeated, with the Russians advancing another 6 miles (as far as Popelnastoye) against strenuous opposition. The Russians furnished fresh troops to continue the battle during the night, and then attacked again on the 18th. This uninterrupted battle day and night exhausted some of the German troops, and the Russian armor now broke through for a gain of 12½ miles. The country is generally rolling, without natural obstacles, and suitable for tank maneuvers. The Russian advance was only stopped by the German second line, establishment of which is now standard practice as imperative in open country. There was an extremely large German air force on this line.

Once more a new contingent of Russians leap-frogged the forward lines and fought all night, and again on the 19th a new attack was launched. This was a very bloody battle. The Germans used the largest air forces ever reported on the Russian front, exceeding 1,000 battle planes, which attacked Russian armor and batteries and interfered with supply and communications. Despite severe losses the Russians succeeded in reaching Piatikhatki Junction, but in general the German line held.

The Russians now changed their plan: for the 20th the main effort was made on the north side of the bridgehead, with but limited forces; this made a slight gain. On the 21st the main effort was on the west side; this reached Petrovo, nearly 50 miles inland from the Dnepr. A part of the Russian armor in this attack wandered too far away from its air and artillery support and was overwhelmed by the German artillery and air force. The Germans now had air superiority, but not air control. The Russian air force was fighting back hard. On the 22nd the Russians made their main effort down the right bank of the Dnepr and close to it. This reached Verkhne Dneprovsk.

At date of writing this battle is not finished. It may turn out to be a classical example of a modern attack, by operating day and night without intermission over extensive battle areas. The Germans claim that so far in this great battle their air force has inflicted extraordinary losses on the enemy, but there is as yet no confirmation of this.

At the end of the period the line in this sector was

Dnepr River from Cherkasi to Kremenchug—Syokoie (?)—Petrovo (R)—Piatikhatki (R)—Verkhne Dneprovsk—Dnepr River to Dnepropetrovsk (G).

SOUTH SECTOR

At the beginning of the period the line was

Dnepr River from Dnepropetrovsk to Zaporozhe (German bridge-head here)—Vasilevka (G)—Fedorovka (G)—Melitopol (G)—Molochna River to Sea of Azov.

The banks of the Dnepr in this sector are low, and the country is flat and cultivated.

On 26 September the Russians launched a heavy attack against the southeast face of the Zaporozhe bridgehead, using strong tank and air support. At several points this entered the German lines. A German Panzer attack in turn entered the Russian lines; continuing on, it reached the artillery area and put out of action 16 Russian batteries and a number of tanks which intervened to save the batteries. The Panzers attacked

the Russian reserves and caused so much disorder that the attack failed, notwithstanding its initial success. Then the Panzers returned to their own lines.

The Russians brought up fresh troops and renewed the attack on the 27th and 28th, but the Germans repulsed the attacks and regained the salients the Russians had taken on the 26th. By the 30th the fighting died down, leaving the line practically unchanged.

The Russian commander on the south front was Gen. Rodion Y. Malinovsky. Realizing the strength of the German position, he decided first to assemble artillery and ammunition, armor and air forces, and then attack the extremities of the enemy's line at Zaporozhe and at Melitopol. In rear of the German positions as far as the Dnepr the terrain was flat mud, with no natural defense features. If Russian armor could break through at the two ends this large maneuvering space would afford an opportunity to encircle the entire German army in this sector.

Lieut. Gen. Vasily I. Chinkov was assigned to command the operations against Zaporozhe. On 2 October a new and massive attack was opened. It was prepared by strong artillery fire and attacks by bombers and battle planes. Then the tanks and motorized infantry advanced. Only minor gains were made, and the offensive was suspended pending arrival of further reinforcements.

These had not arrived by 6 October, the day prescribed for a general Russian offensive. In this sector this did not occur until the 12th, by which date the Russians had assembled a powerful force. The right of their line north of Zaporozhe rested on the Volnyanka River, and the left on marshes south of the besieged city. In compliance with orthodox military rules a detached force was organized and posted to the north, to prevent any attempt to attack the besieging forces from the rear. According to Russian reports this detached force was attacked by German armor coming down the east bank of the Dnepr and was driven away, but there is no confirmation of this in German reports.

The attack commenced with an artillery preparation along the entire front, which at the proper time changed to an extremely dense concentration on two selected sectors due east from Zaporozhe. The artillery succeeded in punching gaps through these sectors. Infantry and armor then advanced, preceded by a dense rolling barrage. Due to the fact that the cultivated fields contained innumerable dikes and ditches, the armor was confined to action along roads and the infantry advanced cross-country. The air forces of both sides intervened and a tremendous air battle occurred. The battle on the ground was most violent: one of the fiercest of the war, with heavy losses to both sides.

On 13 October the battle continued with equal intensity, with the Russians steadily advancing through the two gaps until nightfall, at which time they were 3 to 5 miles from Zaporozhe. The Germans now gave up the fight, and during the ensuing



night evacuated the bridgehead. Blowing up the road and railroad bridges, they also destroyed the adjacent Dnepr dam and power station.

In accordance with the original plan Gen. Chinkov now turned south. The left of the German line covering the lower Dnepr area was not at Zaporozhe but near Vasilevka, and the Russians have not yet been able to break this center of resistance.

In the meantime Col. Gen. Feodor I. Tolbukhin had been detailed to conduct operations for the reduction of Melitopol. This is a city of about 25,000 people not far from the Sea of Azov and on the east side of the Molochna River, with railroad station on the west side. There were several lines of German defenses around this town. The initial attacks on 9 and 10 October failed to make much of an impression, then on 12 October (the same day as the attack on Zaporozhe) an attack in great strength was delivered on Melitopol. The main artillery preparation was at first distributed over the entire front, then suddenly concentrated on a sector to the south to punch a gap partly through the German lines. Armor and infantry then advanced through the gap, fighting on through the 13th. They crossed the Molochna and, turning north, entered Melitopol from the southwest.

The Germans did not abandon the city nor desert the lines nor overcome. They resisted everywhere. Very severe street fighting continued for about a week, with neither side able to drive the other out. The Russians had to fight their way through the city from south to north. They attacked the lines to the north of the city with a view of enveloping it, and met the strongest resistance they had had this year. On the 21st the Russians commenced a very powerful attack just north of

Melitopol. This made progress, and on the 22nd it reached the outskirts of the city on this side. As these lines are written the Russians have practically secured possession of Melitopol after ten days of most savage house-to-house fighting within the city and bitter fighting outside of it.

The line in the south sector now is

Zaporozhe (R)—Vasilevka (G)—Fedorovka (G)—Melitopol (R)—Molochna River to Sea of Azov.

KUBAN SECTOR

At the beginning of this period the German bridgehead in Kuban was limited to the area west of the line Temryuk—Anapa, both inclusive. The garrison included Romanian divisions.

On 19 September, German GHQ issued orders for the abandonment of the bridgehead and the withdrawal of the garrison to the Crimea. The movement commenced without delay by ferrying the troops across the Kerch Strait. German light naval forces were in charge of the water passage, and special air detachments provided overhead cover.

The Russians did not immediately discover this movement, but they suspected it. On the night of 25/26 September a Russian amphibious force attempted to land in rear of the German front line. This failed. On the 27th the Germans evacuated Temryuk, but the Russians were able to cut off the rear guard and capture 400 prisoners. Anapa was next evacuated.

Another Russian amphibious attempt was made on 5 October, but failed as before. The final German withdrawal was on the night of 8/9 October. Preceding this movement, the Germans repulsed an attack by tanks and infantry by using a strong force of artillery. The guns were left behind that night, the gunners firing them until the last moment. This ends the German hold in Caucasia.

COMMENTS

1. Russian expenditures of personnel and materiel in 3½ months' fighting have been severe. Nothing official has been revealed as to the real figures. The following information gives some idea of its extent.

It is officially announced that very large increases in lease-lend shipments will be made immediately. Special regard will be had to furnishing planes, tanks, and weapons. A great increase is to be made in food supplies.

Chungking reports that the Russians are evacuating Sinkiang (or Si-Kiang). This immense province was invaded by Russia in 1932, since when large numbers of Russians have been established there. All are returning to Russia, taking with them all plants and tools, including an oil refinery and numerous mines.

According to a German estimate of 7 October, the Russian losses for the period 5 July to 5 October were 1,000,000 killed, 820,000 wounded, 120,000 prisoners. There is no confirmation of this.

2. Russia started to issue winter equipment on 1 October. It therefore seems prepared to go on during the coming winter.

3. Refugee Problems. There is much evidence to indicate a most extensive transfer of populations by the German authorities. Certainly they have by now had large experience in this, and reports indicate a perfectly astonishing mass of supplies accumulated for German use. To this has been added the population of occupied districts, who are being regimented into furnishing labor.

All of this requires much planning. It will require more to disentangle the mass of refugees—many of whom no longer have any place or home to return to. This will be a G-1—G-4 problem of the first order.

4. Tactics. Continued use of artillery to break enemy fronts is common. Artillery preparations now cover a greater area than formerly. They may switch at a predetermined hour from a wide sector to a very narrow one (not exceeding 1 mile in width) through which a most dense fire is placed to punch a gap through which armor can dash.

In general, if properly launched in sufficient strength the armor does get through. It may not get beyond, and in Russia it generally hasn't. For the defense the solution is to use armor and air forces to intercept the assailing troops before they can branch out into rear areas. This interception leads to violent armor and air battles back of the defenders' front lines. As this may go against the defenders, a second line must be provided on which the enemy's armor can be brought to a stop.

Coordination of air and ground battles by a single commander directing forces on ground and in the air is essential. The air forces must furnish necessary reconnaissance information to the ground, and the latter must act with great rapidity as the situation is divulged. There is no longer any time during a battle for orders, other than verbal or radio ones.

Written orders are restricted to general directives for opening a battle (or for resisting, if on the defensive). They prescribe the objective in an advance (or lines in rear on which to rally), the position of reserves and when they shall be employed and by whom. Details for units are left to local commanders who, however, must be constantly informed as to the situation and the changes, if any, in missions.

Artillery particularly (except for opening preparations, for which a detailed plan can be prepared and followed) must act independently during a ground battle. Artillery commanders must watch both air and ground. Battalion commanders are primarily responsible for selection of targets, and higher artillery commanders for assembling the proper amount of artillery in various sectors. They must be advised in time as to intentions to advance or to withdraw, and at all times furnished full information as to positions of their own troops as well as of the enemy.

Artillery preparations may be planned and prepared by artillery divisions, which are independent and in addition to the normal division, corps, and army artillery. The latter may assist in the preparation, but must be prepared to displace forward with their infantry and armor. The artillery divisions may reinforce these artillery units as necessary, or replace units that have been lost.

Taking an over-all view of the modern battle, it is much more complex than in previous times. It requires leaders who have active and imaginative minds, and who can foresee the probable course of events and be prepared to solve the tactical problems as they quickly appear and change. In this, nothing surpasses experience.



West Point cadets use on maneuvers an especially interesting version of the 105, called the M3. Twenty-eight inches of the muzzle were sawed off, and the remainder mounted on the carriage of the 75-mm field howitzer. This lighter carriage does not stand the recoil of higher charges, but with charges 1 to 5 there is no loss of accuracy despite the shortened tube.

A SUDDEN CHANGE OF K

By Col. George B. Ely, FA

Rarely is the range measured on the map or chart equal to the range found by registration. For firing after registration a factor must be applied to measured ranges. This factor, K , is the number of yards per thousand yards that must be added to or subtracted from the measured map range to place fire upon the target. Once a determination of the range factor (K) is obtained by registration, many artillerymen assume that this factor will remain nearly constant for some period of time. Generally, he is right; he learns by experience, however, that during the transition from day to night or night to day, changes occur in meteorological characteristics of the air which may make considerable change in K . It may be considered that only rarely will the several meteorological factors affecting K change at the same or in a very short time. This situation may create a tendency to rely too much upon the receipt of meteorological information as an indicator of the time for a correction of K , and to make the appropriate changes in the firing data. That artillerymen should be weather conscious and anticipate changes in conditions which will affect their firing is shown by the following example:

On 15 May 1943 a scheduled field artillery firing demonstration at the Cavalry School was being conducted by three Armored Field Artillery Battalions, 105-mm Howitzers (SP), from nearby Camp Funston. This demonstration was scheduled for the combined purpose of showing the ability of the field artillery in massing their fire, the effect of artillery fire, the conduct of artillery fire adjustment by a forward observer, and indoctrination of the students and observers in overhead fire. There were present for this demonstration approximately 800 students and observers.

Students and observers formed on the line of blue flags (Fig. 1) which were sited from 325 to 350 yards from battalion concentrations Nos. 1, 2, and 3, along the north bank of Seven Mile Creek. The average map range of these concentrations was 3,500 yards. After the firing of these concentrations the students and observers moved forward about 40 yards to the top of the rim rock on the north side of the valley and formed on a line of white flags. On signal, battalion concentrations Nos. 4, 5, and 6 were fired, the average range being 3900 yards; these were located at a taped distance of 350 yards (Fig. 1) from students. Upon completion of these concentrations, students and observers moved north about 400 yards and formed on a line of red flags at which time a three-battalion concentration No. 7 (located at a taped distance of 350 yards from students) was fired. Charge 5 was used throughout the demonstration.

On the day before the demonstration the usual rehearsal was conducted and K was determined. About 1400 on the day of the demonstration registration on the base point was conducted, before the arrival of the students, for the purpose of correcting K . The only change noted was accounted for by a strong (about 30-35 m.p.h.) south wind. The sky was overcast with dark ominous clouds that had been gathering for two days, but were not alarming as it was generally assumed that another spring shower might develop in the late afternoon or evening and the only concern was to complete the demonstration before the torrent descended.



Figure 1—Fort Riley and vicinity

Students and observers were formed on the line of blue flags at approximately 1430, and after preliminary orientation the signal was given for the artillery battalions to fire simultaneously their concentrations Nos. 1, 2, and 3. This was accomplished in a very creditable manner, battalions having corrected their firing data from information obtained from the check registration. These concentrations were exactly where desired (Fig. 2),



Figure 2

indicating that at that time the factor K was as nearly correct as could be expected. After checking with the Division Fire Direction Center, a matter of possibly one or two minutes, the command was given to march students forward onto the rim rock and form on the line of white flags. At this same time the storm broke and for 20 minutes rain and hail the size of walnuts beat upon the helmets. The wind, still very strong, shifted 1600 mils to the left flank, the temperature dropped uncomfortably, and as was later learned there

was an accompanying decrease in air pressure and density. When students formed on the line of white flags and there was an apparent slackening in the storm, the command was given to fire the three battalion concentrations Nos. 4, 5, and 6.

This covered an elapsed time of 10-15 minutes from the firing of concentrations Nos. 1, 2, and 3. Then radio communications (which had been none too good due to static interference) went out entirely. The artillery began firing the ordered concentrations and about 12 rounds fell about 150 yards in front of the students and observers instead of the intended 350 yards. Many fragments fell among the students before firing was stopped, but fortunately only two minor injuries resulted.

Communications were finally restored, the elevation increased, and the demonstration continued without interruption. However, during the delay the students and

observers witnessed a tornado consisting at times of 8 separate pipes about 6 miles to the south, moving from west to east. Upon return to the Academic Area it was learned that considerable property damage had been done uncomfortably close to the south.

During an elapsed time of 10-15 minutes *K* changed approximately 50 yards, due to abrupt and simultaneous changes in meteorological conditions. As in this instance the change was a decrease, it may be easily seen that under combat conditions, unless the artilleryman is watchful, serious results may be obtained which might adversely influence a battle, at least locally. *K* is *constantly* changing, however small that change may be. The field artilleryman must be ever alert and weather conscious, taking such steps as are logical and necessary to make his fire as accurate as possible—for the most important part of the trajectory is that which strikes the enemy.

THE AZORES

By Dr. Otto Constantini

Writing in *Militar-Wochenblatt* shortly before we entered the war.

Nearly 1,400 km from the European mainland lies the island group of the Azores, a Portuguese possession, in the same latitude as Lisbon and Washington. This island group extends for 360 km from southeast to northwest and consists of nine larger and a few smaller islands, in all having an area of 2,400 square km. In very early times the Azores, because of their extremely favorable commercial position, were already of great importance, and today they have been pushed to the front of political interest.

The Azores rest upon the great ridge which runs through the entire Atlantic Ocean from the Arctic Sea to the Antarctic. Although on both sides of this ridge the ocean drops away to depths of 4,000 to 7,000 m, the islands rise to a height of 2,300 m and their highest mountain lifts high above the level of the sea.

All the islands have high mountains and deep gorges. The island group is of volcanic origin, and the volcanic activity is not extinct even today. Nearly all the volcanoes have erupted in historical times (since the discovery of the islands in 1431). Hot springs and sulfur springs and kettle-shaped mountains with steep walls and containing lakes (called caldrons), are the visible traces of volcanic activity. Repeated subterranean rumblings and tidal waves indicate that the internal earth in this region has not yet come to rest.

In the Azores a healthful equable climate prevails, with an average annual temperature of 17-18 C. The precipitation decreases in the winter months and increases in the summer. The mild uniform climate is traceable to the gulf stream, a branch of which passes through the Azores.

On the weather, conditions of central Europe and maximum barometric pressure around the Azores play a significant part. The countries along the Mediterranean are completely within the influence of the Azores maximum and have for this reason excellent dry weather. Frequently the high pressure region in the summer spreads even farther to the north, under which



circumstances all of central Europe comes under the favorable influence of the Azores maximum.

At the time of their discovery, the Azores were uninhabited; today about 230,000 Portuguese are counted there, and before the World War this figure was somewhat higher. The density of population is 100 per square km.

Trade with the Azores is small, but for this reason the through commercial traffic is all the greater. In time of peace the Azores have regular steamship connections with Lisbon, Le Havre, London, and Hamburg. In addition to this traffic, in the course of a year hundreds of ships move between the islands of the group. Modern air travel has given the Azores new significance as an intermediate landing point. As a cable station, as early as the first years of this century, the Azores already occupied a special position. The central point of the cable system is the small island of Fayal. Five cables meet in the principal city of Horta, which has a population of 7,000; one cable serves the internal Azores, one comes from Lisbon, three go to England, and one connects with New York. The Azores are therefore the most important cable station in the Atlantic Ocean.

In the (first) World War the United States of America occupied the Azores as an ally of Portugal, set up there an important fleet and supply base, and conducted many of its major actions from that point.

Surprise Fires With the Observed Fire Chart

By Maj. Ulrich G. Gibbons, FA

Development of the observed fire chart has presented field artillery with a ready, rapid means of massing artillery fire before laborious and time-consuming survey can be completed. The principal drawback to this form of firing chart, however, has been that, since target locations are determined by adjusting one battery, surprise is sacrificed—with a resulting decrease of effectiveness of the fire for effect. A method of target location which did not involve adjustment but which was yet fast enough to permit rapid massing of fires would vastly enhance the effectiveness of the observed fire chart.

Such a method has been developed and thoroughly tested in the artillery of one division, with entirely satisfactory results. The basic principle is that of the survey short base, with certain refinements to produce speed. By using this method surprise fire, without adjustment, has been brought on a target in an average of less than five minutes (sometimes less than three minutes) after the target was observed at the OP.

At the battalion OP a base is selected, not over 300 yards in length and, if possible, in a direction perpendicular to the general line of fire. Length limitation of 300 yards is indicated because with longer bases the observers at opposite ends do not see objects in the same relative positions, and rapid mutual identification of targets is very difficult. Personnel of the battalion survey section set up and man aiming circles on each end of the base, install telephone communication between the two parties, and then locate themselves with respect to the base point.

The left observer, whose instrument we may call the principal instrument, measures the compass to the base point (e.g., 800 μ). Then, orienting his instrument along the base extended to the left, he measures the clockwise angle to the base point (angle A) while the right observer at the secondary instrument measures the clockwise angle from the base to the BP (angle B) and communicates this data to the principal instrument. Knowing the length of the base, and solving the triangle for angle C, the distance PI—BP can be determined. Use of a short base slide or short base tables will speed up this operation. Now, using the back azimuth to the BP ($3200 + 800 = 4000$) and the determined

range, FDC can plot in the PI on the firing chart. For future plotting of targets FDC may use either the base line extended or the PI—BP line as a reference direction.

Our short base is now ready for operation. When either observer sights a target he identifies it by telephone to the other observer. Principal and secondary observers then measure angles A and B respectively (measured this time to the target). The PI observer reports his measured angle to FDC and, after solving the triangle as before, the range PI—target. Plotting by polar coordinates from the plotted location of the PI, the HCO locates the target and gives data to the guns, and the battalion fires volley fire. The entire process, including identification of the target by both observers, can be streamlined down to take less than 5 minutes' time.

Some limitations may be pointed out. Actual firing experience has indicated that when the range is so great that angle C is less than 50 μ an inaccurate target location results. Hence, by the mil relation, the base becomes too inaccurate for surprise fires at around 6,000 yards, even when the direction of the base is normal to the line of fire. Frequently the base will be so inclined to the direction of fire that the minimum intersection of 50 μ is reached at much shorter ranges.

Further, with angles less than 150 μ there is sufficient inaccuracy that firing the battalion with a 1-c range spread between batteries is desirable for positive coverage. On any doubtful intersections the practice has been followed of firing one battery volley, the observer making an instant sensing to the FDC, and the battalion then firing for effect.

Repeated firing with this method, however, has satisfactorily proved its effectiveness for delivering surprise fires rapidly with the observed fire chart. The overall time of 5 minutes is equal to the time required for adjustment and fire for effect by a skilled observer. In comparative tests on the same target no observer bettered the time of the short base, while in some cases his time was twice that of the base—and firing with the short base brought not just one initial round in the vicinity of the target, but 12 rounds on the target hitting for effect.

FDC IN THE JUNGLE

By Maj. John R. Crossen, FA

Nearly all observed fires in the New Georgia jungle were conducted by forward observation. Due to extremely limited zones of observation smoke was used a great deal, and in many instances bursts were brought by sound sensings to a point where the observer could see them. Even then it frequently became impossible to mark the GT line, as the officer observing might be able to see the jungle-covered Jap dugouts 100 yards in front of him but absolutely nothing else. In many cases sensings of "200 right" or "100 over" were sheer guesses, even when a burst could be seen, because it was found impractical for the observer to visualize the GT line even when he knew the Y-azimuth of that line.

A solution for some cases was developed by having the observer sense by cardinal points of the compass, such as "200 north," which he could easily do after orienting himself. After various experiments we found one quick and accurate method of converting such sensings to fire commands at FDC. One NCO, designated the "plotter," pin-pricks the location of all batteries on a grid sheet. HCO reads off the Y-azimuth of the initial shot to the nearest hundred mils, and a ray is drawn by the plotter on his grid to extend past the edge of the range-deflection fan. The plotter then puts a plotting pin on this line at the announced range of the adjusting battery, e.g., at 6,000.

Now let us assume an actual case where the direction of fire is 5400 μ . The observer reports "200 North." The plotter

(using a coordinate square, and the pin prick at 6,000 for his point of origin) places his plotting pin 200 yards south of the 6,000-yard pin-prick. He then measures the shift for the adjusting battery from the line representing the direction of fire to the pin prick, and announces "Left 26"; he also reads the range to the computer, in this case "5,900," then moves the pin back to the line at the range just fired, or 5,900. (This avoids numerous lines, makes measurement of angles swift, and the few mils' variation between the exact azimuth of the line of fire and the line drawn at the nearest hundred mils does not in this situation introduce inaccuracies that need be considered.)

This second round is sensed "100 west." From the pin-prick at 5,900, the plotter moves the pin 100 yards east, measures the shift and range, and announces "Right 9, 5,800."

All batteries received their initial shifts from the HCO. Non-adjusting batteries followed all shifts announced by the plotter. When the observer reports "Fire for Effect" the plotter reads the range for each non-adjusting battery directly from his range deflection fan.

This improvised procedure supersedes no standard methods of fire, which are good. It does supplement the tools in the hands of the observer, and in battle enabled us to bring battalion fires on strong Jap positions that we had great difficulty in reaching by orthodox means.

Our battalion commander, forward observers, and NCOs of FDC perfected this procedure after considerable experimentation, and then the former ordered it as standard for our "compass sensings."

Intra-Battery Communication

In an Armored Field Artillery Battery

By CPL. MELVIN E. MASON and CPL.
JOE B. WINDLEY, FA

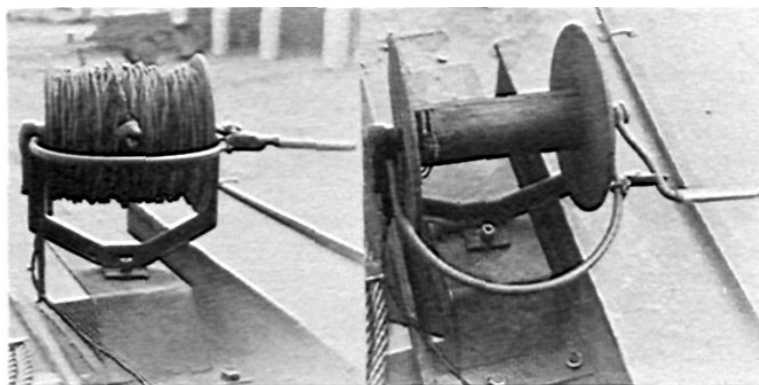
In a normal position the nearest SP 105-mm howitzer to the executive's half-track is fifty yards away, and the farthest is 100 to 200 yards. This makes communication by voice practically impossible. The noise of the 9-cylinder radial airplane engine of the M-7 further complicates any attempt by the executive to use voice communication.

Thus the only solution, to date, is to use wire.

Laying the wire and establishing telephone communication by hand took considerable time. Wire on the M-7 was bulky and in the way. Communication was faulty: movement of the M-7 a few feet nearly always broke communication, so the executive was not always sure that all sections received all commands.

One method tried by Btry A, 47th Armd FA Bn, was to mount a wire reel on the Truck, ¼-ton 4×4, and lay the wire to the M-7s. This was not practical, as it took too much time, and the wire was cut each time you went into position, so it had to be spliced before you moved into a new position.

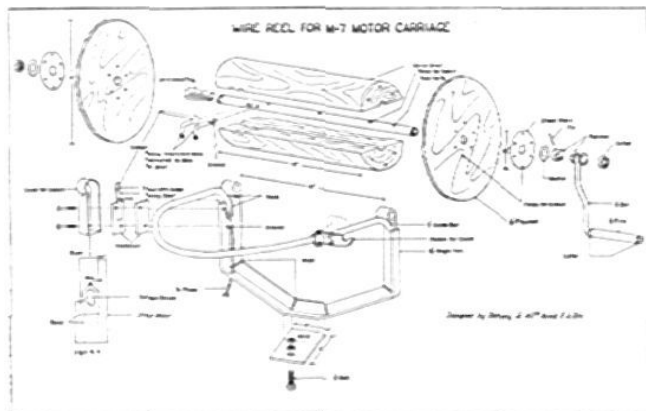
A newly devised reel can be made of spare parts at practically no cost. It consists of a wooden spool with 300-yd. capacity, mounted on a welded metal frame (see drawing). The whole assembly can be traversed 360°, since it is mounted on the M-7 carriage with only one bolt. The reel, comparatively



small, is mounted out of the way on the back deck of the M-7. Best feature of this rig is that the phone of a howitzer section is continually hooked to the reel. This is accomplished by connecting the wires from the phone to a contact at one end of the spool (see drawing) and to a wire that is grounded to the frame. Thus all that is necessary is to run off the wire to the executive's field phone or switchboard (made of common electrical plugs and sockets). When the phone of the howitzer section is hooked to the reel as described above, the M-7 may be moved up to the limit of the length of the wire on the spool without breaking connection with the executive's phone or switchboard. Another advantage is that when "March Order" is given, the plug is pulled from the executive's switchboard and the M-7 moves off with the wire being wound on the spool while the vehicle is under way.

To build the reel you need:

- Base—3" × 4" × ¼" flat iron
- Frame—36" piece of 1¼" angle iron
- Axle—16" piece of ¾" pipe
- Guide bar—36" piece of ½" iron bar
- Crank—12" piece of ½" iron bar
- Crank handle—4" piece of ½" pipe
- Spool—30" piece of 2" × 4" wood; 1' × 2' piece of plywood—¾" thick
- Contact guard, disc, and washers—1" × 1" piece of #10 gauge sheet metal
- Ratchet and collars—4" piece of 1" pipe
- Insulated wire—12" piece of #8
- Insulation—¼" × 8"
- Spring steel—½" × 6"
- 2 Bolts—¼" × 1½"
- 1 Bolt—½" × 1½"



THE BATTERY FDC

By Maj. Roger Wilco

Commenting on or suggesting a method of fire direction other than the present issue model is comparable in these days to a suggestion to "change the name of Arkansas."

This is not a criticism—it's a modification which though originally developed for armored artillery is applicable to all radio-equipped artillery. Basic procedure is unchanged.

The method is based on the following principles:

(a) Batteries shoot their own problems and do not depend on Bn FDC to give them all their commands, thereby reinstating the battery as a firing unit.

(b) FOs work direct with their batteries and not through Bn FDC.

(c) When the battalion shoots, Bn FDC controls the shoot; such battalion fires are always surprise concentrations delivered upon command of the Bn FDC ("at my command").

(d) Adjustment by one battery is completed before the battalion is taken off other missions, thereby eliminating the procedure wherein two batteries await the adjustment of one battery.

(e) Data sent to a battery is *adjusted data*, no corrections are sent later.

(f) Length of transmissions to a battery is reduced to a minimum (about 100 words, including call ups, are needed for a battery mission, about 150 words are required to fire a battalion mission).

(g) Annihilation of Bn FDC will cause but slight delay in the delivery of battalion fires.

(h) Commands are not sent to batteries—merely target locations with respect to each battery's own base line, and the method of fire.

(i) Batteries and battalion each have computers, one in each executive's car and three adjacent to the Bn S-3 at Bn FDC.

COMMUNICATION

As with all centralized fires, this is the backbone. Without good, rapid, concise, dependable communication, no system is worth a damn. The radio and/or telephone operator is the key man. He should be a sergeant, not a basic; and furthermore a sergeant versed in fire direction as well as communication.

The radio net is similar to one that appeared in last January's issue of the JOURNAL. A set with two receivers is with the battery executive; one receiver is set on the battery channel, one on the Bn FD channel. The receiver on the battery channel is switched to "interphone" and the speaker to "on." The receiver on the Bn FD channel is switched to "radio" and the speaker to either "on" or "off." The battery plotter wears a headset plugged into the Bn FD receiver. The computer listens to the speaker of the receiver set on the battery channel. The radio operator must be on his toes and listen to the speaker with one ear and wear one phone of a headset connected to the other receiver. Changes of transmitter channels are not excessive. The executive may or may not wear a headset.

The Bn FD net consists of a receiver with each executive, and the Bn S-3. The S-3 wears a headset and gives locations of

targets, method of fire, and the command to fire to the batteries when a battalion concentration is fired. The Operations Sergeant wears a headset; he plots target locations and reads shifts and ranges for each battery. These shifts always are from each battery's base line and base point range, thus relieving the battery computer from the task of computing a shift when the battalion is being fired. The battery computer (at the battery) need only convert the range sent to an elevation—if range drums are used, this also becomes unnecessary.

The radio operator records adjusted data for each battery on concentration reported fired on, and sends this data to batteries during lulls in the firing.

From the above, it can be seen that only a maximum of three men are needed at gun positions or at Bn FDC, including the Execs and Bn S-3.

PROCEDURE

For battery missions the observer, not requesting the battalion, adjusts and fires for effect, the computer converting sensings to deflection shifts and elevations. If range drums are used, an alert executive can do this conversion mentally. After the mission is accomplished the battery reports to Bn FDC (this involves a change in transmitter channels) the concentration number, nature of target, adjusted BD shift, and adjusted range to target. All of the above are given with respect to the adjusting battery's base line and base point range.

Bn FDC plots the target and, as opportunity offers, sends to batteries who did not fire the concentration number, nature, BD shift, and range based on *each battery's base line and base point range*. It is the responsibility of Bn FDC that batteries receive this information even though they may intercept the original transmission.

The result of this procedure is that all batteries are informed of the location of any target which any battery has fired upon, and thus four firing charts are being developed simultaneously. Once this information has reached all batteries, the battalion can fire on any target which has been fired on by any battery. The Bn FDC merely sends the concentration number and method of fire to all batteries; they already have the target location. Batteries also keep a tabulated record of *their* shifts and ranges to all plotted targets in order to speed up such fires.

Type problem:

<i>Observet</i>	<i>Btry on btry net</i>	<i>Btry on Bn FD net</i>	<i>Bn FD net</i>
Fowl 33, this is Fowl 10-BP 500LL 400SS- AT guns-Over	Fowl 33-Conc 55 Wait-Fired-Over		
10-Roger-100RR- Repeat range-Over	33-Wait-Fired- Over		
10-Roger-100 Over- Fire for effect-Over	33-Wait-Fired- Over		
10-Mission accomplished-Out		Fish, this is Fowl- Conc 55-AT guns-RR 75-plus 400-Over	Fish-Roger-Out Mammal this is Fish-data conc. 55- RR 70-Plus 200-AT guns-Over Mammal-Roger- Out Reptile this is Fish-data conc. 55- RR 40-minus 100- AT guns-Over Reptile-Roger-Out

Call names without number are sufficient for FD net, as usually only one station (the Exec's) from each btry is in this net.

For battalion missions the observer adjusts as before, but requests the battalion on his initial sensing. When "fire for effect" is given, the adjusting battery, which has kept a record of its net shifts and range, immediately reports to Bn FDC "Fire battalion," followed by the concentration number, base deflection shift (its own), adjusted range, and nature of target. Bn FDC (S-3) replies "Yes," "No," or else gives a shift to the battery for a different battalion mission. The S-3 knows which observer has priority in battalion fire missions since the battalion commander has given priority ratings to observers based on the instructions of the Division Artillery Commander or commander of the supported unit. The Operations Sergeant, having plotted the target location, reads the base deflection shifts and ranges for the other two batteries in relation to their own base lines and base point ranges. If the battalion is to fire, the adjusting battery should report "Ready." When the battalion has reported "Ready" the S-3 commands "Fire." After the report of "mission accomplished" the S-3 gives the concentration number and nature of target to non-adjusting batteries.

Type problem:

Observer	Btry on btry net	Btry on FD net	Bn FD net
Fowl 33, this is			
Fowl 10-BP			
600RR-400SS- Trucks-Fire battalion-Over	wl 33-Conc 56- Wait-Fired-Over		
10-Roger-100LL- 300SS-Over	33-Wait-Fired- Over		
10-Roger-Over-Fire for effect-Over	33-Wait-Out		
		Fish, this is Fowl- Fire battalion-Conc 56-Trucks-LL130- plus 300-Over	
			Fish-Yes-Out Net, this is Fish-Bn mission-3 rds AMC-Mammal RR15-minus 200 Reptile LL90-plus 200-Over
		Fowl-Ready-Over	Fish-Roger-Out Mammal-Roger- Out Reptile-Roger- Out Mammal- Ready-Over Fish-Roger-Out Reptile-Ready-Over Net, this is Fish- FIRE-Over

	33-Firing for effect Over	Fowl-Fired-Out	Mammal-Fired-Out Reptile-Fired-Out
10-Roger-Mission accomplished- Out	33-Roger-Out	Fowl-End of mission Over	Net, this is Fish- End of mission- Conc. 56- Trucks-Out

With a little practice battery and battalion fire direction crews can fire the battalion in less than a minute after fire for effect is given. To the objection that this is too long a time, the answer is that a target worth firing a battalion on is not going to move from the area of a battalion concentration in a minute. If it is a moving target, fire can be controlled more effectively by firing one battery with corrections after each round.

Destruction of the Bn FDC merely means that one of the battery fire direction crews takes over battalion fire direction with the survivors of the battalion crew to assist. During actual firing this has been done with practically no delay in delivery of fire, even when a battalion mission was being fired.

The installation of direct wire lines from FDC to guns merely means that the Bn FD radio net can close down. Fire missions may be continued over wire the same way as over the Bn FD radio net, or computers can send commands to the guns directly.

In actual practice code ranges, compasses, charges, and sites are used, to prevent intercept stations from locating battery positions too easily. Actual compasses, ranges, etc., are sent over radio by indicating them as right or left so much, plus or minus so much.

A handy wire net for simulating radio nets can be used for training by having three phones on each of three party lines. These phones represent the forward observer, BC, and Exec. Another party line of four phones represents the Bn FD net of the three battery executives and the Bn S-3. Radio procedure is used throughout.

If information is desired from the FO's or direct communication is required, any set may change to the battery channel on which the FO is working and contact him direct.

High burst or CI adjustments or shoots by higher authority are easily handled by putting observers and batteries and Bn FDC on the same channel, usually the Bn FD net.

This system is primarily designed for rapid offensive action. For defensive action highly centralized control and the usual procedure are obviously more applicable. For rapid offense, partial decentralization and the procedure outlined above have proven very efficient in truck-drawn as well as armored artillery battalions.

OBSOLETE VISUAL AIDS

Recently the following visual aids have been declared obsolete:

Training Film

18-1115—Tank Destroyer—Selection of Position

Film Bulletin

64—Tank Destroyer—3-Inch Motor Carriage, M10

Film Strips

6-2—Field Artillery Wire Communication—Telegraphy

6-9—Field Artillery Prime Movers and Vehicles

9-46—Motor Vehicles Inspection and Preventive Maintenance, Servicing—Part I—Preventive Maintenance After Operation

THE FIELD ARTILLERY PUTS ON ARMOR

By Lt. Col. Douglas G. Dwyre, FA



Teamwork blasts the target.—To build a smooth-functioning team, the key men in each M7 are kept together throughout training and are given endless drill, often with service ammunition. Here the section chief, gunner, and No. 1 cannoneer cooperate to lay the howitzer on the target.

The Armored Field Artillery Battalion rolls into action, with big track-laying howitzer carriages crashing through brush and timber, spanning gullies, swinging into position close behind the first wave of tanks, ready in a matter of minutes to lay crushing fire on the enemy vehicles and installations visible ahead. Only a few months ago this same battalion hitched its 105s to 2½-ton trucks, dug them in well behind the lines, and delivered fire at 6,000-yard range over the heads of advancing infantry. This change from a mechanized to an armored battalion involved reorganization of the firing batteries, adoption of new equipment, a fundamental revision of tactics, and the retraining of all personnel. The end result is a battalion with a more powerful punch and greater maneuverability, ideal support for the tanks and armored infantry in combat.

It is the M7, a 105-mm howitzer on a medium tank chassis, that gives artillery new mobility, enabling it to follow the tanks over terrain that would be impassable to truck-drawn 105s. Self-propelled artillery is not new, but the M7 has important advantages over its predecessors. It is a 23-ton, full track-laying vehicle, the equal of the tank in covering rough ground and crashing through to its objective. It has armor that protects the crew from all small arms and most machine gun fire. It is largely self-sufficient, for there is room in the vehicle for the crew necessary for operation of the weapon,

and all essential equipment. Even while firing, the Chief of Section, gunner, driver, and Nos. 1, 2, and 3 cannoneers are inside, protected by armor. A good load of ammunition is carried in an armored trailer and so, if the M7 gets within range of the enemy, it has all it needs to go into action.

The M7 provides no greater speed on the road, but it obviates the necessity of coupling and uncoupling the howitzer. It permits doing during movement much that in the past needed to be done before the 105 could be budged. Thus the M7 provides

an ability essential to safety in the front lines — the ability to move at a moment's notice, to pull out within a matter of seconds when enemy fire locates the position.

In the old



Armored artillery is still artillery. Whatever the means of transporting it to the firing position, it is still a 105-mm howitzer that delivers the punch, Armor and self-propelled mount merely enable it to take up positions where it will be most effective in support of tanks and armored infantry.

A Discussion of the Changes Necessary When a Mechanized Artillery Battalion Adopts Armored Equipment and Tactics, with Special Attention to the New Emphasis in Training

days of long-distance action, skillfully-devised camouflage provided an important degree of protection, but armored artillery, like the tanks it supports, depends chiefly on mobility for protection against counter-battery. The second half of the old principle of "fire and movement" has taken on new meaning and importance. All advantage is still taken of available cover and defilade, but often, due to the speed of the action in which armored artillery is involved, cover must be sacrificed for speed. As soon as a battery occupies a position, its six howitzers (compared with four in the old battery) taking a hexagonal formation, the executive sets out to select at least one alternate position from 300 to 800 yards away. Since he has more time to reconnoiter, the new position frequently is better than the original choice. If it becomes evident that the battery will remain in the general locality for some time, it is often desirable to use a lull in the firing to move to the alternate position. The long-distance slugger of yesterday is developing some tricky footwork.

An old battalion starts with one tremendous asset: a body of physically tough men, well grounded in the fundamentals of artillery operation; a group of trained specialists who know how to get a howitzer into position, who get their rounds off with speed and precision; sections of observers who have learned the multiple tasks of advance under fire, observation, communication, and direction of fire. But these veterans have to go back to school to learn new tactics, to handle new equipment. They find that armored field artillery is still field



HE for training.—Every opportunity is taken to give the men experience with service ammunition. Firing on the range provides both officers and enlisted men the opportunity to exercise familiar techniques and to gain smoothness in the handling of new equipment.

artillery, but with a speed and daring that require new emphasis in the training program.

The new equipment and tactics place greater responsibility on the non-coms in each firing section. The driver and his vehicle were always important, but in the old days a disabled truck could be replaced with any other available 2½-ton 6×6 and the howitzer rolled on to complete its mission. In the M7, however, the 105 and its vehicle are inextricably wedded, and mechanical failure of the vehicle reduces a powerful weapon to impotency. Even a large shift in direction of fire is impossible without movement of the vehicle. As a result, the driver must learn to a precise degree the capabilities and limitations of the M7, and be trained so that he will never have his vehicle laid up due to his failure to carry out his proper maintenance.

A man who was proficient in driving a heavy truck and hauling a 105 is potentially an excellent M7 driver, so he finds that his assignment has not been changed. First step in the training is introduction to a half-track, which gives him some notion of the superior traction of the track-laying vehicle. When he moves into the M7 it seems clumsy and unwieldy. It won't swing around as sharply and easily as the old truck, and precision in maneuver seems an impossible goal. But the driver learns fast, moving up by carefully-graduated stages from simple driving on level ground to the ditches, brush, mud, and trees that will be his major terrain obstacles in the field. The competent truck driver, who started with doubts, comes out after only 10 hours of intensive training with full confidence in the capabilities of his new vehicle and considerable skill in its operation.

Throughout the training of the driver emphasis is laid on selection of terrain. After all, the object is not to demonstrate constantly the prowess of the vehicle, but to take the easiest practicable course and use that prowess only when necessary to put the howitzer in position to accomplish its mission.

Unmixed blessings are rare and the M7 is not the happy exception. In a large shift of direction of fire the old 105 could be swung around easily without altering the position of the sights, but with the M7 the driver must pull the entire vehicle out of position and bring it back so that the sights are over the same spot but with the howitzer tube pointed in the desired new direction. The angle of traverse is small. This requires a high degree of skill and teamwork on the part of driver, gunner, and section chief if it is to be accomplished with speed and precision. The only answer is drill, drill, and more drill.

It has been found advantageous to keep the team of chief of section and driver together throughout training and action. They learn to work together, to understand each other's signals, perhaps to devise individual signals which work better for this particular team than the standard movements. "I can tell by the position of his hands and the expression on his face," one driver said, "whether I've got three feet or five feet to go." In every movement it is the chief of section and driver that maneuver the vehicle, and a skilled team provides the speed and accuracy that get in the first death-dealing punch in the open battle of fire and movement.

Forward positions increase the likelihood of direct laying and the probability of fire on moving targets. In both cases the responsibilities of the chief of section are increased. In indirect fire this sergeant merely follows orders from his superior officers—a not inconsiderable task—but with direct laying

and moving targets he must act frequently on his own initiative and judgment. In field artillery as in other branches of service, armored, high-speed warfare has intensified the need for highly-trained, resourceful non-coms.

Even the experienced howitzer crew must embark upon a course of continuous drill if it is to become expert in delivering fire from the M7. There is somewhat less room to work and, in the case of some of the cannoneers, positions are different. Thus the old team goes to work again to regain the automatic ease of operation that characterized its former performance. Training starts logically with the individual, who learns his function thoroughly. Then come section drill, coordination of sections in the battery, and finally, the massed fire of the battalion—the final objective, the crushing weight of fire upon the chosen targets.

Armored artillery, as a front-line unit, must expect greater casualties, and the section team must learn to carry on even if a key man is wounded. To accomplish this end every man is taught to "double in brass," to take over another's task and continue his own. Nothing is left to chance; regular assignments are given and "short" crews are drilled in the heavier battle duties. The sections drill endlessly with dummy rounds until they could do the job nearly as well with their eyes closed, which would be a close approximation of visibility conditions in the smoke and murk of battle. Every opportunity is taken to give the men experience with service ammunition and, when 105-mm ammunition is not available, sub-caliber devices are utilized. There is no substitute for gun drill and actual firing.

When the artillery sped forward from safer positions behind the infantry to the turmoil of armored battle, it made new demands upon its men. No longer could they depend on the units they supported to protect them from enemy raids. Security became the job of the battalion, the battery, and every individual man. A war of swift movement provides constant danger of attack from flank or rear, and the battalion must establish a complete perimeter defense, making its position a fortified island on the turbulent field of battle. The chief defenses are provided by such weapons as the M6s (self-propelled 37-mm antitank guns) and by half-tracks mounting .30-cal. and .50-cal. machine guns. Every battery places its machine guns in position to meet the sudden forays of enemy troops and, as a last resort, every man but the medic is ready to turn from his job and protect himself and his equipment with small-arms fire.

Two-thirds of the personnel of the battalion are armed with sub-machine guns, the rest with .45-cal. pistols, and every man must know both weapons. He learns to assemble and disassemble his gun, correct stoppages, keep it in condition. He fires a qualification course with his primary weapon and a familiarization course with the other. If training is properly rigorous and thorough he learns to throw the tommy-gun to his shoulder and hit the bobbing silhouette targets with nearly every shot. In one battalion more than 70% of the men qualified as expert with the tommy-gun and not a single man failed to qualify.

The fighter plane and dive-bomber have added their screaming assault to the terrors of the battlefield, so to complete its security measures the artillery must look skyward. Every M7 is equipped with a .50-cal. machine gun, mounted on a circular rail in such a manner that the No. 1 cannoneer can

swing it easily for fire in any direction at any angle. Every man in the crew is trained in the use of this weapon in antiaircraft fire and all are instructed in the identification of aircraft. The training film has proved highly effective in teaching men to recognize vehicles and weapons of land and air. In fact, the training film is valuable wherever a subject otherwise would be handled by lecture.

As a front-line fighter the artilleryman requires the same individual battle-training given the tankner and the infantryman. He crawls through an infiltration course studded with rock and crossed with barbed wire, with machine gun bullets whizzing just overhead and land mines exploding near enough to deafen him and shower him with mud. He learns modern street and house-to-house fighting, firing his tommy-gun commando style. As a member of his howitzer team he gets experience in swift fire and movement, using live 105-mm ammunition on a rugged battle-firing course.

With experienced men, training under simulated battle conditions is desirable as soon as they have mastered the new equipment. The battalion goes out on frequent overnight problems. While firing on the range the area sometimes is filled with tear gas, requiring the men swiftly to put on their masks and continue their duties—as they must in battle. Accurate sighting is difficult with a gas mask on, and there is no substitute for practice.



Antiaircraft defense.—It is primarily the duty of the No. 1 cannoneer to man the .50-cal. machine gun in case of air attack. Stationed under the circular rail on which the gun is mounted, he can swing the weapon easily to any angle or direction. Every man in the crew, however, is trained in the use of the gun and in identification of aircraft. In this picture the gunner, No. 1, and No. 2 continue their work with the howitzer while No. 3 rushes over to man the anti-aircraft gun.



Intra-battery communications.—A reel of wire on the M7 can be unrolled swiftly to provide almost instant communication with the executive's vehicle. The greater dispersion of howitzers in modern armored tactics requires telephone communication where direct voice commands were possible previously, and radio where wire was formerly used.

Best training of all is the concentration of all the noise and interference of battle on a howitzer firing range. Smoke, gas, machine gun fire to represent attacking enemy patrols, land mines to simulate counterbattery—all are blended into a nerve-racking spectacle. And through it all the howitzer crews must lay accurate fire upon their targets while other men of the battery repel the flank attack. All of this is in line with the modern practice of conditioning men to battle before they are called upon to face the aimed fire of the enemy. The artilleryman who has moved thousands of yards closer to the center of battle should have this training.

Changes in tactics have brought other problems which affect the transformation of a mechanized artillery battalion into armored field artillery. The open, forward position requires greater dispersion of the firing batteries and of the howitzers within each battery, and this brings greater difficulties in communication. Previously, telephone wire provided satisfactory communication between batteries and battalion, and the four 105s in each battery were close enough together to make the transmission of fire commands by voice a simple matter. Today the battalion places its dependence in radio while the firing battery turns to wire. A reel of wire on each M7 can be unrolled swiftly to

provide almost instant communication with the executive's vehicle. The executive, in turn, has radio contact with the battalion FDC and the battery OP. Communications throughout the armored field artillery battalion are primarily by radio, wire only being used as a secondary means of communication in case the radio for some reason cannot be used.

The switch to radio means training of additional radio men. Use of voice rather than code simplifies things, but still the men must know radio operation, maintenance, and procedure. The principal task has been to hammer home the importance of proper procedure in transmitting messages, and the value of reducing each message to a clear, concise minimum. The T/O does not call for substitute radio operators and yet, obviously, an operator cannot be on duty 24 hours a day; also, the possibility of casualties is always present. The solution has been to give radio training to the drivers of the half-tracks that carry the communications equipment.

No men in the battalion need more varied training and more thorough conditioning than the forward observers. The battalion has three FO sections, each with one officer, one sergeant, and seven privates. Every man in the section, whether he is a truck driver, radio operator, or scout, is trained in all the duties of a forward observer. Casualties may be heavy and each man must be ready to step into his officer's shoes and direct the fire of a battery or of the whole battalion. He must be qualified as a radio operator, specially trained in identification of armored vehicles, expert in map and aerial photo reading. He must know the capabilities and limitations of his howitzers and how to direct their fires.

The forward observer learns to advance on foot and to use the vehicles of his section (a half-track and a ¼-ton amphibious truck), but when his M7s are supporting tanks he must learn to be a tanker too. Usually the supported tank unit assigns him one tank in which he rides into combat with the first wave. This vehicle is indistinguishable from the rest, else it would be a special target for the enemy. The observer should familiarize himself with tanks in training so that he can function in one with confidence and efficiency in battle.



Pass the ammunition.—The M7 is largely self-sufficient, for there is room in the vehicle for necessary crew and equipment. A good load of ammunition is carried in an armored trailer and so, if the M7 gets within range of the enemy, it has all it needs to go into action. Here men are unloading shells from the trailer and carrying them to the M7, where No. 4 cannoner will prepare the charge and hand the rounds up over the side to No. 3, who sets the fuze.

BEWARE OF OVERLOADS

Loading plans have been worked out for all types of Field Artillery units. These take into account not only T/Os and T/Es, but also the capabilities and limitations of the various vehicles. Unfortunately, these plans do not always get on down to the using organizations, who then have to experiment considerably in an effort to devise a workable loading plan without having the benefit of knowing what others have done.

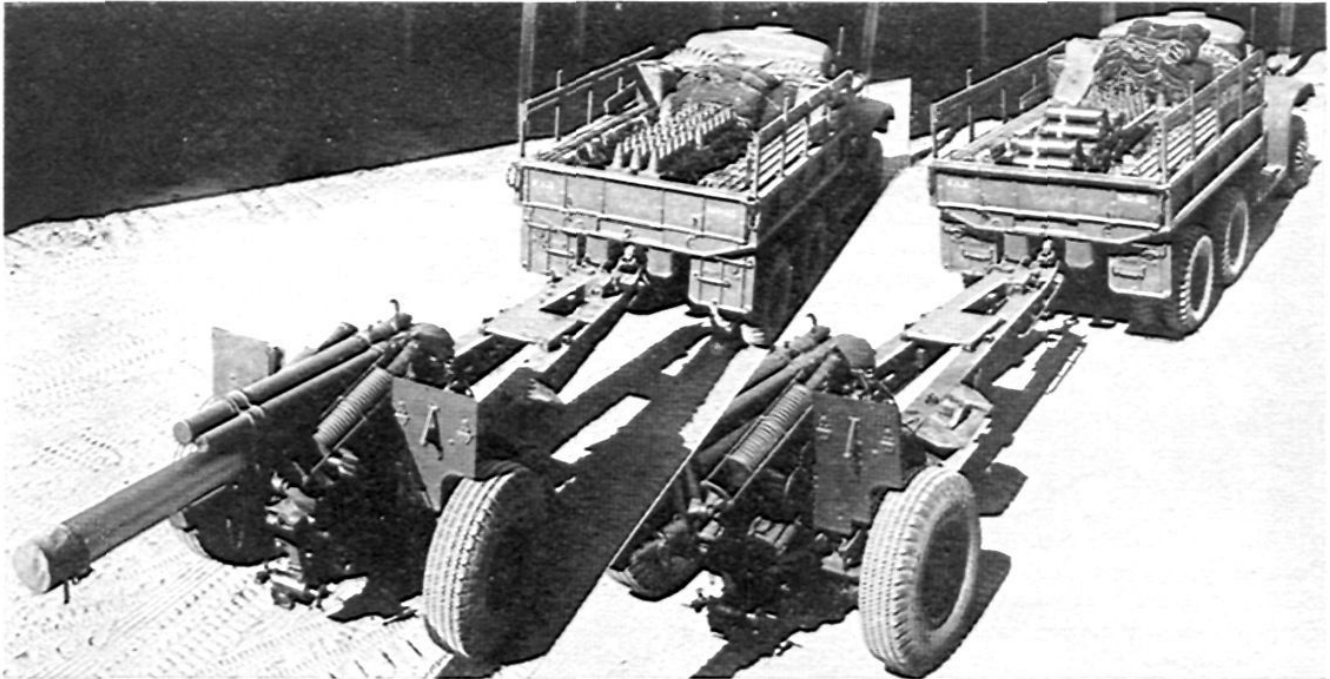
One such instance was related on page 664 of the September JOURNAL, where suggestions were made for loading the 4-ton prime mover for the 155-mm howitzer section, which vehicle has an allowable front axle load of 6,900 lbs., as limited by tire load capacities. It has been pointed out that the Field Artillery Board's loading plan for this unit differs from the published one only in that the projectiles and ammunition frames have exchanged positions with the clover leaves containing the powder charges (see photos, in which barracks bags are omitted). As read on scales, weights (in pounds) resulting from the two methods are as follows:

	<i>Front Axle Loading</i>	<i>Rear Bogie Loading</i>	<i>Total</i>
As previously described:			
Howitzer not coupled	8,200 ¹	16,860	25,000
Howitzer coupled	8,110 ¹	17,820	25,500
As recommended by F.A.B.			
Howitzer not coupled	7,190 ²	17,800	24,851
Howitzer coupled	6,850 ²	18,360	25,100

¹In excess of allowable 6,900 lbs.

²Does not constitute an overload.

Moving the center of gravity of the load forward by placing projectiles and ammunition frames against the vehicle cab, places a considerably greater strain on the steering mechanism and also furthers the tendency of the front end to sink in soft ground. So, whether you are armed with this weapon or with another, keep your vehicles' center of gravity to the rear since the rear bogie has eight wheels and therefore four times the flotation of the two front wheels.



4-ton 6x6 prime mover for 155-mm. howitzer section . . .

. . . loaded in accordance with F.A.B. loading plan.

. . . loaded as outlined in September JOURNAL.

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

In compliance with Article VII, Section 1, of the Constitution, notice is hereby given that the Executive Council has fixed 5:30 P. M., Monday, December 13, 1943, as the time of the annual meeting of the Association to be held at the Army and Navy Club, 1627 Eye St., N. W., Washington, D. C.

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



Ottawa River and the Laurentians, as seen from Petawawa Military Camp

CANADA'S FORT SILL

Petawawa Military Camp lies on the western bank of the Ottawa River about 110 miles above the Dominion's capital. The reservation has a depth of about 13 miles and stretches some 10 miles along the water; its actual shore line, however, is considerably greater due to bays and coves. The inevitable river flat ends abruptly at a 100-foot cliff, beyond which stretches well timbered sandy soil, well dotted with lakes.

The camp proper runs to the brink of the precipice, along the rim of which are built the several officers' messes. In accordance with English custom these combine the functions of an officers' club and of a mess as we know it. Each has comfortable lounges with large fireplaces and a long porch or terrace overlooking the island-dotted river and the Laurentian range 8 miles away.

Petawawa has matured greatly since it was first used as a training site in 1905. Around 1910 a few permanent buildings were erected, but until the present war there was little here except a large tent city erected annually by the Permanent and Non-Permanent Forces.

Now, however, in addition to camp headquarters it contains two Artillery Training Centers (A.1 and A.2), an Engineer Training Center (A.5), and the Canadian Artillery School (S.2). These are termed advanced training centers, as both officers and enlisted trainees have had basic training in their respective statuses before being assigned here. The term "advanced," however, actually means only that officers and men receive here their first specialized artillery instruction; it refers more to a distinction from "basic" training than to an advanced degree of artillery proficiency. All Centers are well equipped. Impact and maneuver areas are excellent. Moving target ranges and concrete dugouts have been provided.

SCOPE OF OFFICER TRAINING

This initial artillery training is given to officers destined for all types of artillery service other than coast defense. Standards required are that officers of all branches will:

1. Be able to perform the duties of a Section Commander (Field) with the exception that a detailed knowledge of advanced technical gunner (such as air burst ranging, calibration, survey other than simple bearing and distance, datum and witness point procedure, etc.) is not required.

2. Have a general knowledge of the tactical handling of a battery of Field, Medium, and Antitank.

3. Have a thorough knowledge of maintenance of motor transport, including the use of vehicle log books, work tickets, road accident reports, inspection reports, and daily maintenance tasks.

4. Be able to drive and maintain the normal types of military vehicles.

5. Be trained in range discipline for small arms practice, including machine carbine and pistol.

6. Reach a high standard of aircraft and tank recognition.

7. Be trained in general artillery signaling, to include (a) working knowledge of radio telephone procedures; (b) working knowledge of current wireless sets in use, their faults and remedies; (c) sufficient knowledge of line circuits to be able to spot and check common faults; (d) knowledge of Morse code; it should be left to the individual officer to achieve a reasonable standard in the transmission of messages by key.

Upon completion of their courses at the School of Instruction, officers (with the exception of AA officers) are attached to the appropriate Field, Medium, or Antitank training battery. Length of service under this attachment depends upon reinforcement (replacement) demands. During this period officers carry out the duties of Section Commanders in both training and administration. This training includes considerable practice on miniature Vaudrey or pellet ranges so that officers may reach a standard of antitank laying (direct crosser) of 40% for Field and Medium officers and 60% for Antitank officers.

Each Artillery Training Center has a capacity of about 5,000 (of whom 5% to 15% are usually officers), and is organized on substantially the same pattern, although only A.1 deals with survey. Its Survey Wing primarily trains enlisted men but is gradually increasing its scope. For example, it is now working on the problems of field calibration, and is closely in touch with the Army Technical Development staff in Ottawa in the development and field use of photo-electric calibration devices. Both Centers train cooks and drivers, and "trade trainees." These latter, who include signalers, mechanics, and clerks, receive their basic artillery training at Petawawa, then are sent elsewhere for their specialized training, and return to A.1 or A.2 for advanced training in which their skills are applied to artillery procedure.

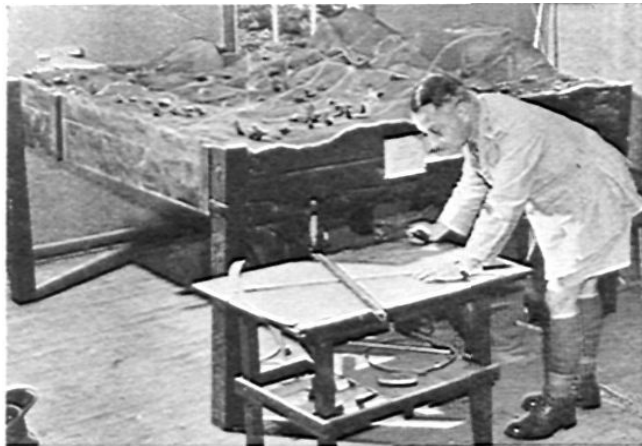
MINIATURE RANGES

Special training equipment of the Centers includes highly efficient miniature smoke puff ranges. In both cases a physical (rather than chemical) smoke is used. Tightly closed cans hold some oily rags, in which is a small electric coil; the resultant smoke is forced out by a puff from an atomizer bulb or from the mouth. A.2's range is semiportable. Immediately adjoining it is a small control table bearing a map of the landscape, with an arm and are like an "artillery board." When this is set up for a given gun position, "shots" are plotted on the control table. Moving the swinging arm pivots the smoke tube beneath the table. An index permits proper placing of the smoke tube along the "smoke arm." By pulling a cord the smoke aperture is raised against the landscape, and a squeeze of the bulb projects the smoke realistically up through the landscape.

For A.1's considerably larger range, part of the floor of a building was raised. The highly elaborate landscape has been wired so that the flash of enemy batteries can be simulated. Results of firing commands are converted into coordinates; the operator rolls his table to the correct point, raises the smoke tube against the landscape, and blows into a tube to project the smoke. This system allows more flexibility in location of gun positions than does A.2's, as there are no arbitrary restrictions forced by a board and no delay in setting up the control table. On the other hand, all commands must be converted to yardage changes and, for accuracy, converted to coordinates.

SCHOOL OF ARTILLERY

The Canadian School operates somewhat as a combination of our Field Artillery School and Field Artillery Board, to which is added some of the duties formerly performed by our



A.2's Smoke Puff Range, showing arm-and-arc arrangement, pivoting of smoke arm, and convenience of atomizer bulb.



A.1's Smoke Puff Range

Office of the Chief of Field Artillery. Its main functions are to:

1. Interpret for and advise the National Defense Headquarters concerning details of technical and tactical developments for field army artillery (except AA).
2. Through National Defense Headquarters, supervise and coordinate artillery training (except Coast and AA) in Canada.
3. Conduct technical and tactical courses for officers in field regiments, training centers, and officers' training centers.
4. Prepare *Notes on Artillery Training*.
5. Make technical reports as required.
6. Conduct trials for the Master General of Ordnance.
7. Prepare syllabi.
8. Prepare technical and tactical exercises.



Mechanism beneath A.1's Range

One would expect to find a rather sizable staff busy on these manifold duties. As a matter of fact, however, one lieutenant colonel, as Chief Instructor in Gunnery, assisted by two Gunnery Instructors of field rank and a handful of permanent assistants (enlisted and civilians), carry out all this work. A most able officer is in charge, and definite progress is being made.



ITALIAN 105/28 HOWITZER

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

Late in 1918 the Italians adopted a French Schneider 105-mm howitzer with an extremely long tube. This model was subsequently made at the Ansaldo Works, big artillery shop for the Army. The Libyan campaigns yielded to the British a vast assortment of captured Italian artillery, and among such booty was a high per cent of these 105-/28-mm* pieces. This weapon being one of the best pieces the Italians had, the British selected it for certain typical artillery tests under British procedure.

A brief explanation of British calibration theory, which is possibly open to debate, will help one to understand this test. On the one hand the absolute accuracy of a piece is determined versus the theory behind the 50% zone. On the other hand this accuracy is only determined and confirmed at recurring intervals of the tube life versus a heavy ammunition expenditure, with additional tube wear.

For years our British comrades have always established a factor to be added to all their artillery range tables to compensate (by correction in elevation) for the loss of muzzle velocity due to wear. Each battery (our battalion) commander would calibrate at least one of his unit weapons, and then determine how the remaining guns of the battery shot in comparison. This calibrating is done by actually finding out where the shells fall, as per range ring settings of the piece. If over or short for a setting, a permanent correction is made to

the range ring so that the piece should shoot to the settings calculated by the battery commander. The other pieces of the battery are similarly corrected, so that the battery will fire uniformly. All this is obvious; as the gun tube wears the muzzle velocity falls, and to continue to hit the area desired the tube must be elevated additionally to compensate. Naturally, projectile weights and powder charges must remain the same.

The School of Artillery in the Middle East undertook this problem as a training program. Hence, after two of the captured Italian 105/28-mm pieces had been overhauled by the M. E. Ord. Shops, they were taken to the school artillery ranges. Serviceable enemy ammunition was drawn from the thousands of captured tons on hand. The purpose of this test was to determine the accuracy of these two 105/28-mm weapons, under standard British calibration procedure.

A point noted by this observer was that often the Italian artillery piece was better than its ammunition. This was often revealed in the desert, and it was quite evident in this case—which revealed that the weapon shot well but the shells had a high percentage of fuze failures.

Data sheets were kept by School instructors, while the pieces were served by student personnel. Following the principle that an adequate number of rounds be fired in each zone, observers at the recovery field were able to check the accuracy. Both weapons were found to shoot quite accurately.

This picture is not complete without a brief description of the ammunition used. The Italians provide two basic types of HE shells, which show both French and German influence.

*Italians always give the caliber of their artillery tubes followed by the caliber length, expressing it in this case as 105/28 to mean a 105-mm tube, 28 calibers long.



Projectiles and propellants are packed separately. Among the latter, 1 cartridge case is issued per 3 complete charges, primers, and detonators; these are assembled in the field, at the battery position. Projectiles are packed 3 per box, unfuzed; top of the fuze plug is removed for screwing in the upper or top detonator.

A gunner loads increments for Zone 3 into the reprimed case. Each roll of powder is one zone's increment.

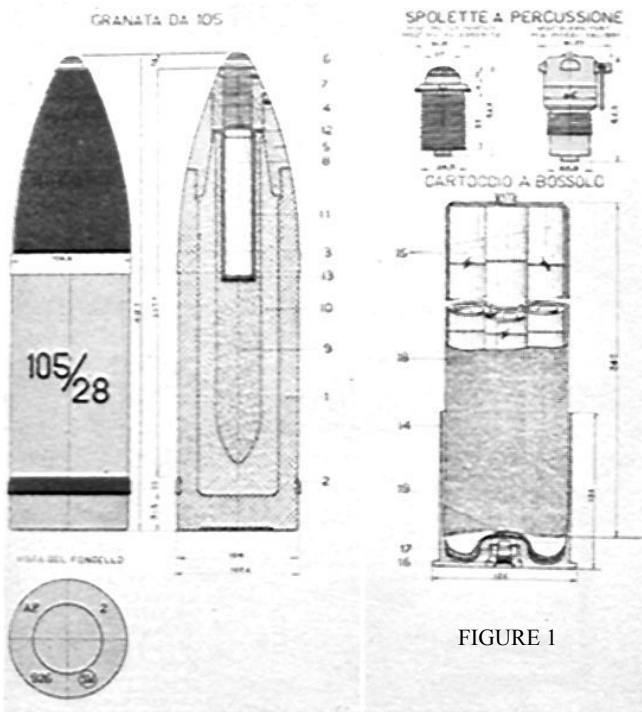


FIGURE 1

The earlier shell is a conventional flat based type of first World War days, the other boat-tailed and of more modern design. This latter, standardized about 1932, is fitted with a combination time and percussion fuze; very few of these seem to have been issued in the desert.

The early shell (see Figure 1) is made much like the early U. S. 1917 Mk. I HE shell. It comes in two designs. The first is a single forged type of shell, which permits an easy pour method of filling. It uses the conventional type of fuze adaptor. The Italians call this Granata Monobloca da 105. They use Amatol as a surrounding element for TNT in which sits the booster.

The second is the same in exterior, but follows some German influence in that the whole ogive is removable in addition to the adaptor. Under certain conditions this would be a help in filling with Amatol by extrusion. This shell, of cast steel, is called Granata da 105 (see Figure 2). This streamlined shell was not available for this test, but Italian prisoners have stated that their crews liked it very much.

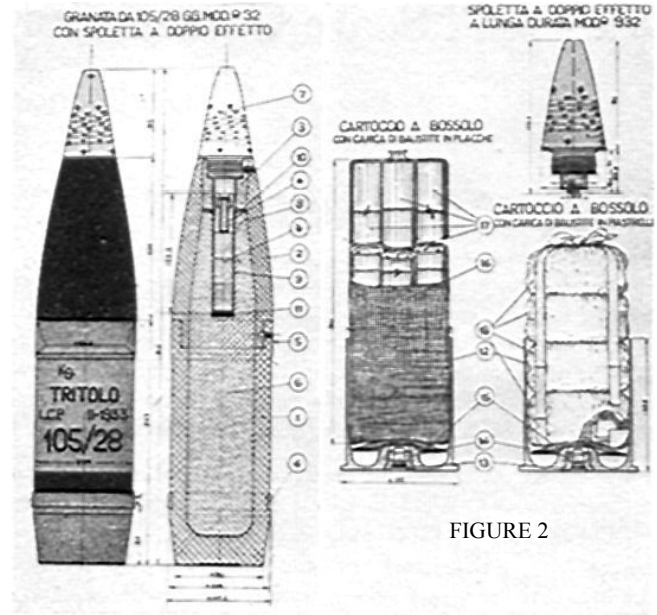


FIGURE 2

The propelling charge for both shells is the same, consisting of double base sheet powder rolled into a stick. Each stick becomes a zone charge. One cartridge case is issued per three shells; the cases are primed in the field. Usually a few extra cases are kept on hand by the gun crews, for rapid service of the piece. During this test it was discovered that these cases could be fired at least seven times.

Maximum ranges for the two shells shown are as follows:

Shell 105/28 w/percussion fuze	
1st zone.....	7980 m
2nd "	9850 "
3rd "	11425 "

Shell 105/28 w/time and percussion fuze	
1st zone (never tried at zone 1 as the fuze will not function)	
2nd "	11215 m
3rd "	13642 "

The advantages of this more modern shell are obvious.

Two other shells exist: a shrapnel (obsolete) and a hollow charge which is reported; little is yet known about the latter.

CAMOUFLAGE—how not to do it! Fish net and dry stalks thoroughly conceal this 155-mm howitzer. But what will happen if an enemy round lands among this tinder? Remember how the Indians burned the early settlers' cornfields? — the same principle applies here. And why is the trailer standing out in the open, instead of being parked in the brush where it would be less conspicuous?



A Scale Conversion Slide for Your GFT

By T/Sgt. Thomas E. Ryder, FA

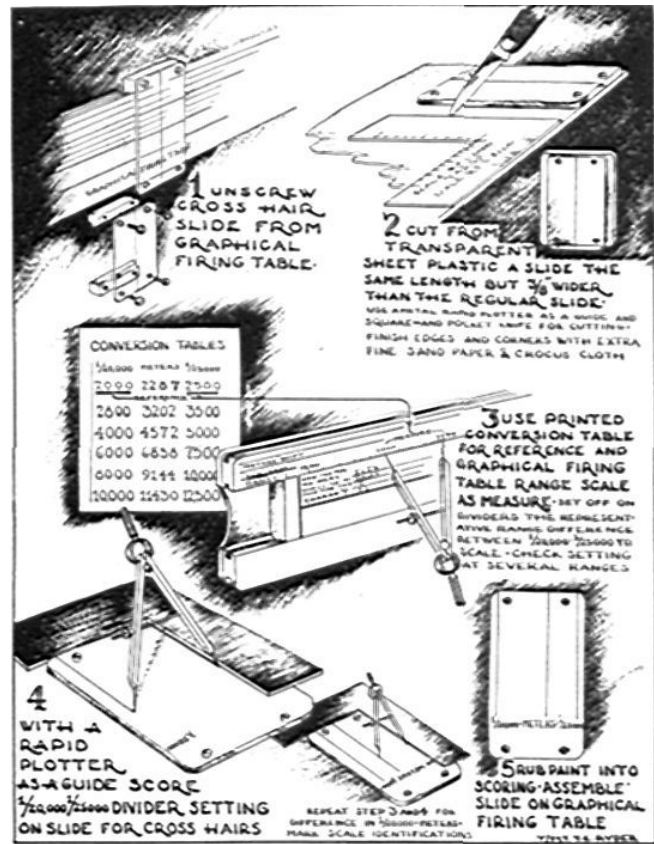
Increased use of the 1/25,000 scale, together with the probable increasing use of the metric scale once large operations start on the continent of Europe, makes a conversion slide for your Graphical Firing Table a worthwhile convenience. Such a slide has many uses. It makes possible the rapid, accurate conversion of one scale to the other. It does away with possible error in arithmetic computation. In FDC it allows for quick conversion of not only range, but also the 100-yard shift, 33 1/3 yards, Elev., c, Drift, and Fuse Setting.

Let us assume a valuable map has been captured. It is in the metric scale. We wish to use it as a firing chart. The HCO has only a 1/20,000 range-deflection fan. He measures ranges (on the new map) with this fan. The computer sets the 1/20,000 crosshair of the conversion slide on the announced range, and reads the metric scale crosshair for all necessary data—100-yard shift, Elev., c, etc.

Similarly, ranges on a 1/25,000 map or chart may be measured with a 1/20,000 fan and graphically converted, or vice versa.

CONVERSION TABLES

1/20,000	Meters	1/25,000	1/20,000	Meters	1/25,000
2500	2858	3125	6300	7201	7875
2600	2972	3250	6400	7315	8000
2700	3086	3375	6500	7430	8125
2800	3202	3500	6600	7544	8250
2900	3315	3625	6700	7658	8375
3000	3429	3750	6800	7772	8500
3100	3543	3875	6900	7887	8625
3200	3658	4000	7000	8001	8750
3300	3762	4125	7100	8115	8875
3400	3886	4250	7200	8230	9000
3500	4000	4375	7300	8344	9125
3600	4115	4500	7400	8458	9250
3700	4229	4625	7500	8573	9375
3800	4343	4750	7600	8687	9500
3900	4458	4875	7700	8801	9625
4000	4572	5000	7800	8915	9750
4100	4686	5125	7900	9030	9875
4200	4801	5250	8000	9144	10000
4300	4915	5375	8100	9258	10125
4400	5029	5500	8200	9433	10250
4500	5144	5625	8300	9487	10375
4600	5258	5750	8400	9601	10500
4700	5372	5875	8500	9716	10625
4800	5486	6000	8600	9830	10750
4900	5601	6125	8700	9944	10875
5000	5715	6250	8800	10058	11000
5100	5829	6375	8900	10173	11125
5200	5944	6500	9000	10287	11250
5300	6058	6625	9100	10401	11375
5400	6172	6750	9200	10516	11500
5500	6287	6875	9300	10630	11625
5600	6401	7000	9400	10744	11750
5700	6515	7125	9500	10859	11875
5800	6629	7250	9600	10973	12000
5900	6744	7375	9700	11087	12125
6000	6858	7500	9800	11201	12250
6100	6972	7625	9900	11316	12375
6200	7087	7750	10000	11430	12500



In survey work the conversion slide might well be used to convert distances in changing the scale of a plot. Or, if the survey section has only a 1/20,000 plotting scale and a metric grid sheet, it can plot correct coordinates by using the GFT conversion device.

HOW TO MAKE THE CONVERSION SLIDE

1. Unscrew the transparent plastic crosshair slide from your GFT (see Fig. 1).
2. From transparent sheet plastic or heavy acetate, cut a new slide the same length as but approximately 3/8" wider than the regular slide. A metal rapid plotter makes a good guide and square. A sharp pocketknife will cut the plastic. Center the regular (or single-hair) slide on the newly cut plastic; mark and drill the holes. With fine sandpaper and crocus cloth round the corners and finish the edges of the new slide. (See Fig. 2.)
3. Using the accompanying conversion tables as a reference and the range scale on your GFT as a measure, set off on a pair of draftsman's dividers the representative range difference between the 1/20,000 and 1/25,000 scale.

Example: Rn 2,800 on 1/20,000 scale = Rn 3,500 on 1/25,000 scale. Place one point of the dividers on 2,800, the other on 3,500. This setting is the representative range difference, and remains constant. The GFT's logarithmic calibration of range takes care of this representative range difference throughout.

Check and recheck the accuracy of the divider setting by referring to and measuring off several extreme and mean ranges. It is best to check the setting by using ranges which are in even hundreds.

Once sure of the accuracy of the divider setting, place one edge of the metal coordinate square along the upper edge of the new slide and its other edge in proper position to act as a straightedge guide. With the accurately set dividers carefully score two crosshairs on the plastic. Remember, they should be centered equally from each side. (See Fig. 3.) It is a good idea to stop the scoring about $\frac{1}{2}$ " from the bottom to allow a place for crosshair identification marks.

4. Repeat this process to locate the meter crosshair. Use the 1/20,000 and the meter columns of the printed conversion tables as a reference, and the range scale of your GFT as a measure. Set off the representative range difference between the two scales on the dividers. (Example: Rn 3,500 on 1/20,000 scale = Rn 4,000 on Meters scale. Place one point of dividers on 3,500, the other point on 4,000.) Check and recheck the

setting at other ranges. As before, use the metal rapid plotter as a square and straightedge guide, this time having the guide edge on the 1/20,000 crosshair. Carefully score the meter crosshair on the plastic.

It is best to have the crosshair scored on the back or underneath side of the slide. Thus in scoring on the underneath side one must work in reverse. From the top side the three scales must appear "1/20,000—Meters—1/25,000," from left to right; in working from below, these items must temporarily appear in reverse order. The scale identification marks must also be scored in reverse.

Remove burrs of the scored crosshairs and scale identification marks with fine sandpaper and crocus cloth. You may rub paint or India ink into the crosshairs and markings, to facilitate reading.

Screw the new 3-scale conversion slide on your GFT. You now have a handy, rapid and accurate three-way scale conversion device.

Shell Case Straightener For 105-mm Howitzer

By Lt. Mike W. Folk, FA

While sitting in my executive post on one of those rare occasional periods of inactivity reading the May, 1943, FIELD ARTILLERY JOURNAL, I ran across Capt. Eugene W. DeMoore's article on a separator for semi-fixed shell. This device, I agree with the author, is very useful and is very simple in construction. Then suddenly it dawned on me that it is our own fault that some of the problems confronting us are not solved. Instead of reporting them and asking for advice we cast about for some makeshift contraption that will work for us—and thus many of these things remain to be solved by each new unit entering the field.

One of the worst things that confronts us is the extremely bent-up condition of many shell cases we receive in each lot of ammunition. Of course, one solution to this would be better packed ammunition, but having witnessed the many times that ammunition is handled before it finally reaches its destination, I can understand how and why it is in such shape when received packed in its present type of container. We most weep with joy when we behold a load of the 2-round wood-boxed type containers arriving at the battery position: this type of packed ammunition is always in good condition, and even though bulkier is much more desirable.

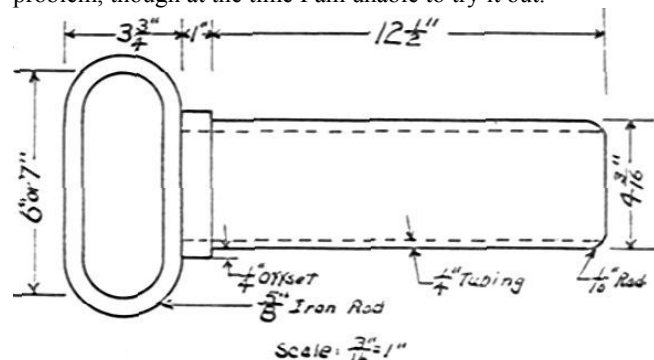
Now for the conventional 3-round clover-leaves. How can we straighten the bent cases? We have tried using a piece of wood on which we spent hours rounding up and fitting so it could be inserted in the case for us to tap out the kinks so they would at least enter the breech—only to find that in rainy weather and during night firing our block would swell up and become useless.

Then we turned to pipe, but were never able to secure any of large enough diameter to be very successful. With small pipe we were always having trouble with the primer in the base of the casing.

Finally from somewhere came the idea to try an empty projectile. From this idea was born the thing we now are using.

One projectile was disarmed and its detonating charge completely removed. The rotating band was cut off. A tee handle was welded into the nose. A 1" hole was cut into the base plate so that it would go over the primer when inserted into the case. A copper, bronze, or Babbit hammer (with at least a 4" face and weighing about 18 ounces) and a piece of board with canvas padding, are required. Now all that is needed to remove even the largest of dents (and I assure you some *are* large) is to separate the projectile from its bent case, remove all powder charges (including the base charge), place the case in an upright position on the padded board, and insert your case-straightener, tapping it entirely down to the bottom of the case. Then with the bronze hammer tap out the case entirely around the dented area, and the straightener will come right out when lifted. Replace the base charge and powder increments, and the shell may go into your stock pile, ready for use.

This, of course, is only a makeshift arrangement, but here is a sketch of what I believe would be an ideal answer to this problem, though at the time I am unable to try it out.



When inserted in the case this would be stopped from entering too far, by the offset at the top; it would permit leaving the base charge in place. Being hollow tubing, it would not affect the primer.

20-Minute Flat Top

By Capt. John J. Cahill, FA

A spider-web support does not work so well where trees are closely spaced within the battery position. Operations in the South Pacific (where growth is dense in most available gun positions) prompted a modification (Figs. 1 and 2) of the net described on page 202 of the JOURNAL for March, 1943. Our development is sturdy, compact in transit, and can be erected

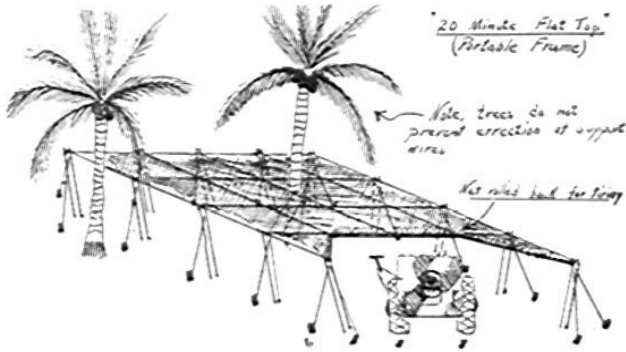


Fig 1

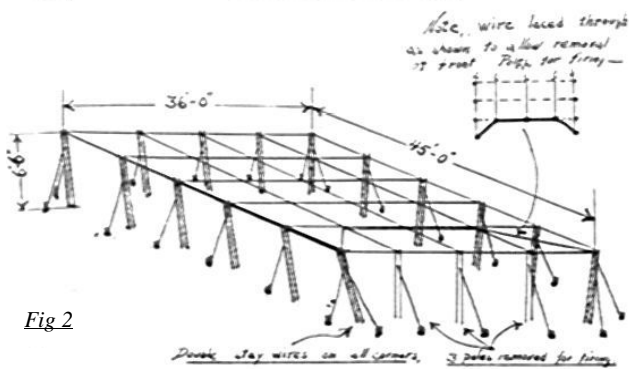


Fig 2

speedily and with as few as four men. Despite the time required to construct these frames, combat has proved their definite value.

- For a portable support for one 36x44 net you need
- 18 2"x4" poles 6'6" long
- 22 stakes 2'6" long
- 22 guy wires (10 gauge) or ropes (sash cord) 10' long
- 600' of wire (preferably 8 gauge)

Once the set is constructed it can, with reasonable care in handling, be used an indefinite number of times. The only replacements required are of guys and stakes. Stakes and guy wires are usually duplicated as time permits, in anticipation of a displacement. Local 3" saplings make excellent stakes.

We were forced to make our sets in the field, with only the few tools that a firing battery has available. These included a pair of heavy wire cutters, hack saw, hammer, pliers, and vise, not to mention carpenter's tools for shaping the 2x4s.

In constructing the folding support wires, note (Fig. 3) that loops are made every 9' in all the outside wires. These facilitate proper pole spacing, keep the poles in place (prevent their toppling sideways), and make it possible for a single guy to hold all but the corner poles.

Wire wrapped just below the top of the guy wire stakes (Fig. 4) keeps them from splitting when driven.

In making the hinged support wires, the use of two lengths of links (Figs. 3 and 4) makes it easy to distinguish lateral wires from lineal ones when they are packed up. This eliminates

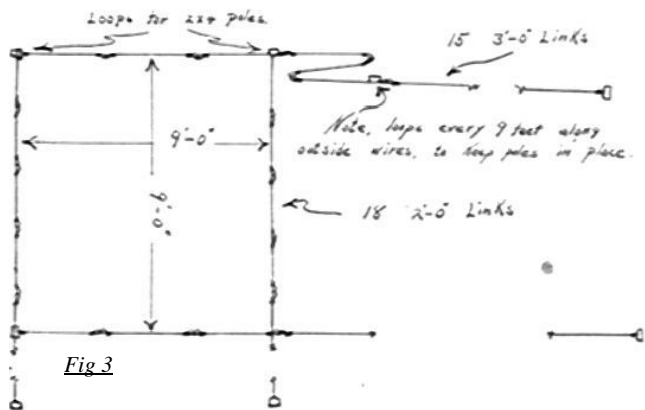


Fig 3

much confusion in erecting the frame. For a better conception of the construction of loops and hinges, see Fig. 5.

If materials are available, make a chest in which to pack the support wires for transit. One for each howitzer section will prevent any bending or kinking of the wires when in storage or transit. Poles can be bundled with their respective guy

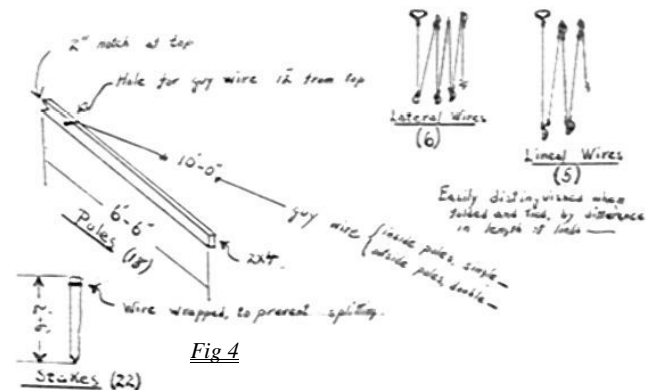


Fig 4

wires attached, making it necessary only to set the pole in place and fasten the free end of the guy to the stake driven for that purpose. Guy ropes are preferable to guy wires as they can be handled more easily when displacing, and since they will not kink they will not need such frequent renewal.

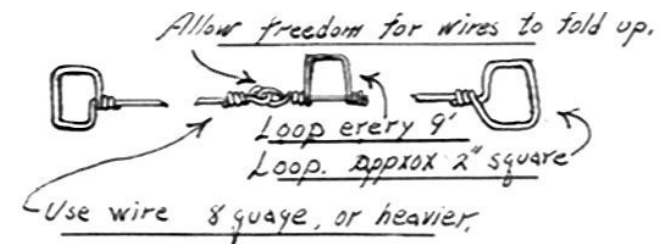


Fig 5

If the fishnet is used, it should be packed by rolling from both sides toward the middle. Thus it can be placed lineally on the center of the frame and unrolled to the sides, to prevent the necessity for dragging it across the frame. If a tree interferes, the net can be wrapped around it and the space behind the tree covered with chicken wire. The net's compactness in transit makes its general use preferable to that of chicken wire.

SURVEY PROBLEMS



In ISLAND WARFARE

By no means all tropical survey is through such open groves as this one on New Guinea. Note how breastwork in immediate foreground blends in with the terrain; such fortifications are manned by both riflemen and machine gunners.

By Capt. Jay D. Vanderpool, FA

Until recently it has been assumed that in operations in jungle-covered terrain artillery was impracticable and infantry must expect to accomplish the mission alone. The advent of island warfare with objectives relatively near landing beaches has modified this opinion. Recent actions in the South Pacific have proven that massed artillery fire is just as necessary in jungle operations as in open warfare. The Philippine Campaign, the New Guinea Campaign, and the battles on Guadalcanal and New Georgia have proven that if supply problems incident to artillery can be solved, our jungle operations follow the same pattern as those of open warfare.

American methods of massing artillery fire have proven sound in all of the operations to date in the South Pacific. The effective massing of the fire of a division or corps can not be satisfactorily accomplished without accurate survey. This fire may be called for on adjacent islands, on positive or negative slopes of prominent mountains, in deep wooded gorges, or across miles of uncharted jungle.

The artillery survey officer will probably meet more different situations in one battle or campaign in the jungle than he would in any other type of action. In a single battle he may be required to push survey to nearby islands, across high wooded or bald hills, through heavily wooded ravines, and through miles of jungle. If the target area is on an adjacent island or on a prominent hill the problem, of course, is simple: It is merely necessary to run out a base, locate a couple of points by triangulation, and then locate targets by restitution from vertical photographs. When fire is required in deep wooded gulches which are impracticable to survey, or across long stretches of flat jungle-covered ground, other means must be employed.

In Guadalcanal the battle area consisted of high bare hills and deep wooded valleys in the interior with a narrow coastal plain covered with cocoanut palms on the north. Triangulation

from the battalion areas forward to the target area through the bare hills was relatively easy, as the hilltops offered an ideal location for Trig Stations. The hills, though, were often covered with a tall grass which sometimes reached a height of six feet. This interfered with observation, but we found that it could be easily corrected by firing a few rounds of white phosphorus on the windward side before the hill was assaulted. This also had the gratifying effect of scorching ambitious Jap machine gunners who had spent several days camouflaging their positions with grass.

Deep valleys offered more of a problem, but this was met by a method that gave relatively accurate results. Two or more points were surveyed in; one of these was on the high ground and one was located as near the bottom of the valley as possible. Intermediate points were then restituted from vertical photographs to give horizontal control. Oblique photos, taken from about 1,000 feet, were used for interpolation between known points. This gave a reasonable degree of accuracy. It was found that extrapolating from known points would sometimes give results which were more accurate than the estimates of the average observer.

Units along the coastal plain had a job of traversing through the cocoanut grove. They used this control to tie in photos of the impact area. Targets were restituted from the 8"×10" photos which were available.

During this campaign division artillery and general support battalions pushed forward control to infantry front lines, leaving the direct support battalions free to concentrate on targets and check points. The degree of accuracy behind front lines was within one yard. The target area was surveyed to within ten yards. Adjacent divisions closed their traverses on one another about every 5,000 yards of advance.

In the first phase of the New Georgia Campaign a 1/20,000 lithograph of an uncontrolled mosaic was the official

map, and was used as a firing chart. This map generally gave good results, but several sectors had errors as great as 400 yards. The gun positions, which were located on small nearby islands, were tied to the main island of New Georgia by survey, to correct for map errors. Targets were located by inspection. There were sufficient terrain features identifiable on the ground and on the photomap to insure accurate fire on the area near the airfield, and inland from the beach for about 2,000 yards.

The mission assigned in the second phase of the battle was a pursuit to the north toward Bairoko Harbor. This advance was in two main columns about 3,000 yards apart. The columns were pushing the Japs, who were apparently evacuating casualties and materiel along two routes, one north to Bairoko Harbor and the other northwest to Diamond Narrows on the south end of Kula Gulf. These routes ran parallel for about 6,000 yards through rolling, jungle-covered ground to the first high ground around Mt. Tirokambia, then dropped down again for 5,000 yards through low hills and mangrove swamps. There was no observation until Mt. Tirokambia was reached and then no more until the coast line was attained at Kula Gulf.

It has been our experience that difficulty in orientation causes as much confusion in battle as failure of communication. This is not difficult to understand when one considers the winding jungle trails, hills, and swamps which must be crossed. It is an exceptional man that can crawl through a jungle swamp under machine gun fire and be able to estimate accurately how far he has traveled. There are few terrain features that can be recognized on a photograph of level, jungle-covered ground unless there happens to be an old bomb crater or artillery scar. The dense jungle trees form a carpet covering all terrain features.

We met this problem by surveying in the artillery forward observer with the leading infantry company. One survey party followed each main column, tying the front line companies in by traverse from the battalion area. Then, as we always knew where the forward observer was, it was a simple matter to drop a salvo 200 yards in front of the leading company when fire was needed. By this means we were able to "bring in" the fire of one or more battalions for an intense and accurate concentration. The automatic weapons and mortars used by the Japanese rear guard could be pinned as soon as located, and taken or driven back.

The party which we used traversing from Munda Airfield toward Bairoko Harbor was as follows:

- 1 Survey Officer Chief of Party.
- 1 Instrument Sgt. Instrument Operator (used 20" Gurley transit).
(Staff Sgt.)
- 1 Instrument Sgt. Computer. (All work was computed as party
(Tech.) advanced so as to be able to give location of
last station at any time. This computation was
checked by Survey Officer during stops and at
night.)
- 1 Private Rodman. (Stadia traverse was used by this
battalion. It gave results equal to those of a

- battalion using chain.)
- 1 Private Rear Flagman.
- 2 Privates Scouts. (Kept 40-50 yards ahead of party and
performed normal duties of scout on the point
of a patrol.)
- 1 Private Scout (rear guard).
- 3 Privates Axemen. (Carry machete and rifle. Cleared line-
of-sight and acted as local security.)
- 1 Tech. 5th Grade Chauffeur. (Drove jeep containing equipment,
and advanced as rapidly as bull-dozer cleared
trail.)

1 Officer and 11 Enlisted men*

This survey party is a complete unit which can follow on the tail of the small-arms fire at all times. This distance is normally about 300 yards. When the leading elements stopped, survey could be pushed forward to them without delay. If the fire fight is too hot to permit taking a stadia rod forward to each forward observer on the line, control accurate to $\frac{1}{2} c$ can be obtained by sending a man forward to contact each forward observer. He then paces a traverse back one or two hundred yards to the last accurately located station. An M-2 compass properly declinated can be used for directional control of the paced traverse.

The party maintains close contact with the battalion wire section which is laying wire to the artillery forward switchboard at the infantry battalion command post. By doing this they could be called by the battalion commander, S-3, or forward observer at any time that information was desired.

There has been some sniper trouble, of course, from riflemen who have filtered through advancing infantry. They have not seriously hampered operations. Most snipers kept about 100 yards from the trail and fired at sounds. As we are learning to keep noise to a minimum, the sounds created by water- and ration-carrying parties drew most of the fire.

This type of survey was not only a benefit to the artillery but was also valuable to the division commander and to the infantry commanders. Normally the major causes for delay in "bringing in" artillery is due to the vagueness of the situation of adjacent units. Artillery forward observers can control fire to their immediate front by sound, even in heavy jungle, but fear of firing on adjacent units often prevents rapid adjustments for the supported infantry. This can be corrected if the direct support battalions keep survey to the leading elements and this information is relayed laterally. I have seen an advance bog down for several days due to a lack of knowledge of the locations of adjacent units. Close support artillery fire was restricted for that time. Strong points taken during this period were obtained at a high cost. This could have been corrected in a half a day had survey been carried forward.

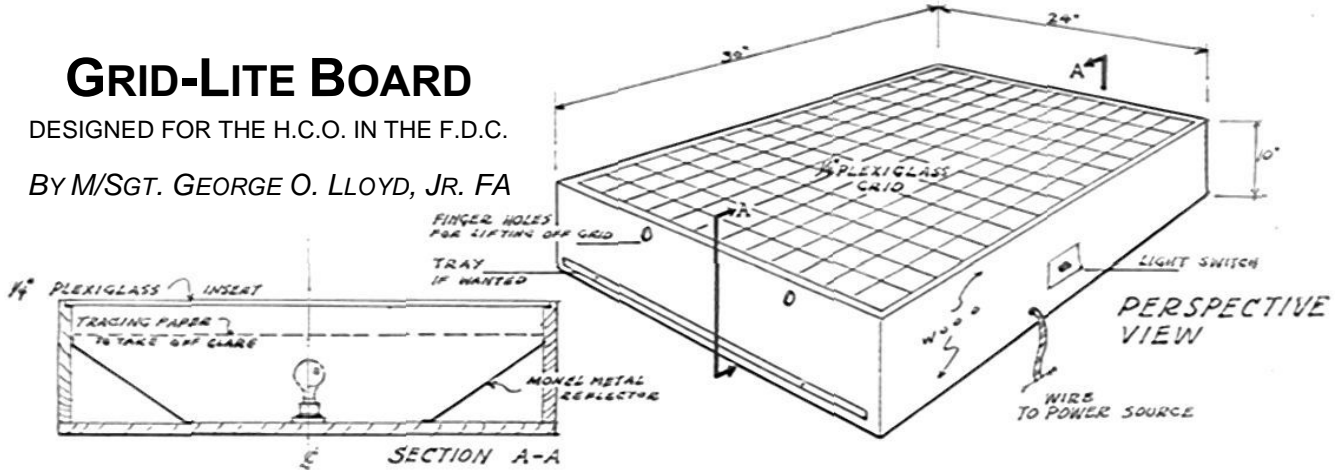
*Note: This section is in excess of T/O. Additional men were drawn from the antitank section, which had no AT mission.

Your address—have we your latest *complete* address, including serial number and full unit designation or postal district number?

GRID-LITE BOARD

DESIGNED FOR THE H.C.O. IN THE F.D.C.

BY M/SGT. GEORGE O. LLOYD, JR. FA



This Grid-Lite plotting board is designed to eliminate the faults found to be present in the GI paper grid sheets during the Guadalcanal campaign.

The HCO has two major difficulties to overcome. First, in damp weather his paper grid sheets have a tendency to expand and buckle. This buckling makes it difficult for him to plot coordinates and measure ranges correctly, and also makes it hard to swing the range-deflection fan across the paper. This dampness expands the grids to such an extent that in addition to numerous other Ks you must apply one for the grid sheet. Secondly, lighting facilities under combat conditions are often hazardous and inadequate. The plotting of important positions and concentrations requires accuracy and skill, and must be unusually precise when they are near our front lines. When doing this plotting and reading, the HCO must rely upon the lighting facilities at hand. Depending on the situation, he will probably use gas light, kerosene lamps, flashlights, or candles. Our HCO encountered some difficulties using these aids.

Our attempts to find a solution for the problems were abetted by recognition of the adaptability and permanency of "Plexiglass," which is used widely in the Air Force. A perfect 1/20,000 grid was scribed in the plastic by means of a divider point; the grooves were filled with India drawing ink. A frosted surface (needed to permit marking and plotting on the glass with pencil, ink, or crayon) was achieved by sandpapering both sides of the glass until these surfaces had a milky finish. The next step was to experiment with all types of marking. We found that all markings would stay on the glass as long as desired, and could be removed with an eraser or damp cloth when a new chart is desired or the old one becomes obsolete.

For a daytime setup it is simple to take the unbreakable "plexiglass" out of its cabinet and place it on a plane table

just as would be done with an ordinary grid sheet. When preparing for the night setup, return the glass to its permanent carrying box, switch on the lights, and your glass grid is evenly illuminated by indirect lighting.

Power for the lights may be obtained through an extension attached to a 4x4 1/2-ton truck, by a generator, or from rechargeable storage batteries. Lights need only be turned on when the firing chart is in use in order to conserve power.

A standard pinpoint may be used as the pivot when reading ranges and deflections for fire missions. The glass "gives" just enough for the pin to get a grip on the plotted battery position, without making the large hole that often develops when using a paper grid sheet. Transparent scotch tape can be placed over battery positions to save the glass from any marking of permanent effect. Prolonged use of the glass may necessitate resanding its surface, but this will not impair its efficiency.

Another feature of the Grid-Lite box is that it is adaptable for tracing air photos, maps, and overlays, as it supplies the transparency needed for quick and accurate work.

This idea for a permanent grid sheet was born on a tropical island. Thanks to the cooperation of the Navy and our own Pvt. Koblenzer the vital supplies were provided. What was done here could far more easily be done with the materials available at home.



"Before"



"After"

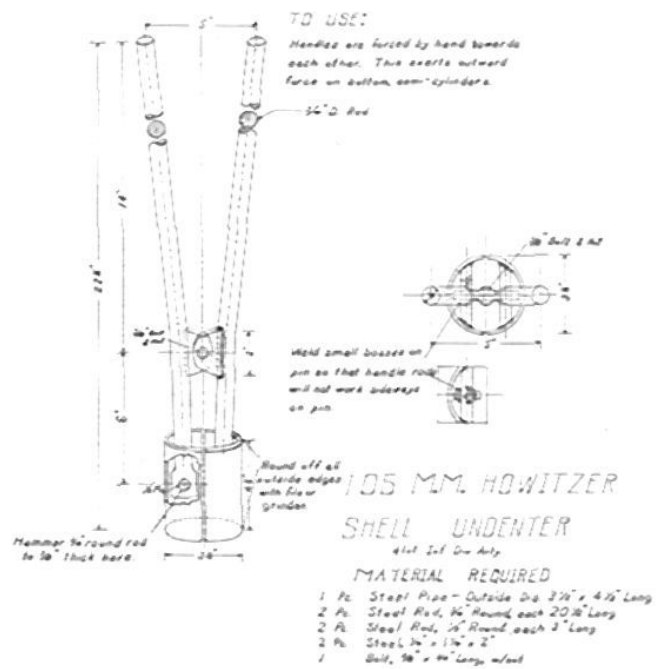
"UNDENTER," SHELL CASE, 105-mm HOWITZER

By Capt. R. M. Brewster, FA

To overcome the evil of denter cases, a shell case "undenter" was made under supervision of Lt. Carnegie, a battalion ammunition officer. In 9 months the basic design has not been changed, because it really removed dents so that otherwise useless ammunition could be fired. These "cartridge case undenters" have been used under battle conditions, and are the answer to a cannoneer's prayer.

To construct, they require only a small amount of material and a welding outfit, often available in many battalions and always available at ordnance shops.

To use these "undenters," remove the projectile from the shell case, and also enough of the powder bags to expose the inner surface of the dent. Then place the semi-cylindrical ends of the "undenter" inside the cartridge case and apply force at its other end. As the outward force is applied to the inside of the shell case, tap the outside perimeter of the dent



with a wooden mallet as if removing a dent from a fender. That's all there is to it!

AT POINT-BLANK RANGE

By Col. A. Vasiliev

Experience has shown that there are no cut and dried methods for shelling at close range. Such fire must in every case be adapted to the situation at hand. It may be maintained by a single gun upon a given point, with several guns (45- or 76-mm) under the cover of trench mortar fire, or with several batteries augmented by trench mortars from sectors held by two or three divisions.

In one division point-blank fire was organized as follows. At first the entire artillery force of the division laid down a combined barrage. Later it subordinated its fire to the requirements of individual infantry regiments. Firing was usually heaviest in the morning and evening, though often there was heavy shelling during the day. Every large-scale barrage was preceded by a thoroughgoing reconnaissance, carried out by scouts who also noted convenient approaches and possible gun positions; at night AT guns were brought up into these. While gun platforms were being prepared at the new positions, trenches were simultaneously being dug for the crews. When guns can not be removed readily, it is especially essential that shelters be provided to protect them from the enemy's retaliating fire.

Nearly all 45- and 76-mm guns of the division participated in this operation, during which the ordnance spoke up 20 times and destroyed 20 enemy blockhouses, 3 antitank guns, 15 machine gun nests, a tank and a trench mortar, and caused

many casualties. These barrages proved highly effective. The enemy's fire intensity declined to a marked degree. Even those Russian guns which had been firing from exposed positions failed to draw the enemy's fire until some 30 minutes had passed—and that was after they had been removed to their shelters. As a result, the division suffered no losses of men or guns.

Point-blank fire has considerable advantages. It is highly effective, and requires far less time for preparing data and making the adjustment. Such fire can be brought to bear very suddenly. Operations at close range facilitate the shifting of fires from one target to another, and eliminate the need for complex calculations. Shelling at close range also requires less ammunition than does fire conducted from defiladed positions.

Needless to say, fire from open positions requires certain preparations. To preserve a gun thus employed, several firing positions must be established. Transfer of the piece from one position to another must be screened by natural or artificial means. Under no circumstances must fire be delivered from a single position for more than 10 to 15 minutes at a time. After that the gun must be quickly removed to another position if concealed routes are available, or else be withdrawn to cover. Experience has shown that if no concealed routes are available the gun must be kept under cover from 30 to 40 minutes, during which time smoke screens may be laid by other guns to conceal the piece as it is moved to its new firing position later on.

By radio from Moscow, direct to the *Journal*.

ROUTES INTO EUROPE

A Study in Terrain

PART VII—NORTH FRANCE

By Col. Conrad H. Lanza

GENERAL CHARACTERISTICS

Commencing at the mouth of the Loire River, the coast changes from the uniformly straight, low, and sandy beach found along the entire west coast, to uneven and varied forms. Rocks first appear at Pte. de St. Gildas, just south of the Loire's mouth. Thence proceeding around the entire coast of Brittany, the coast is rugged, broken, and wild, with numerous bays and ports. This continues until at the northeast end of Brittany the Bay of Mt. St. Michel has low and sandy shores.

Next comes the Cotentin peninsula, on which Cherbourg is located. Its west side is bordered by cliffs, but the east side is low. The coast then remains low as far as the mouth of the Seine River.

East of the Seine, cliffs border the shore almost to the mouth of the Somme River. From here to near Boulogne the coast is again low, then cliffs resume again to past Calais. Then there is low country, part sand and part marsh, to the Belgian border.

Cliffs on the French coast are seldom vertical. They may average about 200 feet in height, are usually soil covered, and can be readily scaled by foot troops. They are an obstacle to vehicles. Stream lines through the cliffs are not infrequent. Through some of these roads and railroads reach the ports and shore; through others are paths which could be made into practicable routes for military vehicles.

All of north France is rolling country, thickly cultivated and studded with towns and cities. With two exceptions no part exceeds 650 feet in elevation. These are the low mountains in Brittany and another low range in south Normandy, which will be mentioned again later.

Lines of communication are excellent, there being a dense net of both hard surfaced roads and railroads. The latter may have been injured by the Allied bombing campaigns. In any case it appears that the enemy is depending on roads for rapid movements of troops. This also renders him independent of possible French sabotage on railroads. The probability of this is increased by reason of incessant Allied propaganda, urging the French citizens to prepare such sabotage, to be placed into execution on a day to be designated by broadcast. Presumably this will coincide with invasion day.

The population of north France is dense, and is believed to be nearly unanimously in favor of the Allies and of Russia. Consequently Allied troops can expect assistance from the local people.

EFFECT OF THE SEASON ON INVASIONS

The good season extends from the end of April to the middle of September. Then there is little rain, skies are clear. Days may be warm but nights are almost always cool. The sea is likely to be smooth—or comparatively so, for in the English

Channel the water is likely to be rough on even the best of days.

During this period an invasion is favored by the probability that landings over open beaches will not be interfered with by bad weather. The Air Corps can carry out all its normal duties, including reconnaissance and battle support. Visibility is good to excellent, and favors artillery fire. Ground is dry enough that driving vehicles across country is generally practicable. In the past, campaigns in north France have habitually been fought during the good season.

From the September equinox on, the weather changes and a rainy period sets in. It is a drizzle and mist, but continues off and on for days at a time. Sunshine is so rare that the ground, after it becomes wet, stays wet and is covered with slime and mud. This in turn affects road transportation and has been a prime cause for the cessation of military operations in winter. In these days, when many military vehicles are equipped with tracks or half-tracks, it should be possible to drive through the mud across country, with only minor restrictions where steep slopes exist.

Clouds are low in winter. These with the mist and rain interfere with air operations, making it impracticable to bomb from high altitudes with reasonable precision. They interfere with air and ground observation, so that artillery must largely guess where the targets are.

The continuous wet climate often affects the health of the troops, and may lead to substantial increases in the number of men on sick report.

During this period storms at sea are not infrequent, and when these occur landings on open beaches may become impracticable for several consecutive days. The meteorological service can be counted upon to give due warning of storms, and the initial landing should be able to count upon several days for disembarking, but it is not possible to predict storms so far ahead as to be able to assure an uninterrupted series of landings over a week. If a storm should arise after the invasion forces are ashore it might materially affect the situation if reinforcements, ammunition, and supplies can not be landed.

This type of weather usually lasts until the March equinox, when it begins to slowly disappear. With more sunshine the ground dries out, and generally by the end of April the good weather season is once more established.

THE ENEMY

North France has been in enemy possession for well over three years. As he has been expecting invasion, he has spent time and labor to construct an intricate system of obstacles, demolitions, and fortifications. The usual depth of the coast

defense zone is about 10 miles, but this is increased in places to as much as 30 miles. In this zone the civilian population not immediately needed for essential services, has been evacuated.

The enemy does not maintain sufficient forces in any sector of the coast to repel a major invasion. The mission of the defensive zone is therefore to delay invaders and prevent them from arriving deep inland before troops can be concentrated. These would then take advantage of the defenses prepared in advance, to counterattack with a view to driving the invaders back into the sea.

At sea, in advance of the defensive zone, the enemy maintains naval patrols. They are constantly looking for invasion parties, large or small. By rocket or radio they signal the shore of approaching vessels. Unless the weather prevents there is also an air patrol which reconnoiters as far out as to include the British embarkation ports.

From air photographs, constantly kept up to date, the enemy has ascertained in what ports invasion barges and other craft are located. From their numbers a fair idea of the strength of the forces intended to sail is had. The British have embarkation camps and cantonments close to ports. The enemy used to be able to tell, by observing whether the camps were filled or not, whether an overseas expedition was imminent. Now it is customary to maintain complete expeditionary forces at or near ports of embarkation, always ready to sail away. The enemy can no longer tell when an expedition is about to start as the prepared forces are always 100% ready. For the expedition against Dieppe last year the embarkation was made after dark, so the enemy did not know of it until the force was approaching its objective.

As the enemy has only small forces on the coast, towns and other important points are garrisoned as local strong points. In between patrols are maintained, backed by supports. These watch the coast and attempt to intercept intruders—small British patrols which occasionally come over, and secret Allied agents passing back and forth.

Cities and towns on the coast have been converted into centers of resistance, with a main mission of preventing the

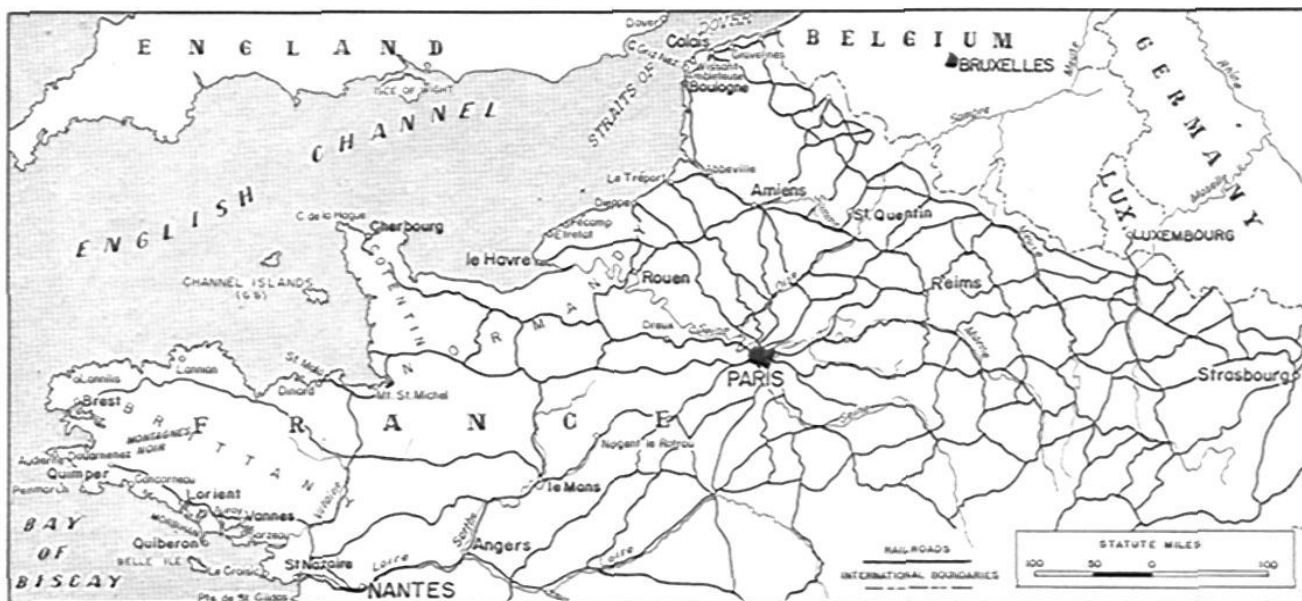
invaders from utilizing the facilities of their ports until the German main force has had time to concentrate and is in a position to undertake offensive action. As no two towns are alike, each location is a separate problem. In some cases the sea front is defended by strengthening buildings with steel or concrete. In others, the main line of resistance is back of the coast, protected by buildings between it and the sea. These buildings may be completely demolished and left in a state of ruins. They may be walled together and filled with mines to be exploded when the invaders enter them. They may be separated from the main line of resistance by a narrow space, such as a street, or a wide open space may have been cleared to afford a good field of fire. In the MLR openings in buildings are bricked up, and streets and passageways solidly walled across. The idea is to prevent any possibility of invasion tanks finding a way through a long and continuous front. As the best beaches in north France are bordered by towns, this general type of strong point is common.

A large amount of artillery has been employed by the enemy to cover the shore and his own strong points. These are guns captured in previous campaigns, and are not part of tactical field units. They have minimum personnel. Where cliffs have beaches at their foot, mortars are in extensive use to deliver curved fire against prospective invasion parties.

This artillery is supplemented by machine gun posts sited to cover beaches and the exits therefrom. These may be garrisoned by but two men, provided with ammunition and food. They are well protected, and not easy to locate.

Wire is employed extensively. Solid belts are usually some distance inland, and have been erected with a view to facilitating the method of employment of the troops destined to attack the invaders. Mine fields are large and numerous. They cover beaches and their approaches in the first line, and intended lines of resistance in the interior.

The enemy has a complete system of battery positions, OPs, CPs, etc., in all sectors. The plan is that after the invasion forces have committed themselves to a landing and their approximate strength is known, troops to counterattack will



be brought up with maximum speed. By using the prepared defenses it is expected that they will be able to launch their offensive under favorable circumstances within a short period.

Main enemy forces are well in rear. Theoretically they are supposed to be far enough away and sufficiently scattered to avoid serious losses from any preliminary artillery or air preparation conducted by the invaders. These forces are to assemble in previously designated areas, by use of motor transportation. The enemy's main air forces are far to the rear, probably in Germany. Arrangements have been made to concentrate coast air forces in any sector upon short notice.

The only example thus far as to what the enemy can do in the way of quick assembly of his forces against an invasion, is the expedition against Dieppe over a year ago. Dieppe was one of those strong points guarding a very good resort beach. The invaders captured the greater part of the front line of defenses, but the interior line held and the invaders never got far inland. To the right and left of Dieppe the coast is bordered by cliffs. These were lightly held by the Germans, and with one exception landings made progress. The foot troops scaled the heights and advanced inland from one-half to over two miles. Then they ran into wire covered by artillery and machine gun fire. Having no tanks nor artillery on top of the high ground, the invaders found it impossible to go further. Tanks had been landed, but the sand on the beach was too much for them; according to present records, none of the tanks were able to cross the beach and none succeeded in scaling the cliffs.

In this expedition the enemy received his first information of the coming raid from the off-shore navy patrol, which signaled its front about one hour before the landing. OPs located the expedition not much before the escorting vessels opened fire. The zone of fire being clearly observed, troops from areas to the right and left could be released at an early hour.

The enemy had his forces alerted before the expedition arrived. It is not known when orders were issued for assembling the troops for counterattack. German air reinforcements arrived about 1100 hrs. They appear to have been the local coast guard forces, assembled from sectors as far away as Belgium. When they arrived it so happened that although they were inferior to the air force of the invaders, the latter had largely returned to England to draw gasoline and ammunition, which were then nearly expended. This left the enemy with local air superiority for a short time during which he caused considerable trouble.

German ground troops are reported as having been in their prepared positions, ready to counterattack by 1500 hrs. At this hour, however, the expedition had already withdrawn so no counterattack was necessary. There is no information yet as to how large a force the Germans had gotten together for their proposed offensive.

At date of writing (Sept.) the enemy is believed to have in north France not over 35 divisions, and probably not over 30. At least 5 divisions will be needed to guard lines of communication and the zone of the interior. Not all forces can be withdrawn from other sectors. The maximum probable force for any one invasion area would be 20 divisions, and of these not over 15 would be initially engaged.

If the enemy is satisfied that the invasion is in such strength as to make it improbable that another could arrive elsewhere,

he could assemble 15 divisions at or near the center of the north shore by the end of the 2nd day. If the invasion is near the right flank, in the Boulogne-Calais area, the same force could be ready to attack by the end of the third day. To assemble 15 to 20 divisions in Brittany over the existing road net and under probable bombing, might require 4 to 5 days.

To make headway against this enemy force an invasion would need to land at least 6 divisions a day for three days to secure equality, and thereafter to obtain superiority. A faster landing or one with larger forces would have greater chances of success. It is not necessary that the invasion be limited to a single sector. It might well land in adjacent sectors, or on opposite sides of the peninsulas of Brittany or Cotentin.

The Germans have foreseen that the invaders might land armored troops at first, and attempt to have these dash inland. To provide against this hazard forward defensive zones have the usual antitank obstacles and weapons. But back of these are extensive and continuous lines. The main antitank line appears to start at the Loire River near Angers, thence runs along the Sarthe River, via Le Mans, Nogent-le-Rotrou, Dreux, and the Oise valley into Belgium. Other lines are along the Meuse and Moselle Rivers. Antitank lines follow water barriers as far as possible. Points of crossing, including bridges and fords, are protected by strong points with all-around fire and wire. Intervals are covered by large mine fields which are expected to delay invaders from reaching a stream line and constructing a bridge until the defenders can arrive in strength.

Germany's present tendency is to increase the armored divisions at the expense of infantry divisions. Were there unlimited supplies of materiel, gasoline, and oil, which is not the case in Germany, the majority of divisions would probably be armored or motorized. The motorized divisions have armored trucks to permit an advance under fire. The number of armored divisions now in north France is not known. Reports indicate that there are at least 5, but there may be a larger number—and any number present at this date may change by the time an invasion occurs.

In case the 20 enemy divisions immediately available in north France are insufficient to stem an invasion the enemy would have to draw on adjacent theaters of operation or on his general reserve. The adjacent sector of south France was reported by German sources as having normally 15 divisions. It is doubtful whether many of these could be spared for north France.

No one knows the strength of the enemy's general reserve. In June, 1943, Germany stated that they had such a reserve located in south Germany, but its strength was naturally not given. As south Germany would be a proper location for the enemy's general reserve this report may be correct. The number of divisions in the reserve presumably changes according to the general situation, and it is impossible to foretell whether there would be any divisions available at some future date when an invasion of north France might occur.

BRITTANY

Brittany is a peninsula about 135 miles long and 75 to 80 miles wide. Its shape and location, and its excellent marine base of Brest at its outer end, naturally suggest it as a probable good invasion area. Besides Brest, Brittany has other

good harbors; it has excellent airfields and ample space and facilities for depots and for assembling troops.

The entire coast of Brittany is rocky, very indented, rugged and wild. Good beaches are interspersed between impassable rocks. Some of the beaches are well known resorts, and excellent for landings. Nearly all have rocks and reefs off shore. In good weather and by day these are easily avoided, and they would not interfere with a landing. The contrary is the case at night or in bad weather.

At the mouth of the Loire is the fine port of St. Nazaire. Unless invasion operations include the south side of the Loire, enemy artillery on that bank of the river will make this port unusable. However, in case of an invasion in this area the city should be seized at an early date in order to rest the right flank of the invaders thereon. A direct landing at the city could probably not be made; it would be necessary to attack it from the rear, from landings made to the west.

Forty miles west of St. Nazaire is Quiberon Bay. This has excellent anchorages, and could eventually be made into a good base. The bay can be best attacked by two landings—one on the south side of the peninsula of Rhuis (in the area south of Sarzeau and as far east as Le Croisic), and the other west of the peninsula of Quiberon (which forms the west boundary of Quiberon Bay).

Good weather and good pilots are essential for a landing on Rhuis peninsula, whose shore is divided between beaches, rocks, and cliffs, while off-shore are numerous reefs and submerged rocks. The shore west of Quiberon peninsula contains extensive beaches, but here too rocks and reefs interfere with sea approaches. It would be possible to support these landings with any desired amount of naval strength.

Quiberon Bay has an inner bay, known as the Morbihan. It is 11 miles long and 6 miles wide, entered by a channel only half a mile across. The Morbihan is studded with islets and at its head has several towns, including Auray (15,000 people) and Vannes (25,000). The Morbihan can not be entered by large ships, but it has good facilities for debarking from barges and small craft; its surrounding towns will afford good shelter.

Beaches available would enable 5 divisions to land simultaneously east of Quiberon Bay and 4 others west thereof. Assuming the invasion was a surprise to the enemy, 9 divisions is a greater force than he is likely to have in this vicinity initially. If no other invasion is made or threatened at the same time, the enemy would hardly concentrate his entire force so far to one flank unless he is assured of replacements from his general reserve. It might be possible to establish a good sized beachhead in this area before the enemy could do much about it.

Less than 20 miles westward from Quiberon Bay is the city of Lorient (50,000 people). This is a small but excellent port, and is used by the enemy as a major submarine base. Landings can be made east of Lorient, as already discussed for west of Quiberon Bay. They may be also made west of Lorient to include Concarneau. This gives a 40-mile front for an invasion landing, and against probable enemy resistance and counterattacks would require not less than 6 divisions, which if Quiberon Bay is attacked at the same time might be reduced to 4 divisions.

The west side of Brittany, which is the outer end of the peninsula, covers a front of over 50 miles. It includes the large

and excellent port of Brest, which is suitable for a major base. The entrance to Brest harbor is protected by permanent forts and mine fields. A direct sea attack might not be successful. The coast in the immediate vicinity is unusually rocky and difficult, and not promising for an invasion.

South of Brest is the Bay of Douarnenez, 9 miles wide. As it is quite exposed to west winds landings are dependent on the right kind of weather. There are good beaches in the bay and others on the outer side of the peninsula which forms the south boundary of the bay, between Audierne and Penmarc'h (pronounced "Penmar"). Landings may be good at the latter place when the reverse is the case inside the bay, and vice versa.

The north side of the Bay of Douarnenez is heavily fortified as part of the defenses of Brest. An advance based on landings on the south side of the bay, made from either the inside or outside faces of the peninsula, must pass the line Douarnenez—Quimper. Quimper, well known as the "city of fables and gables," has a small port. As the line from there to Douarnenez is only 15 miles long, unless it can be seized quickly it may be difficult to take. If this line should be passed, just beyond are the Montagnes Noires, or Black Mountains. These are not over 1,000 feet high, but are quite rough and afford good defensive positions.

An attack on Brest from the direction of Douarnenez and Quimper is not so promising as one based upon a landing at Lorient or Quiberon Bay.

North of Brest the coast stretches for 50 miles between Lannilis ("Lannids" on some maps) and Lannion. This section is noted for the large number of rocks of all sizes offshore, many of which have fantastic shapes. They form a serious obstacle to landings. It is practicable to make a landing in this area, but it would have a better chance of success as a secondary attack under a major one on the south side of Brittany. This section of the coast lies mostly within the defensive zone of Brest, and strong opposition should be expected.

From Lannion the coast stretches eastward for 90 miles to the Bay of Mt. St. Michel. This is alternately rocks, cliffs, and beaches. Some of the beaches are excellent, especially those near Dinard and in the Bay itself. There are several small ports suitable for debarking from barges and small craft.

To the north of this part of the coast are the Channel Islands, which are occupied by the enemy. From this vantage point the enemy is in a position to observe approaching expeditionary forces several hours before they can arrive on the coast, and so he has that much more time to assemble his defensive forces.

At low tide the Bay of Mt. St. Michel has in places considerable expanses of exposed mud, hence a landing in this bay may be restricted to certain hours. On other beaches to the west landings are generally possible at any stage of the tide.

An invasion which centered on the twin ports of Dinard and St. Malo over a front of 25 miles, if made in conjunction with a landing near Quiberon Bay, would be in a good position to initiate operations to pinch off the entire peninsula of Brittany and establish a line along the Vilaine River (or vicinity) facing eastward. At least 8 divisions would be required to supplement 8 at Quiberon Bay. Enemy troops in rear of the line, including those assigned to the fortress of

Brest, could be attacked later, preferably by minor invasions landing to the west of the main ones. In all about 25 divisions would be required.

NORMANDY

At the west end of Normandy the Cotentin peninsula again suggests a desirable invasion area. As in Brittany, at the outer end of the peninsula is an excellent port—in every way suitable as a major base.

The west side of the peninsula has extensive and good beaches, nearly all at the foot of cliffs. These are not an important hindrance for foot troops, but they are a decided obstacle to vehicles. In places rocks abound off this coast. As for north Brittany, a sea approach to this area must pass the enemy-held Channel Islands. It must therefore be presumed that an invasion would be known to the enemy four or more hours before it reached the shore.

The east side of the Cotentin peninsula is low, favorable for landings. The north end is precipitous, and it and part of the east coast are included in extensive fortified areas covering Cherbourg. In spite of numerous bombings this city is regularly used by enemy sea traffic. The enemy could assemble his troops opposite the Cotentin peninsula in less time than in Brittany. Landing areas, limited to south of Cherbourg, would have a front of no more than 20 miles. Within this space the force that can be landed is not large enough to be probably sufficient to overcome enemy resistance.

Should Brittany be captured first, there would be an excellent chance of advancing westward and automatically cutting off the Cotentin peninsula. From an 80-mile base in Brittany 20 to 25 divisions could be profitably used in an offensive, but from the Cotentin peninsula not over a third of this number could be used. This would be too small a force to promise success.

From the Cotentin peninsula to the mouth of the Seine is 60 miles. This coast is divided between beaches and rocks. The beaches include the finest resort beaches in France. Back of the coast there are no natural terrain obstacles. An invasion force of about 20 divisions on this front would suffice to meet any available force of the enemy, unless he drew upon his reserves. This would require time, during which additional Allied troops could be brought over. An advance from this area would naturally start for Paris, keeping the Seine River on the left flank. The advance could at any time be diverted to meet the enemy's army should it elect to take a position to one side of Paris. As this part of the French coast is less than 100 miles from England, an invasion of this area is one of the more promising ones.

East of the mouth of the Seine, as far as the Somme River 75 miles away, the coast is bordered by high cliffs. In places these are broken down, and they are often covered with trees. Roads to beaches are almost defiles, lending themselves to blocks.



Mont St. Michel

One excellent port (Le Havre) and two small ones (Fécamp and Dieppe) are located in this area. Le Havre, one of the great ports of France, is in every way suitable for a major base. The harbor has been frequently bombed by Allied planes but continues to function for enemy shipping. While certainly damaged, it is still usable, and additional facilities not now available can be repaired and put into use.

A direct attack on Le Havre is possible. The harbor is on the south side of the city, within the mouth of the Seine. It has extensive

quays, warehouses, and other facilities. The west side of the city fronts on the English Channel. This section of the coast extends nearly north and south, and for several miles has excellent beaches with good access to roads and streets. This city is one of those which have been specially prepared for defense. Just north of the city the cliffs come close to the sea, and access to the beaches at their foot is restricted.

Fécamp and Dieppe are small ports. Each is at the mouth of a minor valley, having roads and a railroad affording access from the shore to the high ground above the cliffs. Both have good beaches suitable for landings. The enemy has garrisons and defenses at both places. Excellent beaches on this stretch of coast are to be found at Etretat and at Le Tréport. At the latter place the beach is shingly and suitable for driving motor vehicles over it. Other beaches are sand. In general, good beaches are common on this sector. Just before the Somme is reached the cliffs recede from the sea and the mouth of that river has sand on both sides.

An invasion between the Seine and the Somme Rivers presents certain strong advantages. The distance from England averages not over 50 miles, making it possible to furnish good overhead fighter support from English air fields. Good ports are available if captured. An advance inland would have two considerable rivers to cover both flanks. From 12 to 20 divisions, as desired, can be simultaneously landed within the available space.

If the invasion forces succeed in advancing inland as far as the Oise valley, they would then be occupying a beachhead nearly square and about 80 miles long on a side. Within the square would be ports, numerous airfields, and space for all military requirements. This position affords wide latitude for thereafter originating strategic movements in any one or more of three major directions.

On account of the opportunities this part of north France offers to an invader, the enemy has given special attention to it. Defenses are unusually complete, garrisons large. Reserves are close, and the network of roads enables concentrations to be made within a minimum of time. It is probable

that the enemy could have 10 divisions in this area at the end of the first day, and thereafter 5 additional divisions on each of the two succeeding days. An invasion by less than 20 divisions would not be promising.

Thirty miles away and on opposite ends of a line parallel to the coast, are the important cities of Rouen and Amiens, controlling roads and railroads crossing the Seine and Somme Rivers, respectively. A ridge line lies near that joining the two cities, and affords some opportunity for a defensive position. Present indications are that the enemy would not initially go so far back. Rather, he would make his first defense close to the sea and counterattack therefrom at as early a date as practicable.

NORTHEAST FRANCE

The coast line from the Somme to Boulogne, 35 miles distant, is low and sandy and bordered by sand dunes. The mouth of the Somme is covered by sand bars, and at certain low tides may be crossed on foot.

Boulogne-sur-Mer is an excellent small port. It is commanded from the cliffs, which run through the town. South of Boulogne the entire shore to the Somme is a succession of beaches, all sandy. With the dunes back of them, they would be difficult for motor vehicles to cross. The dunes afford fair defensive positions, and the enemy has strung much wire and laid many mines among them.

North from Boulogne the coast is low. This is now Flanders, and the inhabitants speak Flemish. Twenty-five miles away is Calais, another small but excellent port. The cliffs touch the shore once more at Cap Griz Nez, 165 feet high, which is the place in France nearest to England—16½ miles. On each side of Cap Griz Nez is a good beach, suitable for landing—Ambleteuse on the south and Wissant (Wimereux on some maps) on the north.

From Calais to Dunkirk—a 30-mile stretch—the coast is low and sandy. The adjacent terrain is much cut up with canals, and the country can be partly submerged as some of it is slightly below the level of the sea. About half way between the two towns is the small port of Gravelines, which has very good beaches in the vicinity.

Dunkerque (or Dunkirk) is a first class port, in normal times being commercially the fourth most important in France. It has excellent and extensive beaches, made famous by the 1940 embarkation of the British Army. Canals extend inland from Dunkerque, and run throughout the adjacent country. These form only minor military obstacles, but must be taken into consideration in movements of armored troops and vehicles. There is no reliable information as to the enemy's special dispositions in this neighborhood, but it seems probable that the canals have been developed into antitank obstacles. Beaches, sand dunes, and canals extend from Dunkerque to the Belgian boundary, 8 miles away. Inundations are possible in places.

A landing in northeast France is practicable. The advantage is the short sea passage from England, which is balanced by the fact that the sea in this area is habitually rough even in good weather. The best landing area is south of Boulogne, as the terrain inland from this section of the coast offers no special difficulties. Landings in the north sector are liable to find the sand and canals affording the enemy opportunities for delaying actions while he assembles his reserves. A landing between Boulogne and the Belgian border would be more advantageous

as a secondary operation to a main one north of the Somme.

The maximum number of divisions which could be used in a first wave to invade this section of France would be about 20, evenly divided into two forces by the city of Boulogne. On the whole such an invasion is not so promising as one made south of the Somme.

From the enemy's point of view, northeast France would be easier to defend than sectors further west. It is nearer his source of supplies and his home country. A large part of the north half of the area starting 20 miles back of the coast, is filled with coal mines and industrial cities which afford good defensive positions. If an invasion does occur here, the enemy may assemble his main forces in flank positions either in Belgium or near Amiens, or might combine one or both of these possibilities with a defense line parallel to the coast. His lines of communication by road would enable him to support armies in all three positions. He would be so close to Germany that he could largely ignore the railroad system, should the Allies's propaganda efforts succeed in sabotaging railroad operation when invasion occurs.

COMMENTS

On last August 31st at Quebec, Mr. Winston Churchill, Prime Minister of Great Britain, stated:

"I look forward to the day when British and American liberating armies will cross the Channel in full force and come to close quarters with the German invaders of France. You would certainly not wish me to tell you when that is likely to happen, or whether it be near or far, but whenever the great blow is struck you may be sure it will be because we are satisfied that there is a good prospect of continuing success, and that our soldiers' lives are expended in accordance with sound military plans and not squandered for political consideration of any kind."

This is a plain statement that the Channel will be crossed and that an invasion of north France is contemplated, to be effective at a date to be announced.

A considerable amount of preparation for this has already been made. It is no secret that invasion armies of American, British, and Canadian troops have been assembled in Great Britain for some time. They have been carefully trained for invasions. At least the American commanding generals have publicly addressed their men, stressing the need for constant preparation and readiness to initiate an invasion. Training has been intensified in order that the troops may be able creditably and successfully to meet the difficulties such a military operation will entail.

Extensive maneuvers in amphibious training have been held which, according to a British communique of 9 September last, have included the embarkation of a full force of invasion troops and their transportation across the Channel to near the French coast. During this trip the Air Force of the Americans and British furnished complete overhead cover, and in addition laid down an air preparation on enemy airfields in north France. The reports so far received indicate that no enemy plane interfered with the maneuver. As the enemy reports are not yet available, it is not known whether the enemy was aware of this expedition, or knew that it was a maneuver and not an invasion. The only real information available so far as to enemy reaction to an invasion is from the reports on the Dieppe expedition of last year.

The critical part of an amphibious invasion usually is in the first few days. Most expeditions, where the enemy has not advance information of the landing area, reach shore and are

usually initially engaged by weak defense forces. If the enemy can succeed in rapidly reinforcing the invaded sector before the invaders have consolidated themselves, the expedition may be thrown back into the water by counterattacks. They must therefore be prepared to receive violent assaults within a short period after their debarkation. From the defender's point of view, this should be as early as possible. It so happens that in north France the lines of communication are so complete that the enemy is in a position to concentrate very rapidly. To prevent him from doing so would be the primary duty of the Air Force, while the mission of the enemy's Air Force would be to cover the assembly of the ground troops.

It can therefore be expected that great air battles are likely to occur during the first hours of an invasion. If they do occur the ground troops may be able to proceed with their respective missions, being more or less uninterfered with by bombings while the conflicts in the air are taking place. Much will depend upon the weather. If clouds are low the enemy will profit thereby to assemble, and little interruption with his movements by air attacks will be possible; the air forces will do well if they are able to determine the enemy's approximate strength and dispositions.

If weather is good it will benefit the invaders, provided they have a superiority in the air—which appears now to be the case. In this situation they can protect their own troops and molest the enemy. A dark night favors the defenders similarly to a cloudy day. A bright moonlight favors the invaders, enabling their superior air forces to attack the enemy at the most advantageous places. The best time for an invasion is consequently during good weather and near the period of full moon. It would, however, be practicable (but less easy) to have an invasion during the winter season.

If the enemy is unable to throw an invasion force back into the sea, he may nevertheless have sufficient forces to confine the invaders to a coastal strip from which deployment would be

difficult. Such a situation occurred in the first World War at the Dardanelles, where the Allies succeeded in establishing themselves on shore and consolidating before the enemy could accumulate sufficient forces to overthrow them. But the Allies were never thereafter able to deploy from the narrow beachheads which they occupied, and eventually they abandoned the enterprise.

To avoid such a situation in north France it is necessary that the invasion be in such force that it can advance uninterruptedly inland to a depth of at least 50 miles, and preferably further if the invasion is on the north shore. If in Brittany, the invasion may rest with the cutting off of the peninsula; thereafter operations may be based on the Brittany front, on a new invasion along the Channel coast, or in a combination of both operations.

To insure the success of a landing on a continental coast, where strong enemy forces may be encountered, requires most careful planning from each of three points of view.

Strategy is responsible for the selection of the invasion area and its mission. This is a factor of one's own forces and of the enemy's forces and their mission.

Tactics is responsible for the correct execution of the landing and the proper equipment of the troops. This is a function of troop leading and of supply.

Logistics is responsible for the transportation of the invasion force to the landing area, and for thereafter rapidly supplying the forces on shore with a steady flow of reinforcements and of ammunition and supplies.

An invasion of north France is probably as difficult a military operation as any that can be conceived. It fully justifies the words of the Prime Minister of Great Britain: that it should not be undertaken until there is a prospect of not only *local* but of *continuing* success. It is to be made only when there is a reasonable probability of not only securing a beachhead, but of thereafter *continuing onward toward Berlin*.

TRAINING FILMS

Among recent training films of interest to artillerymen are:

- 3-957—Defense Against Incendiaries
- 3-1164—Construction of Gasproof Shelters in the Field
- 5-2018—Antitank Mine Doctrine and Methods—Part III—Employment of Antipersonnel Mines, Sections I & II
- 6-1201—Employment of a Field Artillery Battery Against Tanks
- 7-2023—Interior Guard Duty, The Sentinel
- 9-2007—Disposal of Unusable Ammunition and Explosives—Part I—General Principles, Disposal at Sea
- 9-2008—Same—Part II—Disposal by Burning
- 9-2009—Same—Part III—Disposal by Detonation
- 10-1202—Baking in the Field—Part I—The M1942 Field Baking Unit
- 10-1203—Same—Part II—Same, but without Gasoline
- 11-1199—Use of the Field Telephone
- 17-1083—The Tank Platoon, Bivouac and Outpost Security
- 17-1086—Field Expedients: Track-Laying Vehicles
- 17-1204—Vehicular Firing, M4 Medium Tank—Part I—Preparing for Action and Going Out of Action
- 18-2013—Direct Fire, The Tank Destroyer Section
- 21-1020—How to Get Killed in One Easy Lesson
- 21-2014—Baptism of Fire

Rapid Computations—II

By Capt. Alfred W. DeQuoy, FA

The first section of this article deals with rapid computations of fuze settings on time shell for the 105-mm and 155-mm howitzers, the second with the equally rapid determination of proper charges, *c*'s and elevations for these pieces. This procedure is extremely simple and accurate, and is designed to meet that emergency that well may arise when we will not have Firing Tables at hand. All we need to know is Tables A (complete with example) and D if we are with a 105 unit, or Tables B and E if with the 155s.

FUZE SETTING

You want to fire 105-mm time shell on a target at an estimated range of 5,500 yards. You have already committed the following table to memory:

Charge	1	2	3	4	5	6	7
Range	2,100	2,700	3,300	4,100	5,000	6,300	7,600
Time	10.2	12.2	13.9	15.7	16.8	19.4	21.5
Increase for every 100 yards .....	.6	.6	.5	.5	.4	.4	.4

Table A (105-mm How)

Estimated range to target	5,500
Next lower "range" in Table A (found under Charge 5)	5,000
Difference in hundreds of yards	5
"Increase for every 100 yards" under Charge 5 .....	.4
Total increase	2.0
"Time" under Charge 5	16.8
Computed time	18.8
Time given in Firing Tables	18.8

As an aid in memorizing Table A, observe that the first digit of each range listed corresponds to its respective charge (except for Charge 1). As can be seen from the table, Charge 1 is used from 2,100 to 2,600 yards inclusive, Charge 2 from 2,700 to 3,200, etc. For ranges less than 2,100 use Charge 1, decreasing .5 for every hundred yards' difference instead of increasing .6; this will prove accurate to as low a range as 1,300.

For medium artillery use:

Charge	1	2	3	4	5	6	7
Range	2,400	3,100	3,900	4,700	5,700	6,900	8,700
Time	11.8	14.2	16.3	17.9	19.4	21.1	No setting
Increase for every 100 yards .....	.6	.6	.5	.4	.4	.4	for this range with this charge

Table B (155-mm How)

Using Charge 1 and decreasing .5 for every hundred yards less than 2,400 will enable us to reach 1,500 yards.

Variations from settings printed in Firing Tables will occur as follows:

	105-mm Howitzer (1,300-8,600 yds.)		155-mm Howitzer (1,500-7,900 yds.)	
	Displacement		Displacement	
	No. of variations	of burst in yds.	No. of variations	of burst in yds.
No variation	27	0	23	0
Not over .1 point	45	20-30	33	19-31
Over .1 point, but not over .2 point	2	43-52	8	42-62
Over .2 point, but not over .3 point	0	0	1	77

Table C

Greater accuracy can be obtained, but this is not deemed proportionate to the effort involved in juggling more figures than those already presented. The Firing Table figures which we have used for comparison with our computations are listed in FT 105-H-3 and FT 155-V-1, and pertain to the 105 Shell HE M1 and 155 Shell HE M102, the standard projectiles for these weapons.

CHARGE, *c*, AND ELEVATION

In the June, 1943, issue of the FIELD ARTILLERY JOURNAL I described how an officer who had lost either his 105 howitzer or 155 howitzer Firing Tables could nevertheless, by memorizing only nine figures, compute within a few mils the elevation for any range, using charges 3, 5 and 7.

For the man who demands something better, as they say in the advertisements, we offer Tables D and E for the determination of:

1. The charge appropriate to the target range;
2. The elevation at this range. We will obtain a *variation of not over one mil* from that in the Firing Tables (taking the latter to the nearest whole mil), except at 4,000 and 6,200 yards for the 105, and at 6,000, 6,100 and 6,800 for the 155, where the variation will be two mils.

Charge	1	2	3	4	5	6	7
Range	Same as in TABLE A						
Elevation	269	300	310	316	289	297	285
<i>c</i>	17	15	13	11	8	7	6

Table D (105-mm How)

This table can be memorized in a few minutes. Thereafter, a little practice will enable you quickly to come up with the correct answer.

Before discussing the table, let's illustrate its use:

Estimated range to target	4,800
Next lower "range" in Table A (found under Charge 4)	4,100
Difference in hundreds of yds.	7
Table D: <i>c</i> for Charge 4	11
Difference in mils	77
Table D: elevation for Charge 4	316
Computed Elevation	393
Firing Table Elevation	392.6

Having determined that the proper charge is 4, range changes in the conduct of fire may be made by using the *c* listed under it.

If you are primarily interested in the 155-mm howitzer, substitute Table E for Table D.

Charge	1	2	3	4	5	6	7
Range	Same as in TABLE B						
Elevation	277	310	317	303	294	275	337
<i>c</i>	15	14	11	9	7	6	6

Table E (155-mm How)

If you wish to fire the 105 at a range less than 2,100 or the 155 at a range less than 2,400, substitute *c*'s of 14 and 13 respectively, and deduct from the elevation under Charge 1 instead of adding.

1st Question: Does this system give us the proper charge?

We know that, whenever possible, to lessen erosion and to maintain accurate fire, we should avoid using a charge at ranges less than 50% or greater than 75% of its maximum range. Our system abides fairly well by this rule. Glance at Table F. The second line shows the range at which we begin to use the charges listed above them; the third line shows the ranges corresponding to 75% of the next lower charge.

Charge	1	2	3	4	5	6	7
Table A	2,100	2,700	3,300	4,100	5,000	6,300	7,600
75% (of next lower charge)		2,870	3,350	3,960	4,820	6,220	7,610
62.5%	2,390	2,800	3,310	4,020	5,190	6,350	7,620

Table F (105-mm How)

Now, the 75% mark of a charge roughly approximates 62.5% of the next higher charge, e.g. 62.5 of Charge 3 is 3,310 yards and 75% of Charge 2 is 3,350; if we use the lower charge at this range we lessen erosion but are dangerously close to the maximum efficient range, which is 85%; if the higher charge is used erosion is increased, but we are halfway between the 50% and 75% limits and are thus allowed freedom in making range charges. Compare the fourth line in Table F with the other two.

For the 155-mm howitzer, substitute Table G for Table F.

Charge	1	2	3	4	5	6	7
Table B	2,400	3,100	3,900	4,700	5,700	6,900	8,700
75% (of next lower charge)		3,220	3,780	4,620	5,670	7,060	8,800
62.5%	2,690	3,140	3,840	4,720	5,880	7,340	7,970

Table G (155-mm How)

As a matter of interest, for both the 105-mm and 155-mm howitzers, the number of rounds equivalent in erosion effect to one full charge is:

Charge	1	2	3	4	5	6	7
	120	70	40	20	10	3	1

Table H

2nd Question: This system works up to 9,000 yards (73% of charge 7) using the 105 and up to 9,000 (77% of charge 7) using the 155. Can we compute for ranges greater than 8,900 and 9,700 for these respective pieces with similar accuracy?

Yes, with the 105, we can reach 9,900 (81% of charge 7) and be not over a mil off, if we remember:

Range	9,000
Elevation	371
<i>c</i>	7

With the 155, we can reach 10,600 (83% of charge 7) and be not over a mil off, by remembering:

Range	9,800
Elevation	406
<i>c</i>	7

3rd Question: Tables A and B cover ranges from approximately 62% to approximately 75% of the maximum range of each charge. Can we compute for ranges under 62% with similar accuracy?

Yes. However, I believe you will decide to do this only in the case of Charge 1; this matter has already been explained early in this article.

The problem is as follows:

Let us assume the range to be 4,000 yards and the ground to be level. Because of the erosion factor you normally would use Charge 4, but in this case you desire ricochets; you need a flatter trajectory, so you decide on Charge 5. Change the *c*'s in Table A to read:

Charge	1	2	3	4	5	6	7
<i>c</i>	14	13	11	8	7	6	5

Table I

Estimated range to T	4,000
Next higher range in Table A (found under Charge 5)	5,000

Difference in hundreds of yards	10
Table C <i>c</i> for Charge 5	7

Difference in mils	70
Table A elevation for Charge 5	289

Difference in mils	219
Firing Table Elevation	220

The lower limits for each charge will be:

Charge	1	2	3	4	5	6	7
Range	1,200	2,100	2,400	3,800	3,900	5,300	7,200
Percentage of maximum range of Charge	31%	47%	45%	59%	47%	52%	59%

Table J

For the 155, substitute Table K for Table I, and Table L for Table J.

Charge	1	2	3	4	5	6	7
<i>c</i>	13	12	10	8	7	5	6

Table K

Charge	1	2	3	4	5	6	7
Range	1,600	2,400	3,200	4,000	5,200	4,500	8,000
Percentage of maximum range of Charge	37%	48%	52%	53%	55%	38%	63%

Table L

Not in the BOOK

CORRECTING INSTRUMENTS FOR ANGLE OF SITE ERRORS

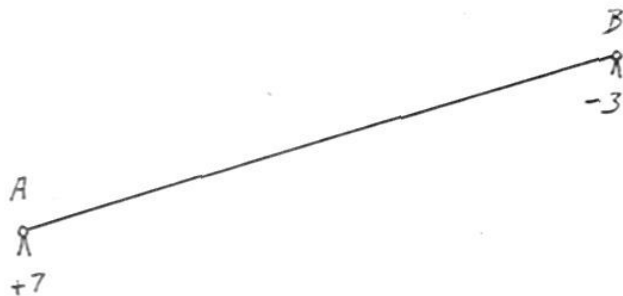
A surprising number of Field Artillerymen, upon being asked how to correct an aiming circle or BC scope for error in angle of site, appear not to have considered such correction necessary. Upon being pressed, they recommend taking a reading on an object the angle of site to which is known, either from map computation or by comparison with an instrument whose angle of site is known to be correct. Then they are sorry they brought the matter up, because they do not know that the angle of site of any instrument is correct.

There is a simple method, and one that does not require an accurate, contoured map nor a master instrument. It works on the principle by which we test the gunner's quadrant when we level the tube and then reverse the quadrant to see if the tube is really level.

Set up two markers at least 200 yards apart, each with a narrow horizontal line at the approximate height from the ground of the head of the instrument to be corrected. Call these markers A and B. Set the instrument up at A, with the center of the objective lens at the height of the horizontal line. Take site reading on horizontal line on marker B. Reverse the operation, with instrument at marker B, reading site on horizontal line on marker A.

Compute the algebraic mean of the two readings. This represents the error of the instrument. Change the sign. We now have the correction to be applied to any reading to obtain the correct angle of site.

As an illustration, suppose the reading from A to B is +5, and that



from B to A is -5 . The algebraic mean is 0, so there is no error. Suppose the readings from A and B are +7 and -3 , respectively. The algebraic mean is +2, which is the error of the instrument. Changing the sign we get -2 , which is the correction. Applying it to each of the readings, we get +5 and -5 , as the correct readings from A and B respectively. The fact that these two readings are the same figures with reversed signs checks the correction.

COL. MALIN CRAIG, JR., FA

MORE ON THE ADJUSTED COMPASS

We read with interest Sgt. Peterson's notes on measuring the adjusted compass (p. 707 of the JOURNAL for Sept., 1943). It is our experience that the operation will not be required more than once or twice a day, and as a result the long method is perfectly satisfactory. But if a short method is desired, by far the quickest and easiest is the following—a combination of pars. 32 and 91b of FM 6-40.

After aiming stakes are out, set up the aiming circle over the far stake and measure the compass to the sight of the piece by the usual

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.*

method. Thereafter, find the adjusted compass by subtracting the deflection from the measured compass if the stakes are on the left, or from the measured compass plus 3200 μ if they are on the right. If the sight of the piece changes position the aiming stakes will be out of line, but correction can be made by measuring with the sight of the piece, the angle between the two stakes—remembering that the line of fire has shifted left if the near stake is to the left, or right if that stake is to the right.

Conversely, if so desired the guns can be laid on any compass by announcing a deflection.

With this system the aiming circle is completely eliminated after the initial operation, and is available for other jobs away from the position. Any error will be constant, or at most with a 1 μ variation—a considerable advantage, considering some of the needles I have seen.

This method is convenient for windy hills, delayed occupation of position, or when the battery is short of aiming circles (as it might be in combat). The only caution is the usual one of taking reasonable care to have the near stake just halfway between the gun sight and the far stake, as this is the proposition on which par. 32 is based.

LT. SAMUEL C. MYER, FA

SPEEDING ADJUSTMENTS

In our battalion, after one battery adjusts it fires a time shell over the target; the other two lay on that burst. Their ranges are that of the adjusting battery, modified by the estimated range differences between batteries. They check with one round—and have never been off more than 25 yards in deflection and 100 yards in range. Then bingo!

LT. COL. GEORGE RUHLEN, FA

PRACTICE CONDUCT OF FIRE—ANYWHERE

Our battalion has developed a game, as yet unnamed, played with a "jeep" board (range deflection board) and a range deflection fan. One player conducts the fire (without seeing the board), the other plots the shots and senses them.

The plotter places a pin anywhere in the board to represent the gun and another to represent the target. The officer conducting fire then gives his opening commands; the plotter plots the first round anywhere, and senses it in relation to the O-T line. The firing officer then gives his next command, and the plotter, using the fan pivoted at the gun pin, plots this shot; the plotter then senses this new round as it would be seen from the OP (which of course is at the center of the circles described on the board). This procedure continues until a trial elevation is reached, it becoming too difficult after that to plot the small shifts.

No information is given to the firing officer to start the game off. He must determine on which side of him the guns are located, and all his factors, by comparing the sensings obtained with the commands given. In other words, he shoots himself in. Value of s , d , and r/R can all be determined by this method. The factor c is not used because range commands must be given in yards rather than by elevation, to enable the rounds to be plotted.

The game is best played on a range deflection board that has been blown up to a scale of 1/20,000, and using the issue 1/20,000 range deflection fan. When thus enlarged the board is about 22" \times 26".

CAPT. PETER FOX, FA

Diary of War Events

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

OCTOBER, 1943

- 1st Flying Fortresses based in North Africa fly 1,800 miles to raid the Munich area.
President Roosevelt nominates W. Averell Harriman to succeed Admiral Standley as U.S. Ambassador to Russia.
U-boats sink 10 ships of a Canadian-bound convoy.
- 2nd Allied troops continue to push north from Naples to the Adriatic.
Red Army advances 6 miles on Mogilev.
Flying Fortresses in Britain raid U-boat base of Emden with 1,000 tons of bombs.
Germany now using new type of torpedo. It combines the principles of magnetic guidance with acoustic detonation.
- 3rd The 5th Army around Naples continues to meet stiff resistance from German rear guard.
Germans launch a sea- and air-borne attack on the Island of Kos.
U.S. and British planes drop 500 tons of bombs on Munich.
14th U.S. Air Force destroy or damage 44 Zeros without losing a plane.
R.A.F. and U.S. fliers raid Kassel and Hanover. Lose 24 bombers.
- 4th U.S. 5th Army advances across the Caloce River.
British 8th Army in a surprise amphibious move lands at Termoli.
Germans endanger British troops by landing large force on the Island of Kos.
Moscow to be the scene of the Anglo-American-Soviet conference.
U.S. warships sink or cripple 40 barges laden with Jap troops evacuating Vila on Kolombangara Island.
- 5th German troops capture the Island of Kos.
R.A.F. again raid Frankfurt and Ludwigshafen. Lose 18 planes.
Russian army advances closer to Vitebsk.
Australians in New Guinea occupy Kaigulin, 60 miles south of the Jap base at Madang.
- 6th U.S. attack Wake Island. Heavily damage installations and destroy 60 planes, lose 13.
President Roosevelt asks Congress for Philippines full independence before July 4, 1946.
- 7th Russian troops advance along a 2,000-mile front.
German time-bomb kills 100 soldiers and civilians in Naples Postoffice.
German planes raid southeast England. Few hit London.
- 8th Retreating Japs from Kolombangara Island lose a cruiser and 2 destroyers in a night battle with U.S. Navy north of Vella Lavella.
Gen. Stilwell and Gen. Somervell arrive in India for conference with Adm. Mountbatten.
Russians threaten Kiev by developing bridgeheads on the Dnieper.
855 U.S. planes raid Bremen as well as Nazi bases in France.
- 9th 8th Air Force flies 1,000 miles to bomb Pomerania, East Prussia and Poland. Allied planes raid Hanover, Bremen and Berlin.
5th Army crosses the Volturno River on 20-mile front.
Allied planes bomb enemy positions in Greece and on Crete.
Red Army pushes Germans out of the Toman Peninsula and clears the Caucasus of Nazi troops.
- 10th U.S. bombers raid Muenster and Coesfeld in Germany. Shoot down 81 planes and wreck 21. Lose 30 bombers and 2 fighters.
Allied troops in Italy advance 1 to 9 miles despite heavy rains.
Allied forces occupy the Jap base at Vila, on Kolombangara Island.
U.S. send 2,289,700 tons of food to Allied fighting fronts during first 8 months of 1943.
- 11th Yugoslav Partisans capture Chesso and complete occupation of all islands along the country's Adriatic Coast.
10th Air Force Liberators fly 2,000 miles to raid Burma. Other Liberators fly 2,400 miles to pound Macassar.
- 12th Portugal grants Britain use of the Azores for a naval base.
Bad weather hampers allied troops in Italy.
4 Thunderbolts engage 32 Jap planes over Wewak, New Guinea, and shoot down 8 and probably 10 without a loss.
President Roosevelt reports that Allied subs sank 750,000 tons of Jap shipping during last 6 months.
- 13th MacArthur's forces wreck Jap base at Rabaul. Destroy 12 planes and sink or damage 123 ships.
Italy declares war on Germany.
- 14th U.S. Flying Fortresses raid Schweinfurt. Destroy 104 planes and lose 62. 5th Army advances to within 100 miles of Rome.
- 15th British make sea-borne landing north of the Volturno's mouth and establish bridgehead.
Maj. Gen. Wedemeyer is named Chief of Staff to Admiral Mountbatten.
- 16th Allied troops push the Germans back along the road to Rome.
- 17th Japs lose 104 planes in trying to take the initiative in the southwest Pacific. We lose 2.
Russians threaten Dnieper line by advancing near Kremenchug.
O.W.I. reports the ratio of planes destroyed since Pearl Harbor is 4 to 1 in our favor. 14th Air Force in China has best record of 9 to 1.
- 18th Stiff resistance and German counterattacks slow up our advance in Italy.
Russians kill 2,000 Germans in a raid on Melitopol.
Secretary of State Hull, Ambassador Harriman, and British Foreign Secretary Eden arrive in Moscow for conference.
MacArthur's forces repulse two Jap attempts to land near Finschhafen on New Guinea. Shoot down 24 planes.
- 19th Russians capture Pyatikhatka.
The 5th Army pushes Germans out of their entire Volturno line.
Allied fliers sink 8,000-ton Jap transport off New Ireland. Other fliers raid Rabaul and destroy 60 planes, 30 in the air and 30 on the ground.
- 20th Flying Fortresses of the 8th Air Force raid Dueren. Shoot down 11 planes, lose 8.
- 21st Russian troops clear Germans from the center of Melitopol, gateway to the Crimea.
British 8th Army captures Oratino and Busso, which dominates the highway to Rome. R.A.F. raid Leipzig.
- 22nd British and Canadian fliers bomb aircraft and locomotive center of Kassel.
Northwest Africa Air Force bomb railways and bridges on the road to Rome. 5th Army continues advance north of Volturno.
U.S. fliers bomb Evreux-Fauville.
- 23rd Russians drive last Germans out of Melitopol.
5th and 8th Armies advance in face of stiff German counterattacks.
- 24th U.S. Marauders from Britain raid airfields in France. R.A.F. bombs Cherbourg and airfields in the Netherlands.
Allied forces in the Southwest Pacific destroy 23 Jap planes and 2 cargo ships at Wewak.
- 25th Russians recapture Dniepropetrovsk, great southern industrial center.
5th and 8th Armies continue slight advances.
Allied fliers shoot down 15 planes north of Florence.
In a two-day attack on Rabaul, U.S. fliers destroy 123 Jap planes and probably destroy 45 more. Other Allied fliers destroy 202 planes, 1 destroyer, and 5 coastal vessels.
- 26th 5th Army advances 10 miles and captures Francolise. 8th Army advances to capture Bojano, 15 miles from Isernia.
Russians continue advances.
- 27th Russians force back entire German line.
Allied progress in Italy slows down as Germans dig in on the Mondragone-Vasco line.
Allies bomb Rabaul. Destroy 48 planes. Lose 1 bomber.
- 28th The retreat of thousands of Germans from the Dnieper bend cut off by Russians.
British and Canadian forces advance 4 miles to cross the Biferno River and capture Torella. 5th Army captures Riardo.
Allied amphibious forces land on Mono and Stirling Islands in Treasury group below Bougainville Island.
- 29th President Roosevelt reports Moscow conference tremendous success.
Allied armies in Italy continue advances.
Gen. MacArthur's paratroops land on Choiseul Island, south of Bougainville in the Solomons.
- 30th Russian troops continue to close in on Germans in the Crimea.
5th Army in Italy crosses the Regia Canal and captures Mandragone.
Flying Fortresses of the 12th U.S. Air Force bomb Genoa.
- 31st Bad weather slows up activity in Italy.
Allied bombers raid Rabaul. Destroy 45 Jap planes. Lose 4.



For Heroism and Service



DISTINGUISHED SERVICE CROSS

CAPT. FELIX P. SETTLEMIRE, for extraordinary heroism in action near Sedjenane, Tunisia, on April 23, 1943. While in command of a small observation party, Capt. Settlemyre was surrounded by enemy troops. Still alert to opportunity even beyond his predicament, he noticed that the regimental commander and his observation party had been captured. With bold initiative and acute judgment, regardless of his own safety, he escaped and contacted a nearby platoon. Then heroically inspiring all under him, shouting encouragement, he proceeded ahead of the platoon, under heavy machine gun fire and hand grenades. His efforts were responsible for the rescue of the regimental commander and his party. Capt. Settlemyre's initiative and epic heroism were a profound inspiration to all who saw him. His achievements were performed in a manner exemplary of the most notable in Army tradition. Address, 214 N. Fisher St., Jonesboro, Arkansas.

NAVY CROSS

2ND LT. THOMAS C. MATHER, USMCR, for extraordinary heroism as Officer in Charge of two half-track tank destroyers during action against enemy Japanese forces on Guadalcanal, Solomon Islands, on the night of October 23-24, 1942. When the half-tracks under his command sustained two casualties during heavy machine gun and mortar fire which preceded a hostile tank attack launched against a position held by the Marines at Matanikau River, Lt. Mather was rendered unconscious by concussion from a mortar explosion. Immediately upon recovery, with utter disregard for his own condition, he mounted one of the half-tracks, fired the gun, and directed the attack on the enemy tanks until, under his skillful and effective control, the tank destroyer disabled five 15-ton tanks. His courageous initiative and timely aggressiveness in a critical emergency were in keeping with the highest traditions of the United States Naval Service.

CPL. THOMAS A. WATSON, USMCR, for extraordinary heroism as a forward artillery observer during action against enemy Japanese forces on Guadalcanal, Solomon Islands, on September 13-14, 1942. While a Marine Raider Battalion was defending a ridge about 1,000 yards south of the Guadalcanal Airport against a desperate attempt by hostile forces to seize that airport, Cpl. Watson, from an observation post a few feet in rear of the front line, directed the fire of his battalion so effectively that the enemy attack was disrupted and all efforts to dislodge defending troops were repulsed with heavy losses. Surrounded by and exposed to deadly fire from Japanese rifles, machine guns, hand grenades, and mortars which were concentrated in the vicinity of his post, he carried on with relentless aggressiveness and complete disregard of personal safety. His unyielding devotion to duty was in keeping with the highest traditions of the United States Naval Service.

SILVER STAR (Posthumously)

T/5 PRESTON J. MALONEY, for gallantry in action. In March, 1943, while his battery was engaging the enemy in Tunisia, he was given the mission of establishing a forward telephone switchboard. He installed and maintained these communications during heavy bombing attacks without regard for his own personal safety. On one occasion he was thrown from his machine gun by concussion from an enemy bomb. By

his heroic actions in the face of constant enemy fire he was largely responsible for the continued communications of this brigade without which our artillery fire would not have been effective, and exemplifying the highest traditions of our armed forces. He was killed in action by an enemy bomb on March 31, 1943. Father, Warden Maloney, Box 2, Waymart, Pa.

SILVER STAR

T/5 JOHN H. ARBER, for gallantry in action. A self-propelled 105-mm howitzer had been set afire as a result of enemy shelling, and abandoned. With complete disregard for his own welfare, T/5 Arber entered the burning vehicle and drove it for about two hundred yards. The intensity of the fire compelled him to stop. He dismounted and with the assistance of others extinguished the fire, while under intermittent enemy shelling. The initiative, courage, and daring and heroic actions of T/5 Arber prevented the complete destruction of a valuable piece of government equipment; they reflect great credit upon himself and the command and are deserving of the highest praise. Address, 1108 W. High St., Springfield, Ohio.

CAPT. ROY C. BREWER, for gallantry in action. He voluntarily requested and received permission to go alone into enemy territory for the purpose of reconnoitering enemy positions and adjusting fire upon enemy artillery located in otherwise invisible areas. He spent two nights and a day in constant danger from enemy action. Although his radio communication failed, he returned with important and timely information concerning enemy dispositions and terrain. The courage, initiative, and devotion to duty with disregard for his own welfare displayed by Capt. Brewer reflect great credit upon himself and the command and are highly commendable. Address, 216 Parker Ave., Andalusia, Ala.

CAPT. PAUL W. BROWN, for gallantry in action. Capt. Brown personally and voluntarily led a platoon of his company forward to fire on advancing enemy tanks and cover the withdrawal of American forces. Although under heavy combined enemy artillery, tank, small arms fire, and dive-bombing attacks, Capt. Brown completely disregarded his own welfare by continuously exposing himself to enemy observation and fire in order to more efficiently direct and control the action of his men. As a result of his daring and heroic actions three enemy tanks were destroyed and others were damaged. He removed his platoon only after the American forces had withdrawn and he had successfully completed his mission. While personally directing the withdrawal of his platoon he was wounded, evacuated, and then captured. The gallantry, aggressive leadership, and devotion to duty with disregard for his own welfare displayed by Capt. Brown reflect great credit upon himself and the command and are deserving of highest praise. Address, 801 Glacier Heights Road, Youngstown, Ohio.

MAJ. LOREN D. BUTTOLPH, for gallantry in action. The artillery command post was subjected to heavy enemy artillery fire. Maj. Buttolph completely disregarded his own welfare by remaining out in the open, directing the men to safety. He then inspected the area to see if everyone was under cover and if anyone had been wounded. Upon finding a wounded soldier he carried him to a slit trench and cared for him until a medical officer could be obtained.

The gallantry, determination, and concern for the welfare of the men with disregard for his own displayed by Maj. Buttolph reflect great credit upon himself and the command and are highly commendable. Address, 914 5th St., Ames, Iowa.

PVT. 1ST CLASS LOUIS EIDLEBERG, for gallantry in action in Tunisia. During heavy counterbattery fire on his battery position two men were wounded and unable to reach shelter. Pvt. 1st Class Eidleberg ran to the wounded men and began administering first aid to them. Although the position continued to receive heavy artillery fire he disregarded his own welfare by remaining with the men calmly and efficiently completing his first aid treatment. He then placed them in a vehicle and drove them through heavy fire to the battalion aid station. The gallantry, efficient performance of duty, and concern for the welfare of his wounded comrades displayed by Pvt. 1st Class Eidleberg reflect great credit upon himself and the command and are highly commendable. Address, 5108 12th Ave., Brooklyn, N. Y.

CAPT. DONALD C. GRANT, for gallantry in action in April and May, 1943, on Hill 609 in Tunisia. Capt. Grant was serving as Liaison Officer and was conducting effective artillery fire upon enemy troops, tanks, vehicles, and gun positions. With enemy rifle, machine gun, mortar and artillery shells falling on and around his position, and enemy aircraft bombing and strafing the position, Capt. Grant remained in front of his infantry and conducted effective artillery fire upon the enemy. His conduct, leadership, and attention to duty in the face of grave danger were exemplary and a credit to the armed forces of the United States. Address, 288 James Ave., South, Minneapolis, Minn.

S/SGT. CARROLL W. GUY, for gallantry in action in New Guinea, July 3, 1943. Address, Troy, Tenn.

CAPTAIN WADE H. HITT, USMC, for conspicuous gallantry and intrepidity during action against enemy Japanese forces on Guadalcanal, Solomon Islands, from October 31 to November 14, 1942. While serving as Artillery Liaison Officer during an offensive west of the Matanikau River, Capt. Hitt not only performed his duties at the Command Post in an outstanding manner, but also, when lack of observation prevented accurate control of fire from that position, unhesitatingly proceeded to positions occupied by advance elements of assaulting units. In one instance, after an enemy artillery emplacement and dump had been located ahead of the right assault battalion, Capt. Hitt, accompanied by a small patrol, advanced beyond our lines with a telephone and, under vigorous machine gun shelling, directed artillery fire on this target and killed six Japanese. Carrying on until wounded in the neck and ear, he contributed greatly to the successful accomplishment of two objectives and to the maintenance of our positions against hostile attack.

CAPT. LUCIEN W. HOULE, for gallantry in action in April and May, 1943, on Hill 609 in Tunisia. Capt. Houle was serving as Liaison Officer and was conducting effective artillery fire upon enemy troops, tanks, vehicles, and gun positions. During this time he was constantly under heavy enemy rifle, machine gun, mortar and artillery fire and numerous times was in positions in front of the infantry which his artillery was supporting. With enemy rifle, machine gun, mortar, and artillery shells falling on and around his position, and enemy aircraft bombing and strafing the position, Capt. Houle continued to remain in front of his infantry and conduct effective artillery fire upon the enemy. His conduct, leadership, and attention to duty in the face of grave danger were exemplary and a credit to the armed forces of the United States. Address, 322 University Ave., Northeast, Minneapolis, Minn.

LT. COL. JOHN W. McPHEETERS, for conspicuous gallantry in action in Tunisia. He aggressively maneuvered a battery of his battalion to a position from which it could place effective fire on enemy vehicles and personnel using the road to supply the forces. In the face of heavy enemy fire he personally located and established observation posts and selected a battery position in order to interdict

the road. He continuously disregarded his own welfare in his selection and location of positions from which this battery could be most effectively controlled and directed. As a result of his efficient efforts this battery destroyed a total of 90 enemy vehicles. His gallantry, aggressiveness and disregard for his own welfare reflect great credit upon himself and the command and are highly commendable. Address, 46 S. Ritter St., Indianapolis, Ind.

CAPT. STANLEY MALLESS, for conspicuous gallantry in action in Tunisia. When the battalion trains were subjected to a combined enemy attack by air, artillery, foot troops and tanks, and all friendly troops had withdrawn from the area, Capt. Malless voluntarily and unhesitatingly remained behind with them to assist in their safe evacuation. He continuously disregarded his own welfare and constantly exposed himself to close and heavy enemy fire in his assistance to personnel and vehicles. This voluntary and self-assumed duty displayed reflects the finest traditions of the armed forces and is deserving of the highest praise. Address, 148 W. Hampton Drive, Indianapolis, Ind.

2ND LT. DONALD F. NELSON (then S/Sgt), for gallantry in action in April, 1943, in Tunisia. S/Sgt. Nelson with two other men proceeded to establish communications between a forward observation post on Hill 409 and the battalion command post. After advancing several hundred yards they were taken under heavy enemy artillery and mortar fire. Even though warned by their infantry to take cover, he and the two other men did not stop until the communications were established between the observation post, which was out in front of his infantry, and his battalion command post. Effective counterbattery fire was immediately conducted from this observation post. His courage, leadership and attention to duty in the face of grave danger were exemplary and a credit to the armed forces of the United States. Address, 210 W. First St., North, Marshall, Minn.

CAPT. WARREN BRUCE PIRNIE, JR., for gallantry in action. After his battery had been overrun by enemy tanks he contacted one of his gun sections, and under very heavy and close enemy fire personally placed direct fire on advancing tanks. When forced to abandon his position he led his men to the top of a ridge. They subsequently were surrounded by the enemy. He remained here under continual enemy fire and frequent infantry attacks observing for a nearby friendly infantry regiment. He then, without the aid of a map or compass, led his men over a distance of approximately 25 miles through enemy territory and rejoined his unit. The courage, aggressive leadership, and outstanding devotion to duty with complete disregard for his own welfare displayed by Capt. Pirnie saved the lives of many soldiers and prevented the capture or destruction of several vehicles. His actions reflect great credit upon himself and the command and are deserving of the highest praise. Address, Concord, Mass.

CAPT. RICHARD M. ROSSBACH, for gallantry in action in Tunisia. While acting as a forward observer for his battery, the infantry troops whom he was accompanying disappeared when he was attempting to locate a position for an advanced observation post. Believing that they had gone forward, he proceeded up a dry river bed for a considerable distance until he became aware of the presence of a small body of enemy troops in his vicinity. With complete disregard for his own welfare, he then alone, and armed only with a tommy gun, advanced forward, surprised the enemy and captured six of them. His gallantry, daring, and initiative reflect great credit upon himself and the command and are deserving of the highest praise. Address, White Plains, N. Y.

PVT. 1ST CLASS PETER A. RYAN, for gallantry in action in March, 1943, in Tunisia. During the fiercest action of the day, Pvt. Ryan was on duty with a telephone line repair section. With complete disregard for his own safety and regardless of the fact that his area was under continuous heavy enemy artillery fire, he constantly patrolled his lines and repaired all breaks in the line as they occurred. His bravery, coolness under fire and devotion to duty were meritorious and a credit to the armed forces of the United States. Address, 2404 Central Ave., Minneapolis, Minn.

CAPT. WOODROW M. SMITH, for gallantry in action in April and May, 1943, on Hill 609 in Tunisia. Capt. Smith was manning a battalion observation post and was conducting effective artillery fire upon enemy troops, tanks, vehicles, and gun positions. With enemy rifle, machine gun, mortar and artillery shells falling on and around the observation post and enemy aircraft bombing and strafing the position, Capt. Smith remained in front of his infantry and conducted effective artillery fire upon the enemy. His conduct, leadership, and attention to duty in the face of grave danger were exemplary and a credit to the armed forces of the United States. Address, 2820 Fifth St., Peru, Ill.

PVT. 1ST CLASS MORRIS S. SWEET, for gallantry in action in April, 1943, in Tunisia. Pvt. 1st Class Sweet, with two other men, proceeded to establish communications between a forward observation post on Hill 409 and the battalion command post. After advancing several hundred yards they were taken under heavy enemy artillery and mortar fire. Even though warned by their infantry to take cover, Pvt. 1st Class Sweet and the two other men did not stop until the communications were established between the observation post, which was out in front of his infantry, and his battalion command post. Effective counterbattery fire was immediately conducted from this observation post. His courage and attention to duty in the face of grave danger were exemplary and a credit to the armed forces of the United States. Address, 1117 14th Ave., Southeast, Minneapolis, Minn.

LT. COL. PERCY W. THOMPSON, for gallantry in action. During an engagement with the enemy, Lt. Col. Thompson went on reconnaissance patrol several miles beyond our lines to locate artillery positions for his battalion. Lt. Col. Thompson's devotion to duty and bravery under fire inspired the men of his battalion. Address, Gainesville, Fla.

CPL. GEORGE K. WEINBERG, for gallantry in action. He observed a wounded soldier who was unable to reach shelter. He voluntarily and unhesitatingly disregarded his own welfare by going through heavy enemy mortar fire to reach the injured soldier. Upon reaching him, and while still under enemy fire, he administered first aid treatment, helped dress his broken leg using part of his own clothing as a tourniquet, and then evacuated the wounded soldier to an aid station approximately a mile away. The gallantry, perseverance, and concern for the welfare of a wounded soldier with complete disregard for his own displayed by Cpl. Weinberg reflect great credit upon himself and the command and are highly commendable. Address, 37 Raymond St., Providence, R. I.

LETTER OF COMMENDATION

SGT. SAMUEL H. COBB, JR., USMC, for meritorious conduct in action against the enemy while serving with a Marine battalion on Guadalcanal, British Solomon Islands, during the period from October 11 to October 31, 1942. In addition to his regular duties as section

leader of a gun group, which he conducted in an outstanding manner, Sgt. Cobb performed outstanding service in locating enemy artillery positions and helping to direct our artillery in its efforts to neutralize those positions. On several occasions he left places of comparative safety and exposed himself to intense enemy shell fire so that he could more accurately locate enemy positions. His conduct, at all times, was in keeping with the highest traditions of the United States Naval Service.

CAPT. ANDRE D. GOMEZ, USMC, for meritorious conduct in action against the enemy while serving with a Marine battalion on Guadalcanal, British Solomon Islands, October 25, 1942. Capt. Gomez commanded an artillery shore battery. Three Japanese destroyers opened fire on two mine sweepers, setting them aflame, and closed in to capture or machine gun the survivors. Capt. Gomez opened fire with his battery, causing the enemy ships to turn away from the burning mine sweepers to engage the shore battery. With complete disregard for his own safety he remained on his control tower, where he was exposed to heavy fire from the Japanese destroyers, and directed his battery with such telling effect that one of the enemy craft was set aflame. Capt. Gomez's courageous and decisive action saved the crews of the mine sweepers from capture or death. His conduct was in keeping with the highest traditions of the United States Naval Service.

CAPT. LEWIS A. JONES, USMC, for meritorious conduct in action against the enemy while serving with a Marine Battalion on Guadalcanal, British Solomon Islands, September 13, 1942. With complete disregard for his own safety Capt. Jones, commander of a shore battery, remained at his observation tower while it was being shelled by four Japanese warships offshore, and directed the fire of his battery with such skill that one of the enemy craft was damaged and the remainder were forced to withdraw beyond range of the battery. As a result the fire of the enemy fell short of the beach and was ineffective. His conduct was in keeping with the highest traditions of the United States Naval Service.

2ND LT. WILLIAM D. MOODY, USMCR, for bravery and devotion to duty under adverse conditions during an engagement with the enemy on Guadalcanal, British Solomon Islands, on October 23, 1942, and October 24, 1942. During his engagement Lt. Moody served as artillery liaison officer, performing outstanding services in collecting and compiling firing data from the forward observers. Under constant danger from heavy shelling by enemy warships, aerial bombardment and strafing, he showed great bravery and skill. His calm and accurate control of the artillery fire of his unit caused it to inflict heavy damage on the enemy and contributed greatly to the repulse of the enemy and the resulting Marine successes. His conduct was in keeping with the highest traditions of the United States Naval Service.

DEAN HUDNUTT

It is the painful duty of the Executive Council of the United States Field Artillery Association to announce to its members the death, on Saturday, October 11, 1943, of Colonel Dean Hudnutt, Field Artillery, sometime Secretary-Treasurer of the Association and Editor of *The Field Artillery Journal*. At the time of his death he was serving as Professor of Military Science and Tactics at Yale University.

Serving the Association from 1932 to 1936, he skillfully piloted its affairs through the difficult period of the depths of the depression. At the same time his broader interests continued. Through his human kindness, Field Artillerymen the world over contributed to help furnish a North Dakota farm boy with an old artillery pair, so badly needed to help work his father's farm. An expert pistol shot, he continued his hobby by serving as Captain of the United States Olympic Pistol Team which competed at Berlin.

His untimely passing leaves a void difficult to fill.

BOOK REVIEWS

NAPOLEON AND MODERN WAR: His Military Maxims Revised and Annotated. By Col. Conrad H. Lanza. 158 pages, Military Service Publishing Co. \$1.00.

Of all early military thinkers and writers who have recently been refurbished, none has been more ably and concisely dusted off than is Napoleon in this splendid annotation.

Drawn from letters and memoranda, mostly from the St. Helena period, these Maxims are generally considered to consist of 115. From time to time, and in various languages, they have received some expansion, analysis, annotation. But as warfare itself changes, so must these "interpretations" keep pace with the times.

Col. Lanza has a breadth of training and experience that thoroughly qualify him for this undertaking. In illuminating the Maxims he has kept two points in mind: he stresses their timeless soundness, and he clearly shows how applicable they are to warfare today despite mechanical and other technical advances far beyond the wildest dreams of any of Napoleon's contemporaries. He uses modern and well known references and examples, with the result that this is as useful and readable a book on military fundamentals as you'll find.

THE HIDDEN ENEMY: The German Threat to Post-War Peace. By Heinz Pol. 281 pp.; bibliography; index. Julian Messner, Inc. \$3.00.

Here is still another analysis of "the German problem." Heinz Pol, German liberal editor now in America, rejects the idea that all Germans are inherently bad as well as the other extreme that only Hitler and a handful of Nazis are corrupting the country. His choice for the villains of both World Wars is the entire German ruling class, the guiding spirits of a 50-year-old imperialistic movement known as pan-Germanism.

It is this elite of military leaders, landed aristocrats, and industrialists that is the hidden enemy—hiding first behind the facade of Kaiserism, now behind that of Nazism, which is here regarded as merely the newest and most acute outcropping of pan-Germanism. But, we are warned, this elite already is deserting Hitler in the hope of being chosen by the Allies to rule post-war Germany.

Most of the book is original, well documented, and merits attention, but much is oversimplified. This holds true too of Mr. Pol's solutions: a calculated purge by the German people themselves of some half-million "Nazis"; no deals with any group of the pan-German elite; and Allied encouragement of a German democratic revolution. A. L. O.

RETREAT FROM ROSTOV By Paul Hughes. 586 pages. Random House. \$2.75.

Every once in a while a novelist captures and holds the full spirit and meaning of history. Such is the case of *Retreat from Rostov*. Historically accurate, with its ebb and flow governed by the marching and countermarching above the Sea of Azov, it covers 34 days in the late fall of '41. Soldiers and civilians, peasants and partisans—all thread through this remarkable tale of fluid warfare.

THE NEW EUROPE. By Bernard Newman. 562 pp.; index; maps. The Macmillan Co. \$3.75.

At the 1919 peace table the map of Europe was redrawn. The instant active fighting ceased, partisans of national groups hastened to seize or otherwise lay claim to the territory they thought their groups *should* have—and with insignificant change, these were the boundaries fixed by the peace treaties. In considerable measure these arbitrary lines laid much groundwork for the present war—Teschén is a notable case in point. For a variety of reasons many boundaries must be drawn or revised after this war. How will we go about the job? Will we be blind and arbitrary? listen to nationalistic partisans only? or try to understand the problems involved, and seek a sound and reasonable solution?

Bernard Newman terms his book "a sort of elementary hand-book to the Peace Conference; a plain statement of the problems which have to be solved; a primer, to encourage the study in more detail and from more authoritative specialized books on the intricacies of the problems involved. It makes no pretense of offering final solutions: its main aim is to present the problems fairly and dispassionately."

This job is done, and done well. In a tour of the frontiers, and the countries on *both* sides of them, Mr. Newman mingles information drawn from official sources and from history (which he knows well), with that gathered in 12 years of traveling throughout Europe. A good bit of his journeying was in such restless areas as the Baltic and the Balkans. Much of it was leisurely, by bicycle; this gave him a chance to see things at close hand rather than merely flash past, and—what is more—to talk with the plain people everywhere.

As a result he doesn't just give a rewrite of reference books. Temperaments, characteristics, and background of the peoples are the mainstay. The backgrounds of aspirations help one understand national catch-phrases. Whys and wherefores, then, are what you can gain from this fine resume.

DISCOUNT OFFER AND MAILING DATA

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VERTICAL WARFARE. By Francis Vivian Drake. 139 pages; illustrated. Doubleday, Doran & Co. \$3.00.

This book presents the bombing program on which our Army Air Force and the R.A.F. base their present operations and their plans. It describes our famous bombsight, and includes the first detailed account of the U. S. program of precision bombing against all targets. It also presents over 50 excellent photographs. M. K. W.

ON WAR. By Carl von Clausewitz. 631 pages. Modern Library \$1.45.

In the past year we have found more and more of Clausewitz's writings become available. *Principles of War*¹ is a distillate of the essence of Clausewitz. *Clausewitz on the Art of Warfare*² abstracted considerably more from *Vom Krieg*. Here at last is the full text of that highly important 19th Century book.

True, in many places it is tortuous, involved, and windy. Like most Germans Clausewitz liked to expound on the obvious as though it were a profound discovery of his own. Nonetheless he was realistic. He viewed war as a total war—ruthless, direct, all-inclusive, unlike the traditional fencings and mincings of small, professional armies whose maneuverings affected only their immediate vicinity. His mark can be seen in the German military dynasty and hierarchy; the German General Staff shows the results of his teachings.

O. J. Marthuis Jolles of the Institute of Military Affairs of the University of Chicago made this translation, and wrote an illuminating introduction. Dean Richard McKeon of that university's Division of the Humanities furnishes a foreword.

THE REPUBLIC. By Charles A. Beard. 365 pages. The Viking Press. \$3.00.

In the writing of his book, *The Republic*, Charles A. Beard has achieved a nice balance between authoritative scholarship and easy informality. He has adapted his theme to a sort of intimate seminar treatment in which the reader, identified with one member or another of the group, has a vicarious sense of speaking up on debatable points. Or the conversational form of the book might be called the historian's fireside manner. Whatever its term, the unique form is an effective means of accomplishing the purpose of the book.

The introduction presents Dr. and Mrs. Smyth, friends fictitiously created for the author's purpose. Through conversation with them Mr. Beard takes account of the confusion that arises from superficial and conflicting pronouncements about our government, the prejudice and personal or sectional interests that distort the statements of would-be leaders.

Mr. Beard agrees with his friends that an organized, dispassionate study of our government is necessary to a clear understanding of its issues. They arrange to meet weekly and carry on among themselves an informal course of study of the subject.

There follows, in the form of open discussion, a critical examination of the Constitution and the elements that have contributed to its preservation. Popular myths are dispelled in the clear light of historical research, and some little known, rather astonishing facts are brought out.

The reader is bound to close this book with a new knowledge of the Constitution and a feeling of more intimate acquaintance with the fundamental principles of our government. F. E. J.

REFLECTIONS ON THE REVOLUTION OF OUR TIME. By Harold J. Laski. 419 pages. The Viking Press. \$3.50.

Mr. Laski views the present conflict as a part of a revolution which has been continuing for some time, the end of which is not in sight. This revolution has three aspects:

The Russian concept of the revolution.

The Fascist concept of counter-revolution.

The Democratic concept of indecision and ignorance concerning the revolution.

¹Military Service Publishing Co.; \$1.00.

²Longmans, Green and Co.; \$1.50.

Mr. Laski sees the world undergoing a change, or perhaps growing up. In this sense it would be comparable to the growth of a child. It is a natural growth, and cannot be stopped—but it can be either warped or assisted to healthy adulthood.

To the Russians, the Revolution has been going on for some time and, according to Mr. Laski, they have been aware of the revolution and have endeavored to aid it along according to the understanding they have of the Revolution, and the type of world they are wanting to create.

Fascism, on the other hand, has clearly seen the Revolution and the Russian participation in it, but has endeavored to delay if not destroy that revolution and substitute for it the rule of the very few over the subjugated many.

The democracies have not seen clearly the impending changes and have as a result foundered in a sea of doubt and indecision. To them, the question has resolved itself as the conflict between the Russians and the Germans—a clash fostered by the German desire to expand eastward into the rich food lands of the Ukraine. History seems to bear out this concept of Mr. Laski's. According to Hitler's own writings the original Fascist—or Nazi—intention was to strike eastward, absorbing as much of the territory lying between Germany and Russia as was possible, before the Russian Bear was aroused. The English and French determination to aid Poland in case she were invaded was a factor which the Germans never thought possible. They were confident that the democratic nations would sacrifice Poland, as they had Czechoslovakia, and that once the eastward land grabs were consummated and digested Russia could be dealt with at Germany's leisure. During this time, it was thought by the Fascist school of diplomats and politicians, the democracies could be lulled into passivity with the conditions existing, by pointing out that Germany was merely ridding the world of the Red Menace. With the Red Peril eliminated, it would have been the Nazi blueprint to present the slumbering democracies with a *fait accompli*. Germany would then have been in the position to present its ultimatum to the Democracies. Either the democracies would have had to acquiesce to the new status quo which would have been the German domination of most of the world, in concert with Japanese supremacy in Asia, or they would have had to wage a battle against monumental odds. It was felt in the Fascist camp that the vested interests and large economic comptrollers in the democracies would have been content to continue cartel arrangements and accept a subordinate position in the German-Japanese domination of the world, provided their interests were not too affected and the masses placed in their proper perspective: that of workers, not partners. English and French determination to stand by political and military commitments with Poland threw this entire Fascist plan into the discard.

To Mr. Laski the way open to the world at the present time is that it profit from the lessons already written, taking advantage of the time granted by the war now being waged to plan clearly for the benefit of the many, else the many, faced with a return to management by the few, will rise and accomplish the results in blood and destruction.

This present work is involved and it is difficult to give a cursory explanation, for the theme is that the world is not faced with a series of conditions that may be altered or conditioned by mechanics, science, politics, or even religion, but with a steady immutable growth of an idea organism which will achieve fruition in spite of aid or hindrance by the inhabitants of the world. At the same time, the inhabitants of that world are a necessity to the idea organism, for it is for their benefit that this fruition is to be.

A. E. G.

THE UNKNOWN ARMY. By Nikolaus Basseches. 239 pp. The Viking Press. \$2.50.

This book's title excuses somewhat the general attitude toward Russian military successes—that a miracle had been accomplished. The author effectively disproves the miracle by showing what is not generally known: that the Soviets had succeeded in educating and training, psychologically as well as physically, every available man and woman for war-time duties.

The nature and history of the Russian military forces are discussed, from earliest days when obligation to military service was based on possession of land; the birth of the Russian Army under Peter the

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Great; the period of Prussian tutelage; the total dissolution of the Army in 1917; to the building of the present war machine under the Five-Year Plans.

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GERMANS IN THE CONQUEST OF AMERICA. By *Germán Arciniegas*; translated by *Angel Flores*, 212 pp.; bibliography; endpaper map. The Macmillan Co. \$2.50.

Sixteenth century German ventures into the "new world" for exploration and exploitation suggest interesting parallels today. Economic and military conquest went hand in hand then as now, apparently. Two powerful German banking houses rivalled the Spanish and Portuguese conquistadors in the conquest of South America; and the methods of the sixteenth century German merchant-bankers (and

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their agents) recall some of those followed by twentieth century Nazis.

This rather too-well-documented "history with a purpose" is an amalgamation of quotes from sixteenth century writers and others, fragmentary and slightly monotonous despite the lively and pertinent connecting passages by Señor Arciniegas.

The author, a former Minister of Education of the Colombian Republic (1942), is now in the United States under the auspices of the Hispanic Institute lecturing at Columbia and Chicago universities.

F. B.

MATHEMATICAL RECREATIONS. By Maurice Kraitchik. 323 pp.; index; illustrated. W. W. Norton & Co., Inc. \$3.75.

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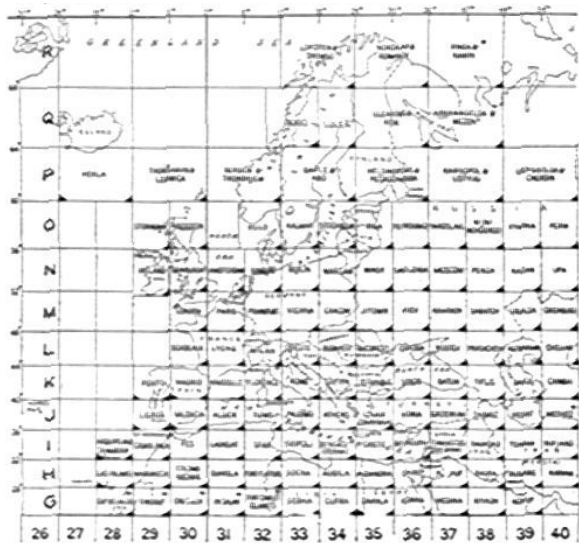
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some period. Their ignorant or warped minds usually lead them into ludicrous inconsistencies which quickly reveal their hollowness to a careful listener, but some of them are plausible enough to yield considerable possible benefit to the Axis. These are now countered by special broadcasts by most of the Allied countries, and by some "freedom" stations.

Mr. Ettlinger has done a capable job in outlining methods, propaganda lines and counter-lines, inconsistencies, personalities, and counter-measures. *The Axis on the Air* is readable—interesting and swift-moving. I recommend all of it, save some of the side issues dragged into Chapter 21 by this radio columnist of the *Chicago Sun*.

MILITARY CORRESPONDENCE AND REPORTS. By A. C. Howell. 179 pp.; index. McGraw-Hill Book Co. \$1.50.

Professor Howell of the English Department of the University of North Carolina conducted a course to acquaint students with the writing problems they would likely meet after induction. This book is an outgrowth of that work. Appendices contain nearly half the contents, and include a style manual, check lists of requirements and suggested layouts for civilian letters and for Navy correspondence, and a bibliography. Practice exercises are also included.

AMPHIBIOUS WARFARE AND COMBINED OPERATIONS. By Lord Keyes. 101 pages. The Macmillan Co. \$1.50.

This book is packed with as much action and excitement as the title implies. Lord Keyes participated in a great number of outstanding battles in the last war, and he writes as a veteran campaigner in bringing us this book. He tells of the heroic Commando raids and of the tragic Dardanelles campaign in the last war.

Fascinating and interesting, this book is indeed a credit to its author.
B. H. W.

THE DUKE. By Richard Aldington. 390 pp.; index; illustrated. The Viking Press. \$3.75.

For his debut as a biographer Richard Aldington (already well known as poet, novelist, and essayist) brings an account of the life and achievements of Arthur Wellesley, 1st Duke of Wellington. It is no superficial or debunking piece of work; neither is it tedious to read. Well balanced, it of course devotes considerable space to the Peninsular War and Napoleon's final conquest. At the same time we gain a good idea of Wellington's background; his early life in Ireland; his Indian service; and his political life, including his prime ministry in 1828 and acting as stop-gap for Peel in 1834.

It is refreshing to find facts clearly presented, properly set within history's framework. Battle and campaign descriptions undoubtedly profit from Mr. Aldington's military experience a quarter century ago. A good research job has been done. The narrative flows smoothly. And of course any military biography is "timely" today—especially one set against the Napoleonic period, with today's parallels of continent-wide despotism and invasion of the European mainland.

YANKEE LAWYER: The Autobiography of Ephraim Tutt. 451 pp.; index. Charles Scribner's Sons. \$3.50

In 1919 *The Saturday Evening Post* published *The Human Element*, the first of Arthur Train's many stories of the experiences of Lawyer Tutt. So "human" a man was Tutt that he became even better known and more beloved than was that fictional character, David Harum. As a result, tales based on his cases have been eagerly awaited and avidly read. Legally sound, they appealed as much to lawyers as to laymen.

Reared in New England, contemporary and friend of Coolidge 'though usually on the other side of the political fence, Harvard graduate, country lawyer, on Tammany's payroll for a time, private practitioner but not a "corporation lawyer," ever seeking "justice" as he saw it in his particular cases, keen fisherman, lover of nature including human nature—Ephraim Tutt has led the full life. He was a success in both country and city practice, and has taken time off in which to enjoy the more important offerings of life. Now he has reached the mellow period.

He jotted down his autobiography in attempt to set himself right, to straighten the record which he feels Mr. Train has distorted a bit too much. He gives his own "correct" version of a good many of the published stories, yet, comparing both accounts, it seems that most of them gave a pretty accurate picture of this fine man. Of course Arthur Train necessarily was a bit hit-or-miss in selecting episodes which would make good fiction. The autobiography gives a more rounded picture of the man, and recaptures much of the swing and "feel" of progress (or at least change) through the past sixty-odd years. In spots it even makes the reader recall some volumes of *Our Times*, by Mr. Tutt's old friend Mark Sullivan.

Through it all weaves one strong, consistent thread—a true soul's search for the meaning of life in its proper sense, his urge to make the law yield justice for those entangled in difficulties. One need be no lawyer to appreciate Mr. Tutt, or to follow his clients. Indeed, Ephraim Tutt has no respect for the merely technical, for formality-without-reason. Because of this some lawyers may deem him a charlatan. Actually, however, it is from honest, open, and inquiring minds like his that proper progress and growth develop, whether the field be that of the law or any other.

Mr. Train has previously collected into book form most of his stories about Tutt. Those, despite their somewhat arbitrary selection, told much about the man. It is splendid that in his autumn Mr. Tutt himself has taken time to recapture the spirit of his time, and to put into proper relation and perspective the many unconnected anecdotes.

P.S. It is well to be just a bit skeptical about Mr. Tutt's part in writing this book, and not to place too much emphasis on the "auto" in its subtitle. Train and Tutt have been so close for so many years and had such parallel careers that it is quite possible this is as much a biography of Arthur Train as of Ephraim Tutt.

MOMENT OF TRUTH. By Col. Charles Sweeny. 290 pp.; index; maps. Charles Scribner's Sons. \$2.75.

Col. Sweeny begins his *Moment of Truth* with a study and discussion of the German (or as it should be known, the Prussian) General Staff. He brings forward their history, their feudal, aristocratic life and thinking, and endeavors to show that since the middle of the 18th century the world has repeatedly suffered from a combination of the Prussian General Staff as a whole group rather than as individuals composing this group, and from the moral and nationalistic character of the German. He deals with Marshal Foch's insistence that the Prussian General Staff be abolished. This demand by the French marshal was in 1919 and, as the world knows, was ignored. This dissolution, insisted Foch, was one of the requisites if the world was to have lasting peace. It may be true that the General Staff is not wholly to blame, yet it presented a problem that, once given the means for continuation of battle, would be eager to resume its depredations upon civilization, like its Asiatic counterpart—the Samurai of Japan.

The author then discusses the Continent of Europe as the background against which the armies of the Axis operate. He names the three principal fortresses of Europe as the Iberian, the Central (France, Switzerland, Germany and Italy), and the one comprising the Bohemian and Carpathian Mountain chains.

Another important battleground is examined, one which Adolph Hitler said would eventually decide the fate of Europe—North Africa. It is worth noting that in 1925 Sweeny himself was on a mission through this territory to evaluate it as a base of operations for any forthcoming European war. Ludendorff predicted that the fate of Europe in any war would be determined by the outcome of battles to be waged there.

Next the author plunges into the controversial aspects of his book. He deals with the civilians and politicians who are charged or are charging themselves with the conduct of the war. He presents the professional viewpoint, for he sees the home front as an extension of the battlefield, and asserts, not without justice, that the war conduct of the home front is as interrelated to the battlefield as are the series of front-line trenches linking divisions of an army with each other.

A. E. G.

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THE WAR IN MAPS \$2.00
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RAND McNALLY'S "POCKET" MAPS

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*Oceania, 463; Australia, 240; New Zealand, 77.

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FOGS, CLOUDS, AND AVIATION. By W. J. Humphreys, 193 pp.; bibliography; index; photographs. The Williams & Wilkins Co. \$3.00.

In the past year a number of volumes on meteorology have justly become best sellers among the military service. These have mostly been on the general subject of weather as a whole, with some elements of its forecasting. It is fitting, therefore, to have more specialized books become available.

Fogs, Clouds, and Aviation is well described by its title. It combines a simple (though thoroughly scientific) explanation of the various phenomena with a most complete collection of cloud photographs, finely reproduced. Dr. Humphreys, formerly meteorological physicist with the U. S. Weather Bureau, goes beyond mere description, however, to note the significance of each type of fog and cloud—how thin, extensive, opaque, and high they are, whether they provide good or only fair concealing screens in one direction or more, what the icing danger is, etc. This latter material is of most value, of course, to the air forces, but it has its application to ground troops as well, particularly to liaison and observation plane sections.

THE NIGHT OF THE SUMMER SOLSTICE (and other stories of the Russian war). Selected and with a preface by Mark Van Doren. 245 pages. Henry Holt & Co. \$2.50.

Most of our knowledge of Russia's war comes from cold, impersonal communiques or extremely general articles translated from papers like *Red Star*. A good "feel" of the war has been lacking. We've heard little of small-unit episodes, little that gave a close view of the actions of guerrillas or of life in occupied communities.

Such stories have been written, though. Published in smaller-than-pocket-sized booklets, they have had wide circulation among Russians who are living the war. A considerable number have found their way, already translated into English, into this country. Twenty of them appear in this book.

Presumably these tales are true, or at least based on actual episodes. The latter is more likely. Well written, they are gripping tales that together carry a tremendous impact. They definitely throw the enormous struggle into a human focus.

OTHER BOOKS RECEIVED

GREAT SOLDIERS OF THE FIRST WORLD WAR. By Capt. H. A. DeWeerd. 206 pp. *Infantry Journal*. 25c.

Description of Allied and German leaders of World War I, originally published a couple of years ago.

THE MILITARY STENOGRAPHER. By Queena Hazelton. 133 pp. McGraw-Hill Book Co., Inc. \$1.00.

Handy compendium of pot-hooks, including court-martial terminology as well as general military terms.

GREECE AGAINST THE AXIS. By Lt. Col. Stanley Casson. 150 pp. *American Council on Public Affairs*. In cloth, \$2.50; in paper, \$2.00.

The Greek tragedy well and ably told by a Greek student and archaologist who knows his subject thoroughly.

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British Information Services: Cover, 886, 896, 897.

New York Times: 903, 904, 909, 910, 912.

5th Armd Div SSO: 914 (upper).

Armored Command Signal Photo: 917, 918, 919, 920.

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