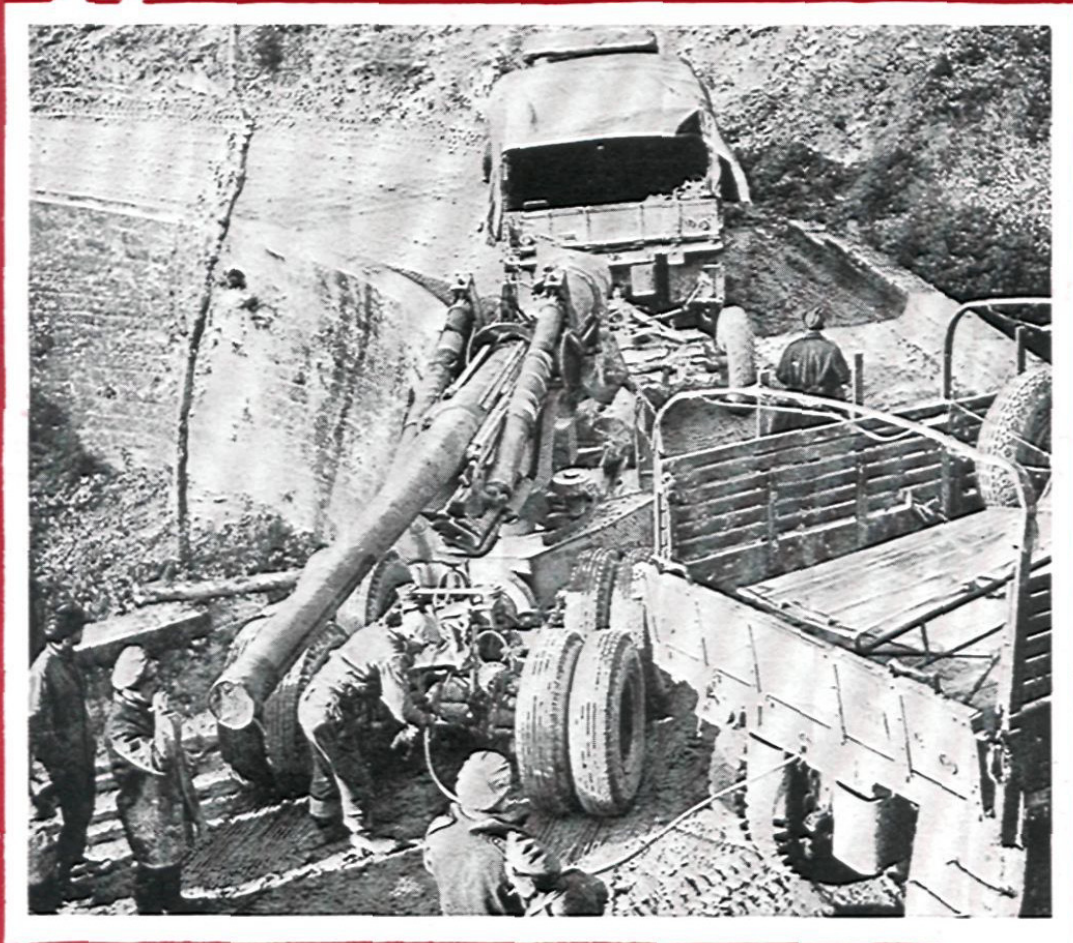


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A BOW to the officers of the 174th FA Bn! 21 more of them have just joined the Association *en masse*, restoring the unit's 100% membership status.

By checking this matter of membership as your personnel changes from time to time, you can make sure all your officers are keeping up to date. At the same time, remember to see that the batteries are getting enough copies for their men. Thanks!

A STRAIGHT LINE is the shortest distance between two points. But when a trailed load tries to follow that line instead of going around a hair-pin turn, the straight line is not the shortest in point of time. Our cover picture illustrates some of the difficulties encountered in Italian mountains. The piece, of course, is a 155-mm gun; the troops, British.

NEXT MONTH'S JOURNAL will continue the series of excellent combat accounts that have been steadily arriving, thanks to the interest of officers and men overseas. In fact, it will bring some of the finest we have seen anywhere. Of widespread interest too are detailed descriptions of the firing of propaganda shells, which has been done so effectively by the Fifth and Ninth Armies, among others.

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The Field Artillery Journal

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Leaders Must

Have initiative; drive to get things done; character and ability which will inspire confidence; moral courage; resolution; determination; high morale; ability to radiate confidence in the plan and operation.

★

Give instructions and orders with confidence.

★

Exercise their authority by their understanding of their men; their professional knowledge; strength of character; and innate superiority.

★

Make clear to non-commissioned officers and junior officers what is wanted.

★

Instill discipline—that subconscious obedience that is necessary to all military control. This involves doing with painstaking care all those things that should be done. This includes not only doing the many things a soldier should do but doing them carefully and well and never forgetting them no matter what happens—such things as habitually keeping weapons clean, retaining weapons and equipment during operations, inflating tires properly, not throwing food on the ground, etc.

★

Give constant unremitting attention to detail. This means giving a lot of one's self and time.

★

Have rigid control and vigorous personal leadership.

★

Supervise execution of orders—every commander, even a squad leader, must feel a definite sense of responsibility for this supervision.

★

Eliminate weaklings and misfits—be tough mentally as well as physically.

★

Have patience and good sense of humor.

★

Encourage humor when situation is tough.

★

Speed up thought and decision—learn to cut to the heart of a situation.

★

Stress sanitation—where there is improper sanitation there will be a resultant high non-effective rate and a lowered combat efficiency rate. Preventive measures and proper sanitation must be stressed.

★

Combat war neuroses. Competent leadership, adequate orientation and training, excellent discipline, and the best mental and physical fitness are essential to counterattack this condition. A soldier needs to know what is going on, what is expected of him, what he may expect to encounter, and must have a definite object or goal otherwise he is entirely unprepared when the unexpected or the unexplainable happens—this makes him a perfect set-up for a mental break.

★

Understand how important they are to their men. When the shooting starts, officers that simply have been tolerated by their men find themselves expected to know everything on every subject.

★

Always know the tactical situation and keep subordinates informed—allow time for all to understand the situation and orders.

★

Accept no alibis—be satisfied with nothing but results.

★

Realize, no matter how bad their own situation may be, there is always the possibility that that of the enemy is much worse.

★

Break down and overcome all difficulties standing between himself and the execution of his mission.

★

Be unperturbed by fluctuations of combat. Battle impressions tend to weaken the will of a commander and batter at his determination. He must resist these onslaughts and deliberately take an optimistic view.

★

Realize that unexpected obstacles, frictions, mistakes, obscurity, and confusion are common occurrences in battle—do not be upset and do not criticize or permit men to criticize higher authority when they occur.

★

Remember that it is better to make an error in judgment than to neglect opportunities or remain inactive.

★

Take calculated risks.

★

Instill men with the will to win—this is largely gained by physical fitness and proficiency and confidence in weapons.

★

Remember that in battle a leader may lessen tension by: Doing something himself that will give his men a feeling of security. Ordering men to do something that requires activity and attention.

★

Have a willingness to do anything at any time and instill such a spirit in all subordinates.

★

Keep a firm grip on fundamentals—the things that really matter.

★

Never belly-ache.

Naval Shore Fire Control Parties in the Southern France Landings

For planning the Southern France operation there was a large file of proposed plans, organizations, and miscellaneous ideas on Naval Shore Fire Control Parties, but none of these were followed up by a report pointing out either weaknesses or advantages of the prior-envisioned plan. Here is the consolidated report of the officers who actually led these observer parties through combat. It presents the plan and the result for comparison.

PLANNING PHASE

Initial planning for the Southern France landings anticipated the need for Naval Shore Fire Control Parties (hereinafter referred to as N.S.F.C.P.). Early in February, 1944, a preliminary survey of future needs of men and equipment was presented to the interested staff sections of Seventh Army. Based on this survey, the basic Signal project submitted to AFHQ included radio equipment for the parties.

Throughout the planning period there was considerable discussion as to which "fire control code" should be used. After the War and Navy Departments issued a joint statement directing that Naval spotting technique be used for the control of all naval gunfire, a board composed of Army, Navy, and Air Force officers began working on a compromise code which later developed into the "Mediterranean Bombardment Code."

On 24 Feb 44 a radiogram from NATOUSA G-1 to CG, Mediterranean Base Section, directed the attachment of 20 Field Artillery replacement officers in the grade of Lieutenant to the 85th Inf Div, then taking amphibious training at Invasion Training Center, Arzew, Algeria. This attachment had been requested by Seventh Army (then known as Force 163) so that those officers might be trained as naval gunfire observers and be the nucleus around which parties could be built. These 20 officers remained attached to the units going through Invasion Training Center and finally were attached directly to the Center. They moved from Arzew to Salerno, Italy, with Invasion Training Center, and the final part of their training, the drawing of equipment, and the formation and training of the parties were conducted there.



Highly effective fire is delivered during the landing by field artillery firing from LCTs. Britain's 25-pounder, with muzzle brake, is one of the weapons found highly suitable for such use.

Each officer fired 3 to 6 problems during this early training period, and a majority of them observed a bombardment from on board a firing ship, thus familiarizing them with naval fire control equipment and technique.

ORGANIZATION OF N.S.F.C.P.S

Organization of the parties generally followed that previously used in the Mediterranean Theater. However, each party was provided enough transportation to make it completely mobile, and complete duplication of all radio channels was provided by equipping each party with both audio and frequency modulated radio sets. Past experience had shown failures in radio communication to be the major factor in the breakdown of good fire support. Similarly, sufficient men were provided for the party so that one or two casualties would not cripple it.

The "spotter" section with the artillery officer is the eyes of the team, and the liaison section with the naval officer is the communication center. Therefore the T/O and E for the N.S.F.C.P. was written with a definite breakdown into two sections. A final table of organization and equipment was decided upon and was approved by the Theater Commander (see Table 1).

TRAINING

Plans in March called for the spotter and naval liaison officers to be trained for two months at Invasion Training Center, the equipment drawn and issued, and then the enlisted men assigned to the parties in time to give the group as a whole one full month of training. Due to the postponement of D-day and the temporary low priority of Seventh Army, however, neither enlisted men nor equipment was made available until the first of July. Thus the officers were in training four months, which was far too long as evidenced by lagging interest in May and June. It was fortunate that the Army and Navy officers underwent such a prolonged period of training, though, for each was able to organize and train his own party and quickly mold it into a team. If inexperienced officers, as



well as the enlisted men, had been assigned to the parties in July, the training task would have been impossible because there were only five qualified instructors in the theater.

The decision was made that Seventh Army would furnish five NSFPCs to each of the three assault divisions. Each division was to organize four additional parties, making a total of nine parties per division—one for each infantry battalion.

The divisions, replacement personnel, and equipment were all in Italy, so the parties were formed there. The Invasion Training Center at Salerno was given the task of organizing and training the parties, but a member of the Artillery Section, Seventh Army, was attached to ITC to supervise and direct the training. A tent camp was erected six miles south of Salerno and on 26 Jun 44 the enlisted personnel for the non-divisional parties was received from replacement centers. Three "batteries" were formed to handle the large group of men. Supplies and equipment began to arrive about 1 July and were immediately issued out to the parties for training.

A directive was received from A. C. of S., G-3, Seventh Army, to form three additional parties for the First Special Service Force which was to make a "sneak" landing in rubber boats before H-hour in France. Volunteers were called for and three excellent parties were quickly trained, equipped, and sent to the SSF for specialized training in rubber boat landings. No Naval liaison section was provided. The spotter parties received special radio equipment after they joined the Special Service Force, which lightened their loads considerably. These items were SCR-694 and SCR-619 radios, replacing the heavier and bulkier SCR-284 and SCR-609 radios.

The course of training at Salerno included map reading, naval gunnery, radio procedure, the use of Navy codes and ciphers, physical conditioning, and communication exercises. The Navy liaison officers and the fifteen trained artillery officers did the actual instruction.

A training program was scheduled, but could not be followed closely because of the drawing and issuing of equipment. Only a very small group of administrative overhead personnel was provided and it was necessary to take officers and men away from their training to assist in this work. By rotating these duties everyone lost an equal amount of training.

On 9 July the entire detachment of 30 parties moved to Camerota, Italy, on U. S. Navy LCIs. A small detachment of about 35 men moved down in vehicles with rations and some equipment. The next four days were spent in extensive service practices. Each party fired at least one problem—each man doing his regularly assigned job as he would at an OP. Division Air OPs were flown down from Paestum airfield and adjusted

naval gunfire very successfully. The entire group of parties returned to Salerno on 13 July. On 16 July the training camp was disbanded and all parties joined their divisions to participate in amphibious training and exercises.

COMMUNICATIONS

The communication plan for the control of naval gunfire was designed to be as simple as possible. The radio nets were kept independent of any existing Army or Navy channels by using frequencies assigned to follow-up units.

The Navy communication plan drew a clear-cut line between assault and post-assault communications. During the assault phase each party had at least one ship assigned to fire for it, naval liaison officers were to be with infantry commanders, and control was to be completely decentralized—speed of supporting fires was to be primary. The post-assault phase was to go into effect upon order of the Fire Support Group Commander (Navy), and at that time control was to be centralized to provide deliberate, prearranged fires. Naval liaison officers were to move to artillery fire direction centers, naval liaison officers with division artillery headquarters were to coordinate requests for fires with artillery missions, and ships were generally to be on several hours' call rather than continuously in the fire support areas. A naval liaison team with corps headquarters was to coordinate requests for ships.

Communications for the assault phase were:

- a. Each party to have an independent firing frequency on both FM and AM radios working directly to an assigned ship.

TABLE 1—NAVAL SHORE FIRE CONTROL PARTY

Unit	Technician Grade				Basis of Issue and Remarks
	Observer Section	Liaison Section	Total		
1 1st Lieutenant, FA	1				Observer.
2 Lieutenant (jg), USN		1			Naval Liaison Officer, furnished by Naval Commander concerned.
3 Total Commissioned	1	1	2		
4 Staff Sergeant (645)	1	1			Chief of Section and Observer's asst.
5 Radio Operator, Low Speed (776)	4	1	1	2	One per SCR-694 (or 284).
6 Radio Operator, Low Speed (776)	5	1	1	2	One per SCR-694 (or 284).
7 Radio Operator, Voice (177)	5	1	1	2	One per SCR-610 & SCR-619.
8 Wireman and Telephone Operator (641)	1	1	1	2	Also drive ¼-ton truck.
9 Total enlisted	5	4	9		
10 Aggregate	6	5	11		
11 O Binoculars, M-8	2		2		One for FA Officer, one for S/Sgt.
12 O Carbine, cal. .30	4	4	8		
13 O Pistol, automatic, cal. .45	2	1	3		One per Officer and S/Sgt.
14 O Trailer, ¼-ton		1	1		For radio spare parts chests.
15 O Truck, ¼-ton, 12 volt	1	1	2		One per SCR-694 (or 284).
16 S Radio Set, SCR-694 (or 284)	1	1	2		
17 S Radio Set, SCR-610		1	1		
18 S Radio Set, SCR-619	1		1		
19 S Reel, RL-39	1	1	2		
20 S Telephone, EE-8-B	1	1	2		
21 S Tool Equipment, TE-33	1	1	2		One per operator, telephone.
22 S Wire, W-130, miles	1	1	2		
23 Q Stove, vehicle, 1-burner	1	1	2		One per truck, ¼-ton.
24 O Compass, M-2	1	1	2		One for FA Officer, one for S/Sgt.

b. Each division to have a common bombardment channel on both FM and AM. These channels to be used for the exchange of information, requests for additional ships, and administrative instructions. The common FM channels were also used for Artillery Air OPs to allow them to adjust naval gunfire. Thus each FM radio had an A (firing) frequency and a B (common) frequency. Each AM radio had a primary frequency working directly to an assigned ship and an alternate frequency which was common. Each ship was equipped with an SCR-608 and listened on both FM channels and also monitored both AM frequencies.

Communications for the post-assault phase were:

a. There were to be two fire support groups, one on each sea flank, each group to have seven firing and one common channel on both AM and FM. All requests for fire support were to be sent on the common channel and the fire support group commander then to assign a firing channel when detailing a ship to do the shooting.

b. The corps liaison team was to communicate with both groups by using the two existing common channels. Daily requests for the following day's expected requirements were to be consolidated and forwarded by this corps liaison team.

OPERATIONS OF NSFCPS

Assault Phase

Morning of D-day (15 Aug 44) found the Shore Fire Control Parties landing with the assault infantry battalions. Some of the Artillery officers were offshore in control craft directing the pre-H-hour bombardment and reporting the advance of the

assault troops. These officers either rejoined their parties ashore or returned to their transports and landed with their men.

Few missions were fired by the NSFCPs. Resistance ashore was so scattered that heavy naval concentrations were unnecessary. The missions that were fired were all very successful, and in some instances it was reported that without the accurate gunfire support provided some units would have had much more difficulty in reaching their objectives.

The parties landed on various schedules and with different items of equipment. All parties landed initially with only SCR-609s, however, and their SCR-284s joined them later with the transportation. Communications followed the plan exactly, and were excellent.

Early on D-day the divisions moved inland beyond the range of Naval gunfire. The U. S. 3d Div was actively supported by gunfire during its advance west along the coast toward Toulon. Most of the fire, however, was deep supporting and was adjusted by aircraft or by the ships' own top observation rather than by shore fire control parties. NSFCPs were quickly converted to forward observer parties for the divisional artillery in the assault divisions, and by D+4 the Army NSFCPs were withdrawn from the divisions and held in reserve pending further amphibious operations or advances along the coast. The "Assault Phase" of the operation had passed quickly.

Post-Assault Phase

On 19 Aug 44 Seventh Army NSFCPs were attached to the First Airborne Task Force, which was given the Franco-Italian frontier as a sector of operations. Destroyers were assigned on standby missions and cruisers on call of the Naval Liaison Officer with the Task Force Artillery Officer. This attachment lasted until approximately the middle of October, when the units on the coast assumed responsibility for directing the very limited naval support.

During the post-assault phase communications functioned as planned. The distance from the west to the east flank was so great that the Corps Naval liaison team was unable to contact both fire support areas, so control was decentralized and each fire support group operated independently. Information and administrative messages were all sent on the common frequencies. This defeated the purpose of the common calling frequency by overcrowding it with non-tactical messages.

On 25 Aug 3 Army parties were attached to the 9^e Division Infanterie Coloniale attacking Toulon, and 4 parties to the 3^e Division Infanterie Marocaine attacking Marseilles. British Artillery forward observer teams

TABLE 2—RECOMMENDED NAVAL SHORE FIRE CONTROL PARTY

Unit	Technician Grade				Basis of Issue and Remarks
	Observer Section	Liaison Section	Total		
1 1st Lieutenant, FA		1			Observer.
2 Lieutenant (jg) USN			1		Naval Liaison Officer, furnished by Naval Commander concerned.
3 Total Commissioned		1	1	2	
4 Staff Sergeant (645)		1		1	Chief of Section and asst. observer.
5 Radio Operator, Voice (177)	4	1		1	Operates SCR-610.
6 Radio Operator, Low Speed (776)	4		1	1	Operates SCR-694.
7 Radio Operator, Low Speed (776)	5		1	1	Operates SCR-694.
8 Radio Operator, Voice (177)	5	1		2	Operates SCR-610.
9 Driver (345)		1	1	2	Also trained as wireman.
Total enlisted		4	4	8	
10 Aggregate		5	5	10	
11 O Binoculars, M-8		2		2	One for FA Officer, one for S/Sgt.
12 O Carbine, cal. .30 M-1		3	4	7	
13 O Compass, M-2		2			One for FA Officer, one for S/Sgt.
14 O Pistol, automatic, cal. .45		2	1	3	One per Officer, one for S/Sgt.
15 O Trailer, ¼-ton		1	1	2	For radio spare parts chests.
16 O Truck, ¼-ton		1	1	2	
17 S Radio Set, SCR-694				1	1
18 S Radio Set, SCR-610		1	1	2	
19 S Reel, RL-39		1	1	2	
20 S Telephone EE-8-B		1	1	2	
21 S Tool Equipment, TE-33		1	1	2	One per telephone, EE-8-B.
22 S Wire, W-130, Miles		1	1	2	
23 Q Stove, vehicle, 1 burner		1	1	2	One per truck, ¼-ton.



When we published the picture at upper left on page 708 of last October's issue, we suggested that old tank turrets embedded in concrete could readily be used for defense inside cities. Shortly afterward we encountered the photo above, taken in Marseilles late in August. This turret commanded the main street along the harbor. Original caption says "the street below is a network of tunnels from pillboxes to Fort St. Jean (rear)." Undoubtedly these "tunnels" were actually the city sewers, so that these turrets were really glorified manhole covers. The net effect, of course, is to give a series of stout, traversable, interconnected gun emplacements somewhat similar to the Maginot Line battery shown at left, but acquired much more cheaply!

were already directing the gunfire, but officers with FM radios were needed for liaison work. These parties had functioned only 24 hours when both cities surrendered.

All the Seventh Army NSFCPs were returned to the Army CP, and some of the officers and men were released to units as replacements. The remainder were used as the nucleus for the 575 FA Bn, a newly activated 8-inch gun battalion.

SUMMARY AND CONCLUSIONS

1. The NSFCPs with Seventh Army in Southern France did an excellent job of directing and controlling support gunfire.
2. The Mediterranean Bombardment Code was a satisfactory code for controlling naval gunfire.
3. Mobile NSFCPs are an advantage.
4. The SCR-609 is excellent for ship-to-shore communication.
5. It is advantageous for the parties ashore to be personally acquainted with the firing ship supporting them.
6. Observers offshore in control craft can definitely aid the control of pre-H-hour bombardment and can direct the support gunfire until NSFCPs can get ashore and into position to observe.
7. A Naval Officer with each Infantry battalion is not necessary. Liaison Officers with regimental headquarters initially would be sufficient. These officers could later move to Artillery Fire Direction Centers.
8. In specialized operations, such as that undertaken by the First Special Service Force, a Naval Liaison Officer must be provided for the controlling headquarters ashore.

RECOMMENDATIONS

Organization (Table 2)

1. The T/O be cut to 1 officer, 1 sergeant, 1 radio operator,

1 driver for the observer section. The parties as organized proved to be too large and cumbersome.

2. No change in the liaison section.
3. Drivers must be asked for by specification number in the T/O.

Equipment (Table 2)

1. The SCR-284 be deleted from the observer section T/E.
2. A ¼-ton trailer be added to observer section T/E.
3. An SCR-610 be substituted for the spotter's SCR-609.
4. No change in the naval liaison section T/E.

Training

1. Parties should be fully organized and equipped and ready to begin their training at least 60 days before D-day.
2. Parties should train with the fire control code to be used operationally.
3. Parties should be instilled with the probable accuracy of naval gunfire during training, not the possible inaccuracy. All naval gunfire support in the Southern France landing was extremely accurate, whereas the observers had been taught to expect very erratic firing. They had to gain confidence in naval gunfire in combat rather than during training.
4. Map reading and location of targets by coordinates must be stressed.

Tactical Use

1. NSFCPs should work in conjunction with the artillery forward observers and liaison officers.
2. There should be a liaison-information net as well as the common calling frequency. The common frequency was too often overcrowded with administrative and information messages and calls for fire could not get through.

AFTER THE LANDING

By Arty Bn Comdrs, 29th Inf Div

FOs AND LOS

Forward observers *should not* be habitually with the leading elements of the infantry. They should be in a position to observe or be free to move to obtain observation. If they are with the leading elements and are pinned down with the infantry, they cannot give the support when most needed.

It is essential that FOs and parties secure overhead cover as soon as possible, as a high percentage of their casualties have been from air bursts.

FOs should check in at the CP and FDC prior to going out and on their return. In this manner they can be briefed, and they can also give the FDC helpful information.

Strict compliance with "book procedure" for requested fire missions saves time and eliminates possibility of the mistakes often caused by unorthodox methods. Although all personnel have been well trained in the proper procedure, they sometimes seem to forget this in the heat of the battle. A thorough briefing of all LOs and FOs before going on their missions often helps to eliminate this tendency.

A forward observer's party should contain at least six enlisted men. Wire is a difficult thing to keep in when the enemy uses his mortars and artillery to any great extent—and if it is to be repaired quickly, you need the men on the spot to do the work.

Medium FOs should report to the Light Battalion LO of the sector of observation. They should have lines laid to all points of observation, and be available to go wherever the LO desires medium fire to be placed.

FOs should not disconnect telephones during the night hours for fear of disclosing positions: bells should be muffled and a listening watch maintained.

Forward observers should not be required to stay on outpost line unless suitable artillery targets are present on the front in their sectors. In this connection, greater cooperation and understanding is needed by the infantry small-unit commanders as to the function of the forward observer. FOs need not go forward of company CPs except for specific missions, at the completion of which they should withdraw to better cover and protection.

Targets must be evaluated. There has been a definite tendency at times to use artillery for targets which could have been more easily neutralized by infantry supporting weapons.

Forward observers habitually check in with liaison officers when reliefs are being effected, in order that all concerned can be thoroughly oriented as to the situation, targets, concentrations, etc. When a relief for a liaison officer arrives he should be thoroughly briefed before taking over.

Liaison officers should remember to request medium artillery when appropriate targets are presented on their fronts.

The liaison officer must act as an adviser to the infantry battalion commander—not be a "yes man."

When requesting fire, forward observers and liaison officers must take time to give full information as to nature of target, amount of fire needed, and whether for neutralization or destruction. Following the established procedure will save time in the long run.

In firing on hedgerows and sunken roads battery concentrations proved much more successful than battalion concentrations. They also saved considerable ammunition.

Houses have proven to be highly profitable targets as the Germans seem to occupy them constantly for CPs or strongpoints.

We have found it advisable to relieve our forward observers every 24 hours whenever possible. In an attack it is usually impossible to do this at all times, but by following this procedure we find that our officers and men stand up to the situation much better both physically and mentally. At least two complete parties should be organized in each firing battery to take care of this relief arrangement.

COMMUNICATIONS

Wire communications must be carried forward with frequent line tests. W-110 wire should be used. A wire laying crew from the batteries should supplement the FO parties in laying and maintaining wire.

Linemen have learned the value of policing wire as it is laid. They have also learned the points of possible breaks in the line by enemy shell fire, thus speeding repair. Much time can be saved in repairing a line if a repair crew moves to a point along the line which has been recently shelled (shelling is the most usual cause of broken lines).

When tanks are operating, wire must be well dug in or raised high enough to clear the radio antenna parts or the tanks will break the wire. Overhead crossing of wire at road junctions, etc., should be at least 20 high to allow antennae on tracked vehicles to pass under it.

Wire lines for telephone and remote control radio should be laid on different routes (or on the same route at least 20 yds. apart) if the area is subjected to enemy shelling. Enemy mortar fire has proven disastrous to communications of FOs.

We found in a number of our locations that it was necessary to establish a forward-relay radio set due to the distance of the front line from our positions. An SCR-608 has been used satisfactorily for this purpose.

Line route maps on a large scale map should be available for study by all wire men. Map reading should be stressed for wire crews.

Conduct extensive training in operation of two and three BD-72 switchboards hooked in parallel.

Medium battalions should lay trunk lines to the light battalions. This lets light FOs adjust the mediums without tying up the DivArty lines.

Lateral wire between adjacent light battalions often assists in clearing missions close to regimental boundaries and in getting information.

Extension of simplex line from FDC through Exec post to one of the gun sections is advantageous for emergency use in case the Exec post is shelled.

A forward switchboard is an absolute necessity. The board can be placed near the infantry regimental CP. Liaison officers and forward observers can tie into this board and run forward to their positions. Trouble-shooting crews should be kept

alerted in the vicinity of the forward switchboard, to be sent out as soon as a line is broken.

Covers for switchboards would prove a valuable protection for this vital piece of equipment.

Strict adherence to radio procedure must be maintained continuously. In the excitement of battle most men completely disregard proper procedure and merely add to the confusion.

The SCR-536 has been of great value to liaison and FO parties for rapid communications among themselves and between the various infantry elements.

AM sets, even though traffic is light, should be tuned or zero-heated at least twice daily.

On frequencies where confusion could occur through overcrowding of channels, 3-letter call signs should be used. Do not make call signs too brief. A standard system of affixing suffix numbers to different stations within a net should be practiced.

Additional mounting facilities for both AM and FM sets should be installed in as many alternate vehicles as are available.

Improvise a wire tagging code or symbol which is easily identifiable night or day.

FIRE DIRECTION CENTER

It has been found advantageous to have one man in the FDC to keep a record of all missions fired, with a running record of ammunition expended and on hand.

An angle of site chart for the VCO has been found helpful. This chart (in meters) includes the comp site.

As target designation is usually by coordinates, it is essential that all artillerymen be able to read maps quickly and accurately.

When using remote control, sufficient time must be allowed for remote control operator to push the button.

Computers must be three deep for continuous 24-hour operation. When time is available they should pass on to the gun crews all information as to type of target, effect of fire, and conditions under which a target was fired upon. This tends to speed up the gun crews and supplies them with information needed to make their jobs seem more important.

RECONNAISSANCE AND SURVEY

Artillery reconnaissance parties going into strange territory



Field artillery succors our infantry as well as supports them. Late in October part of an infantry battalion was cut off by Germans in the Belmont sector of France. D ration chocolate bars and bottles of halazone pills were packed into 105-how shells and fired to them. During the six days of isolation this was their only food other than what they chanced to have on them when cut off.

should have a security group as part of the party. For this we have used satisfactorily a wire truck with seven or eight men.

Do not use for close reconnaissance of enemy areas vehicles loaded with important CP equipment: this may result in loss of a vehicle with the more serious loss of necessary CP equipment.

The survey party is with the reconnaissance group, and immediately starts its survey beginning with the center battery. In most cases the survey and registration are completed before the arrival of the battalion. The batteries can then go into position and lay on a base angle; the battalion FDC has all corrections, etc., and is ready for mass fire.

AMMUNITION

While ample projectiles are on hand with the basic load, the breakdown of green and white bag powder offers difficulties at times. On two different occasions we found ourselves down to a very few rounds of the required type of powder while still having a unit of fire of shell and the other type of powder at the positions. This condition was brought about by the ammo trains' hauling the same type as has been expended. During the period the train was getting a resupply (five or six hours) of the type shell and powder we were firing, our supply of that particular type powder was almost exhausted. This condition would be alleviated if at least some battalions carried a charge of both white and green bag powder for each projectile in the basic load.

Time fire has been found to be far more effective than percussion against enemy personnel.

The M-67 fuze has been used with good results on observed fires, as well as on transfers after a time registration has been made. Cannoneers must be very careful in setting the time and should be exact in the setting. If in cutting the fuze the desired setting is passed, the fuze should be turned back to zero and reset.

POSITIONS—DISPLACEMENT

Position areas should be echeloned and dispersed. Vehicles within each area should be well dispersed. We were shelled extensively in one area—yet received no vehicle casualties and only one personnel casualty.

When the battalion is to displace, the base piece of the center battery is pulled out ahead and is registered prior to the battalion's displacement.



Displacement of a headquarters battery is made more quickly and easily by displacing by section or vehicle. Anticipate the new location and set up forward switching central.

ATTACHED AND SUPPORTING UNITS

In the case of corps battalions (subject to attachment and relief on short notice) it is necessary to maintain a regular though informal contact with several headquarters. During the period just prior to and after attachment, considerable attention must be directed to obtaining information and instructions. The best solution is to "catch one hand" the day before attachment and "let go the other hand" the day after.

It has been necessary to keep an up-to-the-minute track of all supported units. This has been especially true at night, when patrols have been sent out and harassing fires have been requested. The S-2 information can be applied directly to the firing chart in order to maintain reasonable safety lines, even though fire may be observed. Direct contact with FOs or visits by staff officers to the front lines are the only sure means of obtaining accurate information.

DELIVERY OF FIRE

Artillery preparations are not practical in Normandy-type terrain. The enemy merely get down into their foxholes and wait until the preparation is over. It amounts to a signal to the enemy that an attack is coming. A better plan is to withhold all preparation and to execute fires on call when proper.

Oblique photos taken from Cub planes and marked with concentration numbers on hedgerow intersections and other critical points have been most useful to both the artillery and infantry.

Too much stress cannot be placed upon the indoctrination of artillery officers with the proper procedure in conduct of fire. We have found that in the heat of battle observers are prone to forget the elementary principles they knew so well in garrison. Procedure *must* be automatic regardless of time, place, or circumstances. It must be second nature.

PROTECTION

The artilleryman is not immune to the enemy rifle, machine gun, or machine pistol. He must be prepared at all times to use his small arms while on reconnaissance, movement on the road, and while in his position.

Individual holes dug in the side of a hedgerow with a dirt overhang have proved fatal in a number of instances when the soil was loose and caved in due to enemy shelling.

In mobile situations guns must be dug in so as to be able to cover a front of at least 2000^{ft}. Ammunition and powder pits must be dug at all gun positions. Trenches with overhead cover must be dug for the cannoneers at the gun positions. Pits should be dug before occupation of position, if possible.

AIR OP

It was found necessary for the ground crews to carry and use demolitions in blowing down trees, and also crosscut saws for eliminating heavy brush. The assistance of the engineers in removing hedgerows and leveling terrain was required to a much greater extent than originally contemplated.

The procurement of supplies operated more smoothly and rapidly than anticipated.

Although prior to combat the practice was initiated of briefing pilots and observers prior to a mission, little stress was placed upon the link between the air crew and headquarters concerned.

This was accomplished by having the three officer pilots assigned to DivArty Air OP Section function as briefing and interrogating officers. Working in shifts, each officer briefed and interviewed the air crews and transmitted the information to both the DivArty S-2 and the Division G-2. When necessary, the G-2 or S-2 interviewed the observer personally.

Instead of maintaining 500 feet as a maximum altitude, it became the minimum height to avoid snipers and other small arms fire. 1,500 feet was the most favorable altitude for observation. While on the front, continuous changes of direction and altitude were necessary to evade 88-mm fire. Contour flying was a standing order when leaving and approaching the field. Remaining approximately 1,000 yards behind the outpost line was found the cure for holes in the aircraft upon completion of a mission.

Radio communication proved more reliable than anticipated. The 608 set of the DivArty Air OP Section was used as an aircraft warning and directing set.

ANTITANK AND TANK DESTROYER

Due to hedgerows fields of fire are often definitely limited and must, in many instances, be man-made. This can be done by cutting brush and clearing hedgerows. Mine platoons and engineers should be employed in the clearance of hedgerows by blowing. Antitank units should be issued brush hooks to clear fields of fire.

When the situation permits, positions should be prepared prior to their occupation and guns manhandled to positions. None should be held in reserve, as when needed it is impossible to find fields of fire unless these have been previously prepared.

57-mm guns should be sited so as to be self-supporting. They should be employed so they can get flanking fire whenever possible.

Due to limited observation, all guns of a platoon should be connected by wire and all platoons connected to the regimental antitank officer. Where feasible this should be supplemented by radio. Otherwise, a gun can be ambushed or knocked out and the fact not known to the AT officer.

Due to limited fields of fire, bazooka teams should be placed well forward and to the flanks in order to give early warning of the approach of tanks and be prepared to take tanks under fire prior to the employment of the antitank guns.

Positions should be well dug in and sandbagged to protect the crew from mortar and artillery concentrations.

Ammunition should be habitually buried.

Due to the terrain it has been found impossible to use towed TD battalions in mass. The Germans have not employed tanks in mass; usually four or five tanks are employed, accompanied by a company of infantry. For this reason tank destroyers must be emplaced near the front line in order to be in range of the tanks which follow the infantry.

If one company is kept in reserve, previously selected and reconnoitered positions must be prepared in advance and fields of fire cleared.

Antitank guns and TD guns must be given infantry protection or the positions will be overrun by enemy infantry.

It is recommended that pistols issued the antitank crews be replaced with carbines and each section be furnished one BAR for local security.

Every AT gun should be able to fire on enemy personnel with HE.

COMMENTS AND CONCLUSIONS

The need for considerably more training of OP personnel has been apparent. A method or system of maintaining surveillance and recording activities observed is necessary. When observing at ranges of 5-10,000 meters it is most difficult to tie the terrain for polar plotting of key points by BC 'scope and range finder, profile strips, and photo studies—all of which are essential in developing observation. The results can best be shown on the old but proven panoramic sketch with coordinates, azimuths, and ranges noted. This is the only way that a relief detail can be utilized to observe efficiently or to continue the development of the OP.

The number of people and movement at OPs should be kept at a minimum.

Increase in the present allowance of pioneer tools is needed for digging in all installations.

Each section should carry as part of its equipment a muzzle blast mat.

Trail logs have been used to a good advantage and were placed for all positions of the trails so that in big shifts it was necessary to move only the trails.

Regular issue OD paint has been found satisfactory in painting the tubes of 155 M-1 howitzers to eliminate the shine of the bare metal. This paint dries very rapidly and does not require placing the gun out of action. It is necessary, however, to touch up or repaint the tubes after the gun has fired a thousand rounds.

Latrines should be dug as deep as possible to avoid digging so many. This makes it less difficult for units moving in behind to get latrine space as the front line moves forward.

Excess powder from guns should be burned in latrines to kill fly larvae. The same is true of sump pits. They should be dug as deep and as large as possible. Trash burned in them helps dry them out and avoids unnecessary digging as they fill up more slowly this way.

The present vehicles authorized for a light battalion are sufficient and suitable for efficient continuous operations. Mechanically, they are superior. In many weeks of operations we had no mechanical failures so serious as to interfere with the operational use of vehicles.

PLANNING THE ARTILLERY ATTACK ON A FORTIFIED AREA

By Maj. George W. Landis, FA

Whoever today reads the newspapers or listens to the radio is familiar with the terms "Siegfried Line" and "West Wall." Almost daily we read that this line has been cracked as though it were in the nature of a wall such as surrounded medieval cities. Yet, notwithstanding the tremendous numbers of men landed in Europe and the untold quantity of modern weapons gathered, we have learned only too well that we face a formidable job in reducing not a single wall but a whole fortified area, and our penetration to date of writing can be measured in yards and feet and even inches.

In preparing for her great attack on Western Europe Germany built a system of permanent fortifications, not primarily as a defense but in order to launch her blitzkrieg. From these the present war started and to them, after five years, the war has returned. The line of battle on both the west and the east and to a lesser degree in the south is now marked by fortifications of one sort or another.

To prepare an attack on an organized position, it is always wise to understand as fully as possible the nature of the target. The Westwall is a fortified zone about 400 miles long and from 8 to 20 miles in depth. Here we have thousands of strong points or fortified areas organized along natural terrain features. The Germans have displayed extraordinary talent in utilizing the terrain to strengthen their defensive positions. To get into Germany and bring the European war to a successful conclusion requires a breakthrough of these fortifications. In the accomplishment of such a breakthrough as this we are convinced that the lives of many infantrymen will be saved by the careful planning for the coordination of fires.

Before we can attack, definite location of all installations in the fortified area is necessary. These installations will consist of

pillboxes, entrenchments, casements, and individual foxholes placed in folds of the ground. The Germans naturally occupy terrain favorable to them. All installations are so spaced as to permit interlocking fields of fire. Some of these fortifications are located individually, others are much closer together with connecting trenches and mutual support.

All the resources of Intelligence are utilized to permit the location of enemy targets. Air photos of the area are studied by the Army, Corps, Division, and our own S-2, who locate all discernible points.

From the infantry come reports of firing, resistance met, and observation. They report positions of pillboxes, machine guns, and other types of fortifications. It is most essential that when the infantry report, they give us accurate information as to the types of firing as well as the source of fire; and these must be marked on photos or sighted in with tape so that they can be shown our survey crews.

The artillery observers search the terrain for likely points of installation. From the study of photos, terrain, and reports of firing, we conclude where there are probable installations in a vicinity. To locate these definitely we must depend on reconnaissance in force or ask the infantry to send out patrols. It is again absolutely essential that as many enemy strong points as possible be located, for the infantry assault waves will be subjected to the fire of those we do not know about.

After locating targets on photos and on the ground, we must then accurately survey them in so that we may begin operations with a complete survey chart of our target and position area. This is slow and deliberate work.

Once we have definitely located the positions, we must determine just how we are going to destroy them—what direct and indirect fire weapons will be used to force a breakthrough.

Several factors govern the decisions in this matter. First, what do we have available? What guns do we have within the Division or the Corps and even the Army to support the attack? The primary weapons that we would consider are the 60- and 81-mm mortars and the 57-mm antitank guns of the infantry. Then there are the 3-inch and the 76-mm weapons belonging to the tank destroyers. And as larger weapons the 90-mm antiaircraft and 155 guns, in addition to the organic division artillery. Some of these, you will notice, are high velocity, flat trajectory weapons which we will use for direct fire on the embrasures of concrete structures, as our low velocity weapons have very little penetrating power. The low velocity weapons will be used for counterbattery and antipersonnel fire.

Now we consider what fortifications we are to destroy. How many? How strong? What type of construction? Some will be dirt shelters that can be knocked out by howitzers. Others are of concrete reinforced by steel, with walls many feet thick. The only vulnerable points here are the embrasures. It is for this reason we depend on the high velocity weapon which has very little dispersion.

The next factor to be considered is the position available, a position where we can get cover for our own guns to do their firing and be able to hit the target. Due to the fact the enemy employs a field of cross fire, we must get off the flank to score an effective hit. We must likewise consider the route(s) of approach and withdrawal, for these will determine the size of weapon we can get into position. The route of approach must be screened as much as possible and must be covered with firing during the occupation so the sound of approach will not give away to the enemy what we are doing. Our direct fire weapons will be along with the front-line troops, only from 600 to 1,000 yards away from their target.

After we have decided what weapons are to be used and what targets are to be fired upon, we must determine the amount of ammunition that will be needed. We must fully understand the type of target, and in addition must consider the length of time we can fire. Regardless of the fact that we plan counterbattery fire, we will get enemy artillery fire within three to five minutes of the time our own direct fire weapons begin to fire.

Once these factors are considered and a decision is made, we then survey in the location of each of our direct fire weapons, putting in orienting lines and determining the site, range, and direction to all targets. This information is prepared on a data

card and given to the weapon's commander. The reasons for this



When Cherbourg was shelled, observers from the 4th, 9th, and 79th Divs and from the battleships occupied this common OP.

you can readily see. Registration cannot be accomplished once these weapons start firing. Time then is short. The guns must be laid accurately so that very little adjustment will be necessary for fire to be completely effective.

The enemy will try to minimize the effectiveness of our fire by obscuring the target with smoke. We, on the other hand, to protect our gun crews will smoke their points of observation. This will make ground observation practically impossible.

Here the Cub plane proves of inestimable value. Our observers, being above the smoke, will be able to adjust. Due to the flat trajectory of the weapons, our observers will be instructed to adjust the trajectory vertically in feet instead of ranges in hundreds of yards. This brings up the point of how we are to aim the direct fire weapons and how to correct for deflection. The obvious thing is the aiming point or aiming stake, but because of the smoke it must be close to the gun and we must be able to correct both vertically and horizontally off the aiming stake.

One method is to have a sliding target on an aiming stake and make the correction by moving the target. Another is a "T" aiming stake with stripes of known width painted on both the pole and crossarm. These stripes will be of a width for which the mil relation will work at a known distance. This latter method facilitates the movement of gun for both direction and range.

SCHEDULE OF REGISTRATION AND FIRES

Unit	Time	Conc #	Coord.	Alt Yds	No.Rds	Type	Method of Fire	Remarks
"C" 745	1015-1020	815	984.421-863.101	76	15	Perc	Center Rn	
546	1015-1025	819	985.245-860.683	73	16	Perc	Center Rn	
546	1027-1035	820	986.128-861.108	81	12	Perc	Center Rn	
724	1015-1020	816	984.348-863.274	72	12	Perc	Center Rn	1 Btry Conc
724	1025-1035	818	985.508-861.038	84	18	Perc	Center Rn	1 Btry Conc
724	1015-1024	810	985.932-861.446	106	20	Smoke	Obsv Scr	Screen OP 6
724	1025-1035	811	985.609-860.609	96	20	Smoke	Obsv Scr	Screen OP 7
724	1015-1045	821	985.111-881.040	79	?	Perc	Center Rn	Save 24 rds
881	1020-1022	804	984.622-863.146	78	24	Perc	1 c apart	
881	1024-1026	815	984.421-863.101	76	24	Perc	1 c apart	
881	1035-1045	813	985.509-861.752	91	?	Perc	1 c apart	Save 24 rds M 48 A
880	1020-1030	802	984.944-863.053	88	72	Ti & Perc	1 c apart	50% Time 50% Perc
880	1032-1045	812	985.737-861.540	100	?	Perc	Center Rn	Save 12 rds M 48 & 12 M54
879	1020-1045		Targets of opportunity to be designated at				DA OP	2 Btrys
879	1020-1045		Adj Smoke missions as directed at DA OP					1 Btry
"A" 546	1022-1025	815	984.421-863.101	76	12	Perc	DF as asgn	
All TD and AT Weapons	1022-1025						DF as asgn	

Each gun commander should be brought forward and shown the position for his weapon. If the guns are to be dug in, this must be accomplished at night so that the enemy will be unable to observe what is going on. Avenues of approach and of withdrawal must be shown to each gun commander.

Working with Corps counterbattery officer, counterbattery fires are prearranged in order to better protect the crews of direct fire weapons and infantry assault waves from enemy artillery fire. Indirect supporting fires are planned to pin down enemy personnel in trenches, in foxholes, and even in the open, to prevent them from firing on the crews of the direct fire weapons and to protect the assault parties in their attack.

Avenues of approach are selected in cooperation with the infantry commander so that prearranged fires may be planned for the assault squad. Mortar and machine gun fire is coordinated to pin down enemy personnel, to isolate individual pillboxes, and to prevent reinforcement. In planning for the obscuring of definite areas by smoke, all probable wind conditions must be taken into account.

The heavy artillery is tied in with the survey and plans of fire made for heavy artillery to knock the dirt off the emplacements so that the direct fire weapons may hit the concrete itself and complete the destruction. These pill-boxes are covered with many feet of dirt upon which direct fire weapons have little effect.

Observation between artillery battalions must be coordinated, and there must be adjustment and correction of the fires being delivered to pin down the enemy and better assist the assault waves in their final attacks. It is essential to coordinate on a definite time schedule all firing and the attack itself. (See type schedule on page 139.)

And last but far from least, defensive and counterattack fires must be prepared to hold the position for that inevitable counterattack which will be launched.

This, briefly, is the plan of activity that must be followed to carry out the attack on a fortified area. It is a plan that entails detailed preparation and close coordination of effort. But only in this way will objectives be attained with minimum losses.

A COMMUNICATIONS HEADACHE IN THE BREST CAMPAIGN

By Capt. Harry J. Mathews, Jr., FA

The beginning of the attack on Fortress Brest against heavy fortifications and a well dug-in enemy was normal in that the liaison and forward observation parties with the supported infantry moved out in accordance with previous battle experience SOP. It became necessary, however, to organize a task force on Le Conquer Peninsula with the mission of cleaning out large and well-defended gun emplacements which were approximately 12 miles distant, and on a compass of approximately 3200 mils from the location and direction of the main attack against Brest itself. This task force was comprised originally of Rangers and artillery, both truck-drawn and self-propelled.

At the start a forward switchboard was established, according to the battalion SOP, in the vicinity of the supported infantry regimental command post, for the convenience of liaison officers and forward observers. As a battery of this battalion was attached to the task force with the usual liaison officer and forward observers, another battalion forward switchboard had to be installed. Command liaison with the task force had to be established, which officer was responsible for all artillery—which consisted of one battery each of 155-mm howitzers, 240-mm howitzers, 105-mm howitzers, 8-inch guns, and 155-mm guns, one platoon of 4.2-inch chemical mortars, one battery of 75-mm self propelled, and one 155-mm self propelled gun.

The battery of our battalion assigned to the task force remained under battalion control, thus making it necessary to send a SCR 284 radio along with it to remain in communication with battalion as well as with DivArty. The remaining two batteries of the battalion were attached to the task force three days later with the secondary mission of supporting their own combat team infantry on the other front. A displacement was made in order to split the difference between the two missions. SCR 608s and SCR 610s had to be realigned to work together in order to obtain unified control and to weld newly formed liaison

and forward observation parties together, and at the same time to tie in with the forward observers and OP personnel of Corps Artillery units which had the same two missions as this battalion.

This light battalion had the responsibility to see that all of this was done, because it was one of their officers who was named as command liaison with the task force. Later, however, the battalion commander of the medium battalion came to the task force to represent DivArty, and in order to effect a better coordination a makeshift FDC was set up to work in conjunction with that of DivArty. During the period this battalion had as many as 26 SCR 610s working at the same time, 4 BD 72 switchboards (one at each of the forward switching centrals and two at battalion headquarters), 4 BD 71 switchboards (3 at the batteries and one with a liaison officer who ran a switchboard for his own forward observers). Eventually the task force completed its mission and our battalion returned to its original assignment. This necessitated a quick change back of all radio channels so that there be no lag in the attack.

This unusual situation taught us the meaning of the word "flexible," and that the unorthodox is the usual situation, necessitating initiative on the part of every individual. The following are a few of the problems that made up the "headache":

1. Over 150 miles of W-110 telephone wire were laid by this battalion alone in a comparatively stable situation, making the need for additional wire always a problem. As an additional note it was necessary to reclaim all of this wire before the next operation; working under ideal conditions it took us four days to accomplish this.

2. The number of switchboards in use and the casualties suffered by the wire crews made it difficult to police and maintain the wire nets.

3. All radios within the battalion were in use the vast majority of the time, and when a set was knocked out or broken it was necessary to wait for a replacement before satisfactory

operating conditions were reestablished.

4. Radios had to be set up as relay stations from liaisons and forward observers on both fronts. At times when atmospheric conditions caused difficulties, even the SCR 608, of which this battalion had three, did not have sufficient range for satisfactory communication.

5. Communication with various units of Corps Artillery was difficult, as only single batteries were employed and radios were being used on the same channels with missions from both fronts. Direct wire lines to the task force were out of the question due to the huge distances involved, and before completing an urgent call it was usually necessary to go through at least three or four

distant switchboards. As a result conversations had to be relayed by the switchboard operator.

6. Due to a barrier line set up by higher authority, Service Battery was out of SCR 610 range due to distance, and wire was prohibitive due to the distance involved. Service Battery could profitably use a SCR 284 for its own use primarily; it could then be used as a supplement for the battalion in an extended situation.

7. The battalion's SCR 193 was sent out with a mechanized reconnaissance unit of the task force, thus cutting the battalion out of the Corps Artillery net which posts vital intelligence information.

COMMUNICATIONS IN THE FDC

By Pfc. Raymond Tracht, FA

The importance of communication, facility with which it can be handled, and the means of rapid and efficient installation during displacement cannot be stressed too strongly. This is especially true in the Fire Direction Center. After the first few weeks in combat the FDC of this battalion devised the system described here, which has greatly increased our efficiency during displacements.

All field artillerymen are well acquainted with the difficulties and confusion of the simultaneous installations of the many phones required in the FDC. The difficulties encountered in a daylight displacement are greatly increased during night operations. In a direct support battalion it is felt that better control and supervision, as well as more speed and efficiency, are gained by having S-3, HCO, VCO, and computers all housed within one tent. This system is predicated upon those conditions. We have been able to reduce to a matter of minutes the complete installation of the FDC after displacement, including not only telephones but remote controls to the battery base sets and the 608 located in the battalion CP. Milling about and confusion between radio operators and wiremen have been eliminated. The system is simple and efficient and combines the best features of a switchboard while doing away with the necessity of an operator. Transportation of communications equipment is among other items that are simplified.

Twelve phones are placed side by side in a carrying rack made of wood as per diagram, including the 3 simplex phones to each firing battery, 2 metallic lines to the battalion switchboard, 4 remote control phones (3 to the battery base sets in communication with FOs and one to the 608 radio), a direct line to DivArty FDC, a direct line to the Cannon Co for use when acting as an FA battery, and one additional phone to any reinforcing or supporting artillery unit, as the case may be. The telephones are secured to the carrying rack. During displacement it is transported as a unit. Upon arrival in the new position the case is placed on the computers' table directly in front of the three computers. Attached to each of the 6 phones which are



most used is a small bulb that lights when the phone rings, thereby simplifying the identification of the incoming call. Wires from the 12 phones run through a 12-circuit cable of short length to the outside of the Fire Direction tent and are attached there to a terminal strip. A 5-pair cable runs from the terminal strip to the battalion switchboard, linking the 3 simplex phones and the 2 metallic circuits. Radio operators attach their own remote control wires to the terminal strip—habitually using, of course, the same terminal.

Two additional modifications have been recently installed. (1) Two plugs from a head-and-chest-set are wired together and used to bridge any two phones so that anyone on any phone calling from any place to FDC can immediately be put in communication by radio or wire with any observer on what is tantamount to a private line. (2) Another improvement that expedites missions and is therefore worthy of mention, is the attachment of a loud speaker to the 608 radio. This enables all Fire Direction personnel to hear calls for fire missions, particularly those originating with liaison officers. By the time the message has been "rogered" for by the Fire Direction officer, VCO and HCO have plotted the target and data are on the way to the computers. It might be added that this latest refinement has enabled all personnel to hear the progress of the missions and the resulting effect upon the targets.

This article is too brief to describe in greater detail the further ramifications of the system, but it grew somewhat like "Topsy" in a battalion which found itself on D-day on the Normandy beaches without guns or equipment of any kind.

Are you devoting as much thought to locating targets as you are to attacking targets?

When watching firing demonstrations don't forget to look at the gun positions as the weapons fire, with a view to learning how to locate targets.



F . A . S . EVENTS

COURSES AND DEVELOPMENTS

The 623d Field Artillery Observation Battalion was activated at Fort Sill last month and assigned to the 31st Field Artillery Brigade as school troops.

Lt. Col. Herbert F. Layle, a former member of the staff and faculty, Field Artillery School, department of gunnery, and a graduate of field officers' course No. 5, was assigned as commanding officer of the new unit.

Staff officers of the 623d are familiar to Fort Sill personnel. Maj. William W. Hill, Jr., executive officer, was an instructor in the gunnery and combined arms and attended sound and flash course No. 8. Maj. Robert O. Schaeffer was also a student in sound and flash course No. 8 and was in the gunnery and tactics departments at the school; he is S-3 for the battalion. Capt. Edwin L. Dean, S-4, was with the departments of tactics, gunnery, and combined arms, and attended officers' survey course No. 52.

* * *

Field artillery liaison pilots are now taking primary training at Sheppard Field, Texas, under the supervision of the army air corps. The first class of primary students began the 14-week course at Sheppard Field last month instead of at Pittsburg, Kan., or Denton, Tex. The schools at Pittsburg and Denton were under civilian contract. The course at Sheppard Field is the first in which the air corps has had supervision of the primary training of the famous field artillery liaison flyers. Advanced training courses, which also run for 14 weeks, will continue to be held at the Field Artillery School.

More than 40 lieutenants and flight officers from Sheppard Field observed training and firing technique at the Field Artillery School to become familiar with field artillery methods. Refresher courses in flying liaison planes were also given to the instructors.

For the most part, flight officers will do the instructing at Sheppard Field. Practically all of the flight officers were formerly civilian instructors, each with more than 2,000 hours in the air. Recently they were appointed as officers in the air corps.

Officers of field artillery, upon completion of their primary liaison pilot course at Sheppard Field, will return to Fort Sill for advanced training in the department of air training under the direction of Lt. Col. Gordon J. Wolf.

* * *

The officers' motor course and enlisted motor course of the department of motors, Field Artillery School, have been reorganized to comply with directives standardizing motor courses at all service schools.

The courses extend over a period of 12 weeks. Graduates are qualified as motor officers or, if enlisted men, as motor sergeants

or motor mechanics. Instruction is given on all types of vehicles used in field artillery. Subjects covered include the construction, operation and adjustment of engines, fuel systems, electrical systems, and trouble shooting, also the power transmission systems, steering, brakes, and lubrication.

There are classes on driver training, field expedients, movement by rail, and maintenance under combat conditions. Emphasis is placed on practical work giving students training necessary for field operations.

Reorganization of the courses was completed under the direction of Col. Herman J. Crigger, director of the department of motors, and Maj. Ellis L. Jacobson, assistant director, in charge of the wheeled vehicle section.

JANUARY PERSONNEL CHANGES

Arrivals

Name	Present Duty
Lt. Col. Omar G. Olds	Asst. S-1
Lt. Col. John E. Slaughter	Dept. of Gunnery
Maj. William M. Leaverton	Dept. of Communications
Maj. Charles W. Mooney	Dept. of Combined Arms
Maj. Clarence F. Roberts	S-1 Section
Maj. John F. Stein	Dept. of Combined Arms
Capt. Jack Harding	
Capt. Ralph S. Heath	Dept. of Combined Arms
Capt. Leslie J. Klotz, Jr.	Department of Communications
Capt. David R. Lyon	
Capt. Davis P. Stovall	Dept. of Combined Arms
1st Lt. Hensley D. Clayton	
1st Lt. John M. Davis	Dept. of Motors
1st Lt. Walter W. Jones	
1st Lt. Schubert I. Luke	Dept. of Air Training
1st Lt. Albert W. Merck	Dept. of Materiel
1st Lt. Jesse L. Vaughn	Dept. of Air Training
1st Lt. Wilford S. Thomas	Aide-de-camp
2nd Lt. John K. Curran	Dept. of Communications
2nd Lt. Everett C. Smith	Dept. of Combined Arms

Departures

Name	New Duty
Lt. Col. Lester L. Boggs	Retired
Lt. Col. Herbert F. Layle	623d FA Obsn Bn, Ft. Sill
Maj. William W. Hill, Jr.	623d FA Obsn Bn, Ft. Sill
Maj. Robert O. Schaeffer	623d FA Obsn Bn, Ft. Sill
Maj. Stuart Williams	527th FA Bn, Camp Gruber
Capt. Edwin L. Dean	623d FA Obsn Bn, Ft. Sill
1st Lt. James F. Harris	Air Tng Stu O Pool, FA Sch, Ft. Sill
1st Lt. Willey P. Keithley	623d FA Obsn Bn, Ft. Sill
1st Lt. William D. Nafziger	75th FA Bn, Ft. Bragg
1st Lt. Carl A. Pieper	Air Tng Stu O Pool, FA Sch, Ft. Sill
1st Lt. Amerigo Stella	9th SvC PW Cp, Cp. Haan
1st Lt. Marvin J. Weinberg	Air Tng Stu O Pool, FA Sch, Ft. Sill
2nd Lt. Montague L. Boyd, Jr.	Borden General Hospital
2nd Lt. Horace L. Mitten, Jr.	623d FA Obsn Bn, Ft. Sill
2nd Lt. Charles C. Read	623d FA Obsn Bn, Ft. Sill
2nd Lt. John M. Stout	623d FA Obsn Bn, Ft. Sill

PERSONNEL DETAILS

Maj. Gen. Ralph McT. Pennell, who had been commandant of the Field Artillery School in addition to his duties as commanding general of the Replacement Training Center since 29 Oct 44, was transferred to the school upon the arrival last month of Maj. Gen. Jonathan W. Anderson as commanding general of the training center.

Gen. Pennell, eighteenth commandant of the School, assumed command when Maj. Gen. Orlando Ward, former commandant, left for another assignment. Gen. Ward was named head of the school in January, 1944.

* * *

Col. John F. Roehm, who returned recently from the South Pacific theater, where he was an assistant corps artillery officer, has been assigned as S-3 of the Field Artillery School. Before going overseas during the present war, Col. Roehm was in command of training regiments at Fort Bragg, N. C., and Camp Reynolds, Penna., and also served as a field artillery group commander. Col. Roehm returned from overseas under the rotation plan. His first tour of duty at Fort Sill was in 1918 as an officer in the 2nd Field Artillery.

* * *

Three members of the staff and faculty of the Field Artillery School were promoted from the rank of major to lieutenant colonel last month: Elijah B. Henby, S-4, Thomas Wiley Walker, assistant S-3 and Operations officer, and Otto Kerner, Jr., executive for the assistant commandant.

* * *

The Distinguished Flying Cross, awarded posthumously to 1st Lt. Paul V. Avritt, field artillery liaison pilot, was presented to

his mother, Mrs. Mattie D. Avritt, of Weatherford, Okla., by Maj. Gen. Ralph McT. Pennell, commandant of the Field Artillery School, at ceremonies January 20 on Post field parade ground.

Lt. Avritt, a graduate of the field artillery officer candidate school and liaison pilot course at Fort Sill, rescued a "Spitfire" pilot, who had been forced down behind enemy lines, by landing his liaison plane in enemy territory and picking up the "Spitfire" pilot. The action occurred in France on 30 Aug 44.

* * *

The National Foundation for Infantile Paralysis will receive nearly \$400 as the result of a benefit basketball program January 17 in Dan T. Moore hall. Two games were played, with the 6th regiment FARTC five downing the FAS Officers 35 to 26 and the 394th Field Artillery battalion quintet trouncing the 1864th DEML cagers, 51 to 29.

* * *

Field Artillery School war bond purchases for the Sixth War Loan drive totaled \$287,655.25. The total included regular purchases through allotments as well as additional purchases by school personnel and civilian employees during the months of November and December. The total is based on the actual purchase price of the bonds.

* * *

Capt. Leo P. McCarter, secretary of the department of motors, FAS, recently marked his 30th anniversary as a soldier. A master sergeant when the present war started, he has been with the department since it was organized in 1919. During World War I Capt. McCarter was a member of the 9th Field Artillery, which served as school troops at Fort Sill.



Even after the last gun has been fired many a month will pass before all our fighting men are home. Some will be confined in hospitals for long periods of recovery. Traditional Red Cross service for these men who have sacrificed so much must continue unabated.

No less than sacred is the obligation to stand by with all necessary aid while veterans of this war, now being returned to civil life, adjust themselves to new conditions, prepare to take their rightful places in field and factory.

The welfare of the families of our men in uniform, their wives and children, their aged parents, must be guarded to see they do not suffer want in these trying times.

Refugees and waifs of war need help—help such as only the Red Cross is prepared to give in a war-scarred world.

Those essential and humanitarian services which at home have characterized the Red Cross through the years must be continued: disaster relief, home nursing instruction, nurse's aide training, the many volunteer services, and other activities.

Though the roar of guns may cease, human needs remain. The Red Cross can meet these only with your continued generous support. The President has designated March as Red Cross Month, the period in which the 1945 Red Cross War Fund will be raised. Red Cross activities are financed solely from voluntary contributions and gifts. We all must do our part.

PERSPECTIVES DIFFER

Just before the Germans launched their mid-December counteroffensive, the Executive Officer of a Field Artillery Group wrote us,

"The artillery preponderance of late is most outstanding. Counterbattery in the sector is just about unknown. This differs from our experience a year ago [in Italy].

"There are other differences, too. Here in France, troops that came from Normandy do not have the same view of the German foe as those in Italy. Their plans were never frustrated so often. They still drive much as they do upon maneuvers, without quite appreciating the barriers ever present in Italy during adverse weather, when difficult terrain, limited roads, mines and demolitions, and a more evenly matched force combine time after time to frustrate the best of plans. Their spirit is necessary to end the war without unnecessary delay."



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 EAST GERMAN FRONT (19 Dec 44 to 18 Jan 45)

During the entire period operations have been constant in Hungary. A major Russian offensive was initiated in the Poland sectors on 12 Jan. Changes have occurred in the extreme north and south.

NORWAY FRONT

The Germans had a line substantially along the west boundary of Finland with Norway, from Sweden to Polmak, thence to the head of Varanger Fjord, at the beginning of the period. They have withdrawn without pressure from the Russian forces, and by 18 Jan had reached the line Porsangen Fjord—Biggeluobal (?)—Finn boundary near Mt. Haltiatunturi—thence to boundary between Norway and Sweden. Their advance airfield is near Alta. Nearest air base to this is near Bardu, 40 miles NNE of Narvik.

This front is tranquil. Russian troops have been largely withdrawn and replaced by weak Norwegian forces. The Germans have also withdrawn troops, one division having been identified in January in Italy, just arrived from Norway.

HUNGARY

On 19 Dec the line was

Dukla Pass (?)—Presov (?)—Kosice (G)—Turna (G)—Banreva (G)—Eger (R)—Gyengyoes (R)—Szecseny (G)—Ipoly River to the

Danube—Danube River, with German bridgehead about Budapest—Ercsi (R)—Szekesfehervar (G)—Lake Balaton—Somogysozob—Barcs (R)—Siklos (R)—Villany (R)—Mohacs (R)—Danube River with Russian bridgehead at Apatin—Vukovar (G)—Mitrovica (R)—Sabac (G).

Three Russian Army groups were in line:

**4th Ukraine (Colonel Gen. Ivan Y. Petrov)—north of Kassa
2nd Ukraine (Marshal Rodio Y. Malinovsky)—between Kassa and Budapest**

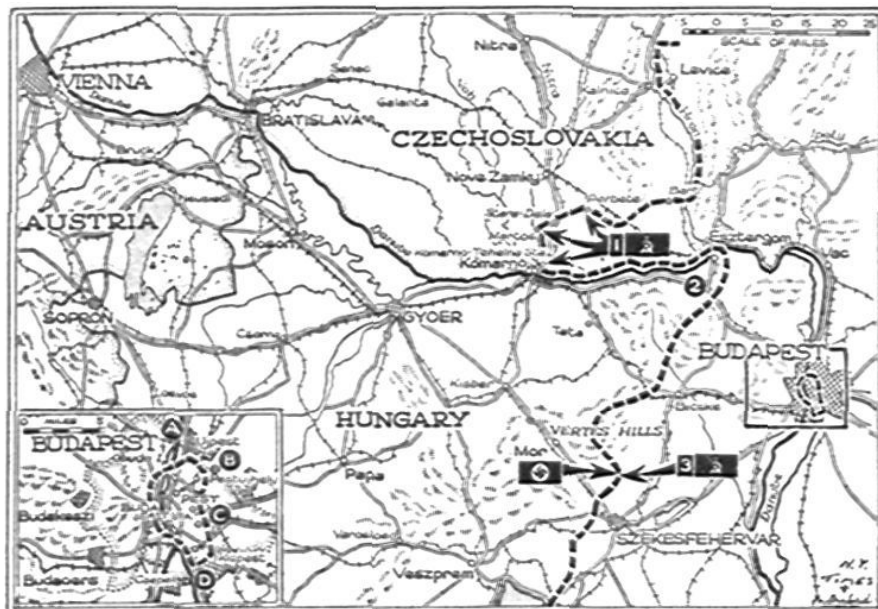
3d Ukraine (Gen. Feodor Tolbukhin)—west of the Danube

Immediate mission of these forces was to capture Budapest and clear Slovakia. The latter objective was necessary in order to protect the left flank of a proposed offensive moving westward north of Slovakia.

On 19 Dec the Russians were attacking everywhere. Progress was made against the south boundary of Slovakia. On the 20th a major Russian offensive was launched between Lake Balaton and the Danube. This met strong opposition but pushed ahead. On the 23d its leading tanks entered Szekesfehervar after an extended tank battle, having made 25 miles in 3 days. The attack against south Slovakia moved forward steadily, gaining a few miles here and there each day. This area is mountainous and covered with woods, while terrain near Lake Balaton was open country good for tank operations. Some Russian armor pushed north and, bypassing Budapest, on the 25th reached Dorog, south of Esztergom.

Budapest was now practically surrounded. All that was left was a corridor along the west bank of the Danube, and this was closed on the 26th with the fall of Esztergom. North of the Danube, Russian forces which had crossed the Ipoly River had a spearhead 20 miles to the north of Leva and Pukanec. Taking advantage of this situation, German forces counterattacked eastward along the north bank of the Danube, cutting the Russian lines of communication. The Russians in turn cut in in rear of this force during the night of 27/28 Dec, by crossing the Danube River from the south bank. This led to a hasty German withdrawal to west of the Hron River. As the Russians reached there first, this crossing became difficult. Large blocks of ice in a rapid current impeded construction of bridges. The Germans were forced to abandon nearly all vehicles, and were lucky to get the personnel back—not, however, without losses.

On 30 Dec the Russians commenced an assault on Budapest. This large city is astride the Danube. Main Russian effort was on the east side against the section known as Pest. A secondary attack was made on the west side against Buda. The latter attack soon was halted, but the eastern attack made progress. The garrison was estimated as about 5 divisions, plentifully supplied



Jan 10th, besides smashing to within 1 1/4 miles of Komarno, the Red Army cut the Nove Zamky railway between Komarno-Tchelná and Perbete, advancing as far as Martos, and also widened their wedge along an alternate rail line to the northeast (1). Meanwhile the Germans' Esztergom salient south of the Danube (2) apparently remained stabilized. Southwest of Budapest (3), according to Berlin, Russian counterattacks penetrated the Vertes foothills. Around the besieged capital Soviet forces captured Obuda Island in the Danube (A on inset), took several more northeastern suburbs (B), fought the Nazi garrison in the East Station area (C), and mopped up the Kispeszt and Csepel Island factory zones. Frame on map represents area of inset.

with weapons and ammunition and including tanks. They received constant supplies of ammunition by air. At the start of the siege airfields were available; transport planes removed wounded at night.

When the Germans fell back across the Hron River the Russians followed, and by 2 Jan were close to Komarom. Here new German forces stopped a further advance.

The German High Command decided to undertake the relief of Budapest, by an offensive south of the Danube directly toward Budapest. To cover the left of such an offensive, the Russians were to be driven back from the vicinity of Komarom. This operation began on 3 Jan for the north side of the Danube, and on the 4th on the south side.

By the 7th the south attack had recovered Esztergom, having advanced 25 miles in 4 days of heavy fighting. The advance toward Budapest was now made in two columns, one proceeding southeast from Esztergom, the other east through Felsoegalla. On the 8th great tank battles occurred, but the Germans failed to make a substantial advance. Now the line was Esztergom (G)—Becske (R)—Szekesfehervar (R). The German attack north of the river had made no progress, but had stopped the Russians. On the 10th, however, the Russians drove the Germans out of Komarom.

On 11 Jan the German offensive south of the Danube made a slight advance. There was considerable fighting but no change on the north side. In Budapest, meanwhile, there had been a continuous day and night street and house battle of great ferocity. The Russians made steady advances in Pest, but not in Buda. By the 11th the defenders held an area about 6 miles from north to south and some 3 miles wide. The Germans temporarily discontinued their offensive west and northwest of Budapest, finding the Russian covering forces to be stronger than had been expected. It was decided to substitute a new maneuver: make the main attack just off the northeast tip of Lake Balaton (where the ground was favorable for armored troops), drive east to the Danube (thereby encircling Russian forces to the north), and advance northward (wiping out these hostile troops while at the same time relieving Budapest). This change in plan required time to redistribute the attacking divisions. It was a question whether Budapest could hold out, but this risk had to be taken as it had been found impracticable to lift the siege by a direct attack.

While these preparations were being made the German offensive on the north side of the Danube, having reorganized, made a new start, and on 14 Jan commenced to make progress eastwardly.

On 18 Jan the Germans, having completed their change of plan, launched a powerful offensive between Lake Balaton and Szekesfehervar. This went right through the Russian front. Armor pushed into Russian rear areas. North of the Danube the Germans had the same success. As this account closes German armor was exploiting the only German success of the period. It should be noted that the Germans neither withdrew troops nor suspended their Hungarian offensive on account of the greater one which the Russians launched in Poland on 12 Jan (see below). It is possible that the Russians thought that their own offensive in Poland would cause Germany to call off her own minor attacks. This did not happen at once, however.

On 18 Jan the line was

substantially following the south boundary of Slovakia from north of Kosice to Levice—Hron (or Garam) River (R)—Danube River to Esztergom (G)—Becske (?)—Szekesfehervar (?)—Lake Balaton—thence no change.

THE BALKANS

Field Marshal Maximilian von Weichs has been the German commander in this area. His mission since 1 Sep has been to withdraw the German garrisons from Greece and the Aegean Islands. This was so far accomplished that all of Greece had been evacuated with practically no loss, and the line temporarily established as

Mitrovica (R)—Sabac (G)—Valjevo (G)—Cacak (G)—Raska (G)—Novi-Pazar (?)—Podgorica (G)—Cetinje (G)—Dinaric Alps to head of Adriatic Sea, with British beachheads opposite Mostar and Knin.

The German position was a huge salient. The country was hostile, and through it operated bands of Marshal Tito's Yugoslav Partisans. Along the east side more Partisans, aided by some Russian troops, were trying to break in. On the west flank the British passed arms and ammunition to Tito's forces but undertook

no serious operations of their own.

The Yugoslav Partisans specialized in sabotage, caused considerable trouble. They also attacked the south and east sides of the salient and any small German detachments they could find within it. Roads were poor and in bad winter shape.

During the period the German retreat has been about 70 miles, the south front having been withdrawn to the line

Valjevo (inc)—Uzice (exc)—Priboj (exc)—Stolac (inc)—thence as before.

THE RUSSIAN GREAT WINTER OFFENSIVE

This was launched on 12 Jan. The main blow was directed westwardly through that part of Poland south of an east-west line just north of Warsaw, and north of Slovakia. Only a brief outline of this offensive can be given, as very little information has yet become available.

This particular maneuver—a march directly west through the heart of Poland—has been tried before. The Russians attempted it in 1914 and 1915, and the Poles on a smaller scale in 1939. All were disastrously defeated. In each case the reason was that the German forces based on East Prussia in the north, and/or in Slovakia to the south, advanced respectively southward and northward and cut the



On 20 Jan the Red Army cracked stubborn East Prussian defenses to capture Tilsit and, farther south, Kreuzingen, 45 miles from Koenigsberg (1). A second penetration of the Junker province, according to the Germans, was made in the south when the Russian column presumably headed toward Danzig took Chorzele, Neidenburg, and Gilgenburg (2). Marshal Zhukov's armies seized Wloclawek on the Vistula and, to the south, Kolo, on the main road to Berlin (3). Enemy reports said a third Russian force had scored a 6-mile penetration in Silesia by reaching the Kepno-Namslau area (4). Premier Stalin announced capture of the fortress city of Nowy Sacz, north of the Carpathian Range (5).

communications of the attacking forces.

This was well known to the Russians. Precautions were taken to prevent a disaster from recurring. This was the more important as the Germans had not only large forces in East Prussia, but also an estimated 30 divisions in Latvia, which was well in rear of the right of the prospective offensive.

To eliminate danger from Slovakia, the 2nd Ukraine Army Group had attacked Slovakia from Hungary. This had not penetrated deeply into Slovakia, but it was believed that it had tied down whatever German troops were in that area.

An attempt to reduce East Prussia had been made in the autumn. This had failed, as had two strong attempts against the Latvian beachhead. As a preliminary operation a third attempt was launched in Latvia on 21 Dec by about 50 divisions. This attack was pushed with vigor for 5 days, but like its predecessors had no substantial success. It is assumed, but not known, that a suitable containing force has been left in Latvia.

When the Russian offensive was launched the line was approximately **German beachhead at Memel—Baltic Sea—Memel River—Eydtkuhnen (R)—Gumbinnen (G)—Goldap (G)—Augustow (R)—Biebrza and Narew Rivers with Russian bridgeheads on both sides of Pultusk—Zegrze (G)—Praga (R)—Vistula River, with Russian bridgeheads just south of the Pilica River, and around Sandomierz and Baranow—Wistoka River—Jasiotka River—Mielec (R)—Ropczy (R)—Fryszak (R)—Dukla Pass (?)**.

Five Army Groups took part in the offensive; in line from north to south:

**3d White Russian—Col. Gen. Ivan D. Chernyakovsk
2nd White Russian—Marshal Konstantin K. Rokossovsky**

which two groups were opposite East Prussia and charged with overcoming the German armies therein. South of Warsaw were

**1st White Russian—Col. Gen. Gregory K. Zhukov
1st Ukraine—Marshal Ivan S. Konev
4th Ukraine—Marshal Ivan Y. Petrov**

The 1st Ukraine led the attack on 12 Jan with an estimated 15 armored and 90 infantry divisions. An extraordinarily strong artillery preparation preceded the launching of the assault, which was on a 25-mile front between Sandomierz and Baranow. As the sky was overcast there was no air support. Following the artillery preparation the Russian infantry

advanced only to the German front line trenches, which were captured. Then a 2-hour artillery preparation was fired against German rear lines. The infantry and tanks jumped off at 1200 hours behind a rolling barrage, described by the Russians as solid wall of fire which wiped out all opposition up to the limit of the gun ranges. It seems that this wall of fire concentrated on opening passages through defenses, including mine fields, and was not uniformly distributed over a wide front.

On the 13th the attack reached the line Chmielnik—Busko.

In the same way that the 1st Ukraine attacked the 1st and 2nd White Russian Army Groups in turn attacked on the 14th, respectively westward from the bridgehead at the mouth of the Pilica and to the northwest across the Bug River between Warsaw and the Pultusk bridgeheads, inclusive. There still was no air support.

On 15 Jan, in the same manner, the two flank Army Groups (3d White Russian and 4th Ukraine) attacked westward, respectively south of the Memel River and from Sanok along the base of the Carpathian Mountains.

No details of the various operations of the Russian Army Groups are yet available. Neither is there information as to German movements. It is known that Russian spearheads of armor have dashed through openings blasted through defense lines by the artillery. By 18 Jan the leading Russian elements had gained about as follows:

3d White Russian in 4 days had advanced about 20 miles toward Tilsit. Its front extended 50 miles south from the Memel River, to near Goldap.

2nd White Russian in 5 days, with an estimated 5 armored and 25 infantry divisions, had reached the line Ostroleka (R)—Przasnysz (R)—Ciechanow (R)—Plonsk (G). Maximum advance: about 25 miles.

1st White Russian in 5 days, with an estimated 5 armored and 40 infantry divisions, reached the line Sochaczew (R)—Lowicz (R)—Skiernewice (R). Warsaw had been abandoned by the Germans on the 17th, without contest. Maximum advance: 50 miles.

1st Ukraine in 7 days reached the line Radomsko (R)—Czestochowa (R)—Krakow (G). Maximum advance: nearly 90 miles.

4th Ukraine in 4 days reached the line just west of the Wistoka River, an advance of under 25 miles.

THE WEST GERMAN FRONT (16 Dec 44 to 18 Jan 45)

On 16 Dec Allied armies were in line as follows:

21st Army Group (Field Marshal Sir Bernard L. Montgomery): Canadian First and British Second Armies, from the North Sea along the Rhine River to north of Aachen.

12th Army Group (Lt. Gen. Omar N. Bradley): U. S. Ninth, First, and Third Armies, from north of Aachen to south border of Luxembourg.

6th Army Group (Lt. Gen. Jacob Devers); U. S. Seventh and French First Armies, from Luxembourg to the Swiss boundary.

In detail the front was:

Rhine River from the North Sea to Allied bridgehead at Nijmegen—Mook (German)—Maas River to vicinity Sittard (A)—Gielenkirchen (A)—Linnich (A)—Roer River to Monschau (A)—Malmedy (A)—St. Vith (A)—Our River—Mosel (or Moselle) River—Wellen (G)—Saarburg (G)—Saar River—Sarreguemines (A)—Bitche (?)—Wissembourg (G)—Rhine River—Witternheim (A)—Ill River—Colmar (G)—Kaysersberg (G)—Muenster (G)—Thann (A)—Mulhouse (A)—Kembs (A)—Rhine River to Swiss frontier.

BATTLE OF THE ARDENNES

Beginning in mid-November, the Allies had initiated three major offensives: in the Aachen area, in north Alsace, and in south Alsace. All had continued uninterruptedly and fiercely. The two first had driven the enemy back to his West Wall. It was now necessary to breach this. The south Alsace offensive gained ground, but had not forced the enemy completely back across the Rhine.

The German C-in-C for the West Front was Marshal General Karl von Rundstedt. During the latter half of November, possibly earlier, he determined to undertake a counteroffensive. Available evidence indicates that the mission of the Germans was to disrupt Allied plans by preventing a

penetration of the West Wall simultaneously with an expected Russian offensive on the East Front. A secondary mission was to expend Allied personnel and materiel, and to take advantage of appropriate opportunities which might present themselves.

Commencing about 1 Dec, German divisions were assembled opposite the Ardennes from south of Monschau to the Sauer River valley in Luxembourg. This was a 50-mile front. Some troops came from other sectors of the front. In Holland, by opening dams and levees, country along the Rhine was flooded to such an extent that an Allied offensive would have required extensive bridging operations, taking so long as to give ample time to move troops to meet an attack. Other floods were arranged along the Roer River. The number of divisions thereby made available is not known; it is estimated they did not exceed 2.

Other divisions were withdrawn from the Aachen front and replaced by refitted divisions. The Allies observed this withdrawal, but assumed that the divisions leaving were exhausted. About 2 more divisions were thus obtained. The front selected for the attack was normally held by about 4 divisions. In all, 8 divisions were found locally.

Main strength of the attack lay with about 7 additional divisions furnished by German GHQ, including about 4 Panzer and 3 Volks Grenadier divisions. The Panzer divisions had recently been reconditioned, and had complete equipment with 1945 models of tanks, guns, and supporting air forces. The Volks divisions were new, raised from what we would rate as 4-F personnel. They turned out to be efficient, notwithstanding that the average age was high and that many had physical defects. In all there were about 15 divisions.

The Ardennes sector had been relatively tranquil for over two months. The Allies considered it a rest sector. Although GHQ had noted transfer of enemy divisions to the sector at least 10 days before the attack came, nothing much had been done about it. It was believed these were worn divisions withdrawing temporarily from active sectors.

The German attack was launched at 0630 hours, following a violent but short artillery preparation. There had been an unusual amount of enemy artillery fire during the night, but this failed to attract attention. The short artillery preparation did do so but it was generally believed to relate to some minor operation. Most CPs just waited for information to come in, but almost none arrived.

This sector contained hills and woods. There was fog, and the attack started before day. Some parts of the front were covered only by patrols. Through these nearly unguarded sections the enemy infiltrated in small parties. A squad was noted in one place, a platoon in another. Some battalion CPs did not realize there was an attack until the enemy reached the CP itself.

The line reached by the German offensive on the first day of this new campaign is not exactly known. Numerous bodies of Americans had been bypassed, some were encircled, others were fighting their way out. The average German advance appears to have been about 5 miles, with a maximum of twice this distance for isolated tank spearheads.

The German success was not immediately recognized; neither did higher headquarters at once identify the attack as one on a major scale. The communique issued next day at noon referred to the enemy's offensive: "Southeast from Monschau in the forests, local enemy attacks were repulsed."

On 17 Dec the German advance rolled on. German paratroops were dropped in small detachments in rear of American lines to cut lines of communication and interrupt circulation on roads. German Panzer divisions were identified as in line. It was now believed that the Germans were making a major effort, but that in order to do so they had used their very last reserves. German rocket bombs fell in numbers on Antwerp and at Liege. According to Belgian reports the German air force liberally bombed numerous other cities at night, and did considerable damage. The only information released to date of writing as to the results is that women and children were killed.

The U. S. First Army, in whose territory the German offensive lay, ordered the 82nd Airborne Div to the vicinity of Stavelot and Stoumont to support the 1st Inf Div, which had held the north sector of the attack zone. The south sector, held by the 4th Inf Div, took steps to reorganize that unit. The 7th Armd and 106th Inf Divs in the north central sector were ordered to hold St. Vith; the 78th Inf Div in the south central sector probably received orders, but they have not been ascertained. The 10th Armd and 28th Inf Divs came forward. None of these measures were effective. The Germans rolled on into Belgium and north Luxembourg. The line at the end of the day could not be exactly determined, but it appeared that the enemy was in the vicinity of St. Vith, had passed Heckhuscheid and Wianden, and was around Echternach.

On 18 Dec the Germans dropped more paratroops in rear of American lines with the same mission of interfering with communications. Identifications by the end of the day indicated enemy operations about as follows:

- a. **A German attack against Monschau, after having made initial gains, had been repulsed.**
- b. **A column which included the 1st and 12th Panzer Divs had by-passed St. Vith, where the 7th Armd Div was holding.**
- c. **A column was west of Stavelot. It had some armor and appeared to be heading north for Liege.**
- d. **A column was 13 miles north of Luxembourg (city) and appeared to be headed west. This force had by-passed Echternach, leaving a detachment which had encircled part of the 4th Inf Div.**

Energetic measures were now undertaken to meet what it was certain was a major enemy offensive.

The U. S. Ninth and First Armies were transferred from the 12th to the 21st Army Group in order to have a single commander on the north side of the German salient. The 12th Army Group with the U. S. Third Army, plus detached elements, had its right boundary moved to west of the Mosel River. The Third Army, to be relieved by elements of the Seventh Army, was to move by the left flank to south of the German salient. It was hoped that the 21st and 12th Army Groups might bite through the base of the enemy's penetration area and thereby cut off the head. All other Allied offensives were discontinued.

The 101st Airborne Div was ordered to proceed by motor transportation from a rest area to Bastogne, which was figured to be the most advanced place they could reach before the enemy arrived there. By quick work this division's leading elements reached their destination at 0100 hours that

night and, as calculated, before the enemy arrived. The only loss was the division's hospital, which in the night encountered enemy on the road and was captured.

The Third Army seems to have received its orders very late. It had immediately available the 80th Inf Div, which had arrived in the Bitche area on the night 17/18 with a view of entering line in that sector to replace another division coming out. The motor transportation was waiting at Bitche to take back the relieved division. This order was cancelled. The 80th left after midnight for Luxembourg City. It arrived in due course and took position to the north, but found no enemy.

It took all of the 19th to transfer Seventh Army troops to the former Third Army sector in north Alsace. Thereafter this movement continued with great rapidity until completed during the night 21/22 Dec.

Field Marshal Montgomery assumed command of the two American armies and issued his orders around noon of the 19th. He sent British troops to prevent a possible enemy advance toward Antwerp, which was under heavy rocket bomb fire, and American troops to the north side of the German salient. A new British force was organized and ordered to get in front of the advancing enemy.

The enemy in general pushed on to across the road Liege—Bastogne. Finding the latter place held, he left a detachment and went on around it. The 101st Airborne Div, being encircled almost at once after arriving at its destination, organized a hedgehog defense. It was joined by a number of retreating units, including elements of the 10th Armd and 28th Inf Divs. The Germans announced that 20,000 prisoners had been captured.

On 21 Dec it became evident that the enemy was not attempting to advance toward Liege, but was heading west. New Allied measures had not yet become effective, so by the end of the day the Germans had arrived about on a line

Monschau (A)—Faymonville (?)—Malmedy (?)—Stavelot (A)—Habiermont (G)—Vielsalm (A) with U. S. armor holding a road block in vicinity of St. Vith—La Roche (G)—St. Hubert (G)—Wiltz (G) with U. S. road block at Bastogne—Echternach (?).

On 22 Dec the Third Army, having completed its move in remarkably short time, attacked northward at 0600 hours, roughly on a front about 6 miles north of the line Arlon—Luxembourg City. Main effort was on the left with a view of relieving the troops at Bastogne, who had by now been surrounded but who at 1130 hours rejected a demand to surrender. The main attack was by the 4th Armd and the 26th, 4th, 5th, and 80th Inf Divs on a 17-mile front. On the north side of the salient the 21st Army Group ordered the abandonment of the St. Vith road block; the 7th Armd Div withdrew to the north.

Allied GHQ issued a General Order calling upon every man to rise now to new heights of courage, of resolution, and of effort to turn the enemy's great gamble into his worst defeat. GHQ appealed to the Strategic Air Force, whose headquarters were in England, for tactical aid which was promised and liberally given, by daily bombings.

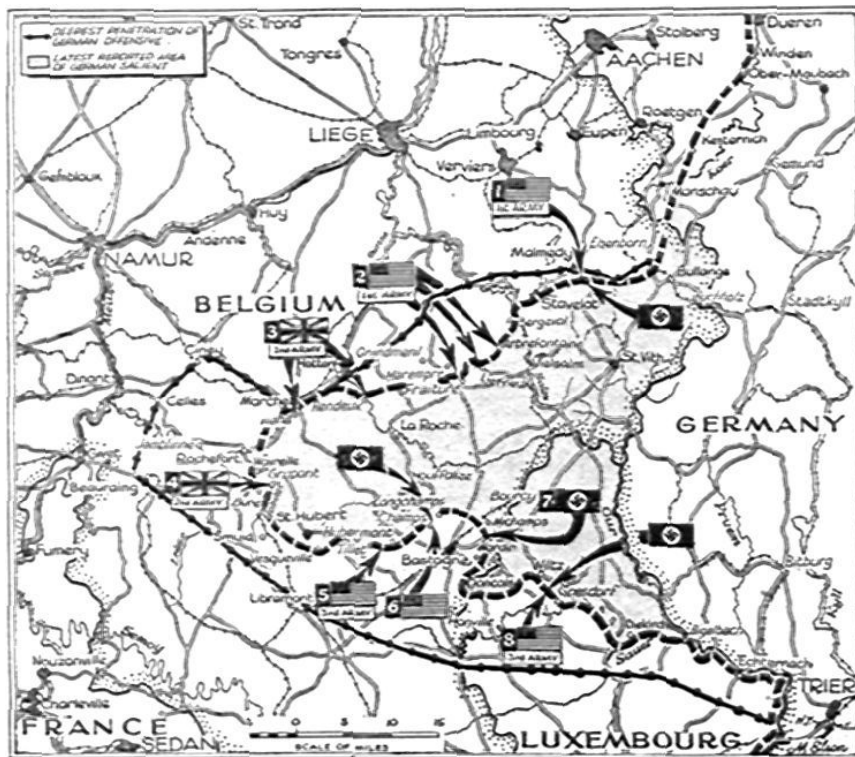
At this season of the year the sky is usually clouded. Direct air support of troops is only occasionally possible. The Air Force by day and night bombed enemy lines of communication in rear of the battle area with great intensity. There is as yet no reliable information as to how effective this was.

The attack of the Third Army met strong resistance when it encountered the enemy about halfway from Arlon to Bastogne. Limited progress was made. On the 23d this attack was continued and extended to the east to the sector south of Dickirch. A supplementary attack was made on the north by American armor striking south near Stavelot. The enemy's front moved west, filling in the center to reach the line

Hotto (A)—Marche (A)—St. Hubert (G)—Libramont (G)—Rosieres (G)—Chaumont (G)—Bigonville (G)—Tadler (G)—Dickirch (G).

On the 24th, the Third Army made slight progress in its attack. The Stavelot effort appears to have just failed of breaking through, but it stopped with only minor gains. Enemy armored detachments on the west reached Ciney and Celles. This was their greatest advance—about 50 miles.

On Christmas day the Third Army continued its attack, while the Germans attacked Bastogne. The Third made progress but it was hampered by snow. The German attack was repulsed, although some tanks penetrated and raided rear areas; most were captured. Next



Jan 5th the American First Army repulsed local attacks near Malmedy (1). It captured Arbrefontaine, closed on Lierneux, took Malempre, and neared Fraiture (2). The British Second Army, which was disclosed to have joined the attack against the northern flank of the German salient, seized Rendeux and reached Waha (3). It also won Bure and advanced to Grupont (4). On the southern side of the salient the American Third Army gained a mile near Hubermont (5), repulsed counterattacks near Champs and Longchamps (6), but withdrew one to two miles between Michamps and Wardin (7). It hurled back assaults west of Goesdorf (8).

day the Third Army attack made contact with Bastogne. British troops of the 51st Highland Division were now in line opposite the tip of the enemy salient. Aided by American armor, Celles was reoccupied, the enemy not seriously contesting it.

Not much change occurred through the 29th. The Third Army made slight gains in heavy fighting and completely relieved Bastogne. According to German reports, there were at this time 26 American divisions (out of a supposed total of 44 on the West Front) and one British division around the salient. All of the Ninth Army divisions had been identified on the north side of the salient. The old sector of this army had been taken over by the British Second Army.

Now began a long struggle with daily intense battles through snow and ice, and often during snowstorms. This gradually reduced the German salient. It was a nibbling process. Attacks against the base had no success. The advances were at the tip. As the tip withdrew, corresponding enemy withdrawals were forced along the outer flanks.

On the 30th Rochefort was taken after a hard 2-day fight. On the last day of the year the Third Army launched an attack astride the road from Bastogne to Houffalize, jumping off on a line 3 miles beyond Bastogne. The distance to go was 7 miles. German resistance was by no means passive. Constant counterattacks held the Allies to small daily gains.

Early on New Year's Day a strong German air force raided Allied airfields in the vicinity of the battle area. According to German reports 478 Allied planes were destroyed, mostly on the ground; according to Allied reports, 125 German planes were downed. Neither side has acknowledged its own losses.

On 3 Jan the 21st Army Group launched a concerted attack along the north side of the Ardennes salient. This was 13 days after the Third Army had attacked on the south side. The south attack was continuing, but meeting strong resistance. On this day a snowstorm limited visibility to about 200 yards. There was no air support, and artillery support was hampered by inability to locate the targets. Rain of the night before had

frozen. Roads were covered with ice. Trucks and tanks skidded; guns went into ditches; many vehicles slid in circles down slopes. Telephone lines were disrupted by the behavior of the vehicles. With low visibility, communication was partly nonexistent and partly poor.

Some of the troops on the north were unable to reach their assigned positions by H-hour (0830). The attack went on without them. The fighting was difficult and violent, and the Allies made only slight progress. As the Germans counterattacked toward Bastogne, no gains were made in that area. A slight gain was made on the north between Stavelot and Grandmenil, a 12-mile front where the main effort was made. At the end of the day the line was

Butgerbach (A)—Malmedy (A)—Stavelot (?)—Grandmenil (A) — Marche (?) — Rochefort (A)—St. Hubert (G)—Long-champs (?)—point 6 miles northeast of Bastogne—Luttrebois (5 miles SSE of Bastogne) (G)—Dickirch (G).

The attack was continued on the 4th, and extended on the north side westward to Marche. The weather was bad—snow and sleet. Roads were mud, ice, and snow. Off the roads the terrain was rough, and vehicles slipped, skidded, and crawled. It snowed again and there was no visibility. In two days the average advance had been about a mile, with a maximum of 2 miles in places. Losses were reported as heavy.

On 5th Jan the north attack made progress but the south did not. The Germans counterattacked between Bastogne and Wiltz in a series of almost continuous operations which prevented any Allied advance. Next day further gains were made on the north, against constant heavy resistance. Lierneux was taken.

Slight additional advances were secured next day, at the end of which the line was approximately

- 30th Inf Div—in vicinity Stavelot**
- 82nd Airborne Div—between Arbrefontaine and Verleumont**
- 83d Infantry Div—south of Odeigne**
- 3d Armored Div—supporting the 82nd and 83d Divs**
- 84th Infantry Div—with 2nd Armored Div in support**
- 51st British Highland Div—just southeast of Marche**
- 6th British Airborne Div—just east of Rochefort**
- 101st Airborne Div 3 miles northeast of Bastogne**
- 5th Armored Div—just southeast of Bastogne**
- 26th Infantry Div—just southwest of Wiltz**
- 80th Infantry Division—just southeast of Wiltz**

The 8th was a cold day, with the thermometer down to about 0°F. There was a sharp wind. In spite of these hardships, the north attack made limited progress at nearly all points. On the south the attack was extended eastward to near Echternach.

A blizzard set in on 9 Jan. In the morning the battle was renewed as usual. Near La Roche the 2nd Armd Div met a Panzer division. All day a wild tank battle raged around in the blinding snow. Slight gains were made. In the south the Germans continued to counterattack in the Bastogne sector, making little change in the line.

A German announcement was issued stating that the Ardennes battle was similar to the Normandy battle of the past summer, with one important difference. In Normandy, all German forces were engaged; there had been no GHQ reserve. Consequently, when the line was broken it had to be withdrawn to behind the West Wall, involving the abandonment of all of France. In the Ardennes such a situation did not exist. There was now a GHQ reserve, and it had not yet been committed. It was in a position of readiness within Germany. It was not likely to be needed in the current operation, for should the armies of Marshal von Rundstedt be defeated, or his front pierced, the West Wall was intact and only a short distance behind the front. It would, if necessary, always be possible for the

German forces in the Ardennes to gain the protection of the West Wall. This was exactly what it was for.

This announcement may have been for Russia's benefit. A major Russian offensive was expected shortly. The Germans probably wished Russia to know that the German reserve was free to oppose Russia's armies.

It is probable that Germany did have a GHQ reserve. On the Ardennes front new Volksgrenadier Divisions had been identified. These were new organizations, formed from men who had previously been exempt from the draft on account of the nature of their employment or because of physical defects. These new divisions had a certain number of regular officers and NCOs. They had had an intensive 2-month training course, and were well equipped. It was noted that these divisions were efficient, and fully competent in a defensive role.

On 10 Jan the north attack continued to gain. In the south the Germans made a slight gain west of Bastogne, but elsewhere were pushed back for short distances. The Allied advance was now 4½ miles northeast of Bastogne, a net gain of 1½ miles in 11 days.

On the 11th the Germans withdrew from the tip of the salient; Allied troops following occupied Grune. La Roche and St. Hubert were both taken. East of Bastogne, 3 divisions of the Third Army in a vigorous attack broke through the German front. This attack was started at 0100 hours when the temperature was 9°F., and went forward so fast in the night that its progress appears to have been lost. Notwithstanding the success the attack stopped on its objective. The enemy secured the time required to reestablish his penetrated front, for a loss of about 3 miles of terrain.

On the 12th and 13th Allied progress was limited. The Germans counterattacked opposite Bastogne and recovered a mile of ground. This reduced the Allied net gain on its advance toward Houffalize to ½ mile in 14 days of intense fighting.

Without a stop the fighting in this great battle went right on. It not only lasted all day, but extended into the night. Germans were using American tanks which they had captured; Americans used German tanks. In the woods and darkness tanks roamed around in rear areas. Some were tanks cut off, seeking a way back to their respective lines. Others were tanks bent on shooting up CPs, tearing out wires, causing any possible mischief. German tanks mistook American infantry for Germans; some Americans followed German tanks, thinking they were American. The forward zone, several miles deep, was full of parties of both sides who from time to time unexpectedly encountered one another. It was a fluid area.

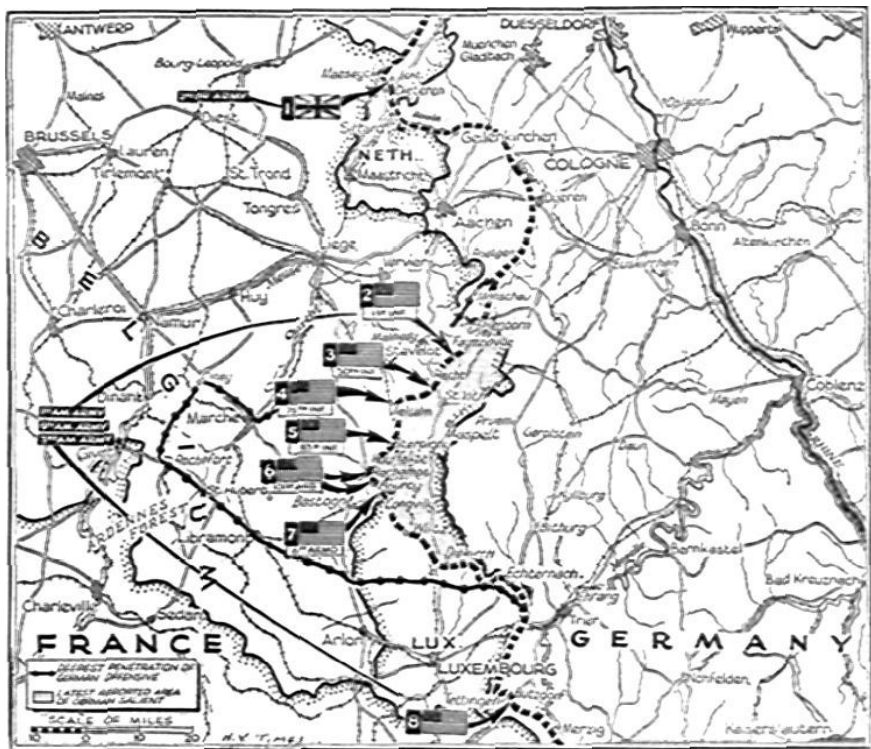
Tanks were used in all attacks, and generally led when the terrain so permitted.

On 14 Jan the north attack continued to advance, with Houffalize as its main objective. It was hoped to reach this important road center before the enemy had withdrawn from the tip of the salient, and thereby facilitate capture of a substantial number of troops.

Next day the attack was continuous all around the salient on a front of about 60 miles. On the north side and around the tip (a 38-mile line) there were on the Allied side 3 armored and 7 infantry divisions in line, or an average of 1 division to not quite 4 miles of front. All efforts to break through the base of the salient were fruitless, but the salient was being slowly eliminated. On the 16th the north attack reached Houffalize, but the enemy had already withdrawn from the area to the west; capture of the long-sought-for town did not materially affect the situation.

On the 17th Vielsalm was taken by the 75th Inf Div without a fight, the enemy having previously evacuated it. Elsewhere advances met resistance; gains were limited to between 1 and 2 miles.

On 18 Jan the entire front was full of action. The enemy was counterattacking, with his main effort at the bases of his salient, with the mission of holding these while the tip made a slow and orderly withdrawal. As this account closes the line for the Ardennes battle area was



Near the period's end British troops, pursuing their new attack above Sittard, captured Dieteren (1) and moved on Echt. American divisions continued to compress the Ardennes bulge. They drove south of Faymonville (2), plunged through Recht (3), occupied abandoned Vielsalm (4), cleared the Houffalize-St. Vith road and moved east to Sterpigny (5), entered Bourcy and Rachamps (6), and gained a mile and a half north of Longvilly (7). The Third Army moved through Butzdorf (8).

- | | |
|-----------------|--------------------|
| Faymonville (A) | 1st Infantry Div |
| St. Vith (G) | 30th Infantry Div |
| Vielsalm (A) | 75th Infantry Div |
| Sterpigny (?) | 83d Infantry Div |
| Houffalize (A) | ? |
| Bourcy (A) | 101st Airborne Div |
| Longvilly (A) | 6th Armored Div |
| | 26th Infantry Div |
| Wiltz (G) | 80th Infantry Div |
| Dickirch (G) | 5th Infantry Div |
| Echternach (?) | ? |

BATTLE OF ALSACE

North Sector

On 16 Dec the U. S. Third Army was engaged in major efforts to enlarge its bridgehead about Sarreguemines. In hard fighting it reached a line through Gersheim (7 miles beyond Sarreguemines) to the northeast and Hottviller, about 12 miles to the east.

Just beyond the latter point the U. S. Seventh Army was also attacking. The left was engaged about Bitche. This town, forming part of the Maginot Line, has a circle of forts around it. Each fort has from 6 to 11 minor fortifications, each unit being normally garrisoned by about 1,000 men. Forts have deep underground levels and ferro-concrete roofs, which held against fire from 240-mm howitzers. The enemy held 4 forts or units; the Americans held 2 forts on the flanks and were attempting to take the remainder. On the right the 14th Armd Div entered Wissembourg, and the 79th Inf Div Scheinbenhardt. Next day this attack came into contact with the West Wall.

On 18 Dec the 45th Inf Div arrived before the West Wall at Bundenthal, the 79th entered Buechelberg, the 103d Inf Div came up on the right of the 45th. At this date practically everything was ready for an operation to penetrate the West Wall. Notwithstanding that orders came to extend the left of the Army to relieve Third

Army troops withdrawing for the Ardennes battle, some minor movements occurred on the 19th. One of the main forts northwest of Bitche was taken. Still another fell on the 20th, when the line was

Bitche (?)—Philippsbourg (A)—Dambach (A)—Bundenthal (A)—Rechtenbach (G)—Schweighofein (A)—Buechelberg (A)—Rhine River to Strasbourg (inc., to Allies).

For the first time German patrols crossed the Rhine, which was only lightly held, and reconnoitered between Strasbourg and the north Alsace border. This activity was extended next day and regularly thereafter to the Wissembourg area and the Waldeck Forest, east of Bitche. The latter lay across the Vosges Mountains, which in this area do not exceed 1,400 feet in altitude. They are covered with dense woods and the terrain is rough, affording opportunities for infiltration.

In view of the thinning of the Seventh Army's front, due to its extension to west of Bitche to the vicinity of Merzig, it was decided that the front would, if pressed, be withdrawn on the right from contact with the West Wall, to the Maginot Line extending from Bitche (inc) to and along the north border of the Haguenau Forest to the Rhine. Necessary measures to recondition the Maginot Line fortifications were immediately undertaken. The enemy commenced daily very limited attacks opposite Wissembourg, gradually recovering pillboxes belonging to the West Wall foreground which he had previously lost. The former American offensive was discontinued.

On Christmas day the Germans by a sudden attack recaptured one of the Bitche forts. In the vicinity of Sarreguemines the American bridgehead commenced to contract slowly, and by the first of the year was back to Neunkirchen, 2 miles outside the town.

On New Year's day an enemy force with tanks and mountain troops passed east of Bitche along the Vosges Mountain ridge line through the woods. It reached the road from Bitche to Niederbronn (Route 62). Other enemy attacks, but not by very large forces, advanced past Sarreguemines on the west side toward Forbach, and on the east toward Rohrbach. Aggressive enemy patrols were reported all the way over to the Rhine.

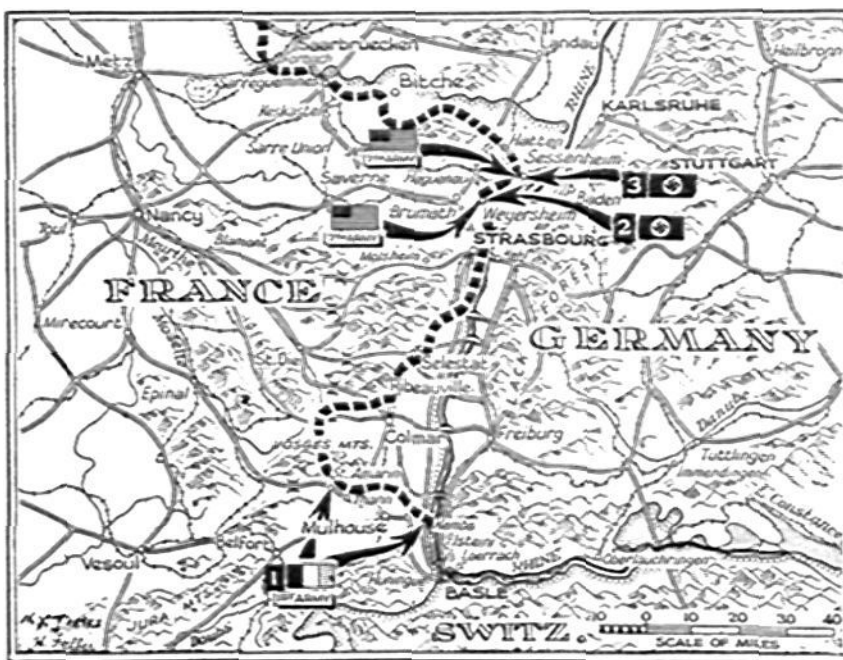
The three German attacks continued on the 2nd. Only that in the Vosges made important progress; it went through the Maginot Line for a gain of 5 miles to near Reipertswiller. This attack was hard to gauge. The woods prevented air observation. The enemy moving along the ridge line could see down the valleys to his right and left, where the country was open and cultivated. Enemy artillery had as good observation as the weather permitted but Allied artillery could seldom locate targets.

On 3 Jan Allied troops commenced to close in around the Vosges salient, with a view to sealing it off. The slow withdrawal to the east enabled the enemy this day to reach the German boundary west of Wissembourg, clearing his West Wall.

On the 5th the Vosges Mountain Germans infiltrated through for 3 miles to Wingen, where they established a road block across Route 419, an important east-west route. Next day the Germans captured a Maginot fort near Philippsbourg. On the same two days small enemy forces estimated as about a battalion crossed the Rhine near Herrlisheim. The enemy commenced to shell Saarlalbe, Saar-Union, and Strasbourg, using 280-mm guns. On the 7th the Rhine bridgehead had been enlarged to a 6-mile front from Drusenheim to Gamsheim.

In view of these enemy moves the Seventh Army had ordered the front withdrawn to the Maginot Line and Wissembourg had been abandoned. The enemy followed, reaching the Maginot Line north of the Haguenau Forest on the 8th. Next day he started a methodical series of attacks to pierce this line, with main effort against the adjacent towns of Rittershofen and Hatten, both of which were strongly defended. He continued to expand his Rhine bridgehead by limited attacks. The fighting about Hatten was extremely bitter.

On 17 Jan the enemy extended his bridgehead on the north side to include Stattmatten, giving him a 10-mile width but an average depth of only 2 miles. On 18 Jan the line in this sector was approximately



Jan. 20, French forces launched a powerful drive against the Colmar pocket to relieve German pressure north of Strasbourg, advancing 3 miles on a front running from St. Amarin to the Rhine (1). The enemy swept to the edge of Weyersheim (2) before being checked by the Seventh Army and forced our men back at Sessenheim (3) after they had reached its outskirts.

Saarbrücken (G)—Saar River, with German bridgehead to Forbach (exc)—Sarreguemines (A)—Rohrbach (A)—Bitche (G)—Wingen (?)—Reipertswiller (?)—Philippsbourg (A)—Woerth (A)—Hatten (?)—Leutenheim (A)—Rhine River to Strasbourg, with German bridgehead through Sessenheim (G)—Drusenheim (?)—Herrlisheim (G)—Gamsheim (G).

South Sector

This was held by the French First Army. Minor operations were under way when the Ardennes battle commenced; these were not immediately interfered with. On 17 Dec Kayserberg was entered and an advance started toward Colmar.

When the enemy made his crossing of the Rhine north of Strasbourg on 5 Jan, the 6th Army Group could not tell whether this presaged a major operation. As a precaution to enable the Seventh Army to strengthen its lines, its right boundary was shifted to exclude Strasbourg instead of including it. In compliance with this order, the French First Army relieved the American troops in that city, assuming control on 6 Jan.

Next day the enemy commenced a new operation south of Strasbourg. He attacked north just west of the Rhine and captured Witternheim. On the 9th he renewed his attack and arrived in Boofsheim and on the 10th the attack reached the line Roosfeld—Herbsheim—Obenheim. The enemy cut off and captured about 300 men. He was using a considerable number of tanks, which overran some of the Allied positions. On 11 Jan the enemy thus cut off and captured 1,000 men at Obenheim, who had been supplied by air for 24 hours.

On 12 Jan the enemy pushed westward toward Benfeld but failed to capture that place. He captured 700 more men by unexpectedly thrusting in this new direction.

On 18 Jan the line was

Rhine River from Strasbourg to opposite Erstein—west to a point just south of Erstein—Ill River—Selestat (A)—Bennweiner (A)—Sigolsheim (A)—Turckheim (G)—Munster (G)—St. Amarin (A)—Thann (A)—Mulhouse (A)—Kembs (A).

GERMAN-HELD FRENCH PORTS

There has been no change. Garrisons are large and appear to be well supplied. The Gironde River, La Rochelle, and St. Nazaire garrisons have each conducted one extensive raid into the surrounding country, to secure supplies.

THE WAR IN ITALY (19 Dec 44 to 18 Jan 45)

Activities have declined. During the period only limited operations have taken place. At the beginning the line was:

Viareggio (Allies)—Gallicano (A)—Barga (A)—Fanano (A)—Montese (German)—Vergato (G)—point 9 miles south of Bologna—Tossignano (?)—Castel Bolognese (G)—Faenza (A)—Ravenna (A).

The front from Faenza, inclusive, was held by the British Eighth Army; it was active. Westward, most of the front was covered by the U. S. Fifth Army; it had been tranquil for more than a month. The American Army included British and Brazilian divisions; the British Army, Canadian, New Zealand, Indian, and Polish divisions.

On 19 Dec the Eighth Army was going ahead with its offensive, which had been continuing since July. The major effort was to advance northwestwardly along the line Faenza—Ravenna, with a view to ultimately reaching the line Bologna—Ferrara. Should the latter line be won the enemy's communication with Germany, which extended around the east end of Switzerland, would be seriously threatened. It was even probable that in this case he might decide to retire from the Po valley and withdraw to the Alps without contesting the intervening territory. Against this hope, however, was a speech by Mussolini, who stated every bit of Italy would be defended. The final Allied objective required an advance of 37 miles.

Fighting started in the foothills of the Apennines, against enemy centers of resistance east of the Senio River and south of the Bologna—Faenza RR. Polish and Indian troops on this sector made slow but steady progress. On the 20th, this was extended north of the railroad as far as the junction of the Senio with the Lamone River. Just below this junction a Canadian corps held a bridgehead from which it attacked. North of Faenza for a 6-mile front an artillery preparation preceded the attacks. Violent fighting followed for a net maximum gain of 1¼ miles. Vigorous German resistance included a number of counterattacks by armored troops. Continuing the next day, the Canadians captured Bagnacavallo and reached the Senio.

This offensive continued against strong opposition both among the foothills south of Faenza and in the low country north of that city. Efforts were now concentrated on the two flanks. On 24 Dec a great attack was launched on the left against the line Imola—Castel Bolognese, while on the right the Canadians attacked along the axis Ravenna—Alfonsine. In two days of battle the left made negligible gains, but the right arrived within 2 miles of Alfonsine.

On 26 Dec the enemy made an unexpected attack on the front Gallicano and Barga and captured both places, which had been held by the U. S. 92nd Inf Div. Mission of this attack appears to have been to complete the training of cadres of Italian Fascist divisions, who participated in this minor offensive. Four of these Fascist divisions have been reported. They were trained in Germany, and had just joined this front. Nettled by this success of the enemy, the Fifth Army counterattacked on 30 Dec, recapturing Barga. The attack on Gallicano failed, as did an amphibious attack which sought to land in rear of

the enemy's right on the coast near Massa. Continuing on the 31st, the counterattack through Barga reached the vicinity of the line originally held 1½ miles to the north.

On 3 Jan the Eighth Army, after a week's time for preparation, launched a new attack in the Ravenna sector. It met strong resistance at once. Not much progress was made until the second day, when the enemy's line was pierced at one point. The German reaction was vigorous—every gain was met almost at once by a counterattack. On the 4th the Allied attack was extended to both sides of Faenza.

On 5 Jan the Canadians, attacking on the right, extended their front to the north so that it reached the Reno River. The remainder of the attack gained but slowly. On the Faenza front some enemy strongpoints still remained east of the Senio River, notwithstanding most determined efforts to eliminate them. On the 6th the Canadians pushed their right down the Reno to the corridor between Lake Comacchio and the Adriatic. The direct attack made no appreciable gain. With this situation, the Allied offensive was temporarily discontinued.

Except for patrol activities and usual raids for reconnaissance purposes, there were no further military operations up to 18 Jan, when the line was

Viareggio (A)—Gallicano (G)—Barga (A)—Fanano (A)—Montese (G)—Vergato (G)—9 miles south of Bologna—Tossignano (?)—Castel Bolognese (G)—Senio River—Reno River to the Adriatic Sea.

The maximum advance during the period was 7 miles out of the 37 required to reach the vicinity of Ferrara, first major objective.

COMMENTS

The designation of the Allied Forces in Italy was changed effective 26 Dec 44 to the 15th Army Group, Lt. Gen. Mark W. Clark, USA, in command. It is part of the Allied Mediterranean Command, of which the supreme commander is Field Marshal Sir Harold R. L. G. Alexander.

Fascist Italy contributes considerable food and manufactured products for the German cause. The Po valley is the industrial center and the greatest agricultural area in all Italy. Partisans are operating in this area, the Germans reporting as of 12 Jan that 2,500 had been captured.

North Italy contains many Fascist sympathizers. Food is more plentiful and prices are lower than in Allied-occupied Italy, where subsistence conditions are bad. Thus the Germans are receiving assistance from north Italy.

Occupation of north Italy enables Germany to maintain a precarious contact with Spain by air.

The frontier between Italy and France has been the scene of minor actions. The front is substantially along the boundary. This enables spies and agents to pass from one side to the other, as each side has some sympathizers in the land of its opponent.

THE PHILIPPINES (19 Dec 44 to 18 Jan 45)

On 19 Dec the American X Corps in northwest Leyte was attacking the remaining enemy, whose main force was near Naghalen, about halfway between Ormoc Bay on the south and Carigara Bay on the north.

The 77th Inf Div was just south and west of Valencia, attacking north. The 32nd Inf Div was near Tolibaw, attacking south, while the 1st Cav Div (dismounted) was in the mountains east of the road Tolibaw—Valencia, attacking west. Filipino guerrillas were in the mountains to the west of the enemy.

The enemy included parts of the 1st, 8th, 16th, 26th, 30th, and 102nd Inf Divs. In all, this amounts to 4 and a fraction divisions.

The American forces were part of the Sixth Army. In addition to the X Corps, there were at this time in army reserve the XXIV Corps and the 7th Inf, 11th Airborne, 24th Inf, and 96th Inf Divs. A detached American force was on Mindoro, holding a base at the southwest corner.

OPERATIONS ON LEYTE

On 19 Dec the 77th Div occupied Valencia. Next day the 1st Cav Div took Kananga, on the road joining Tolibaw and Valencia. This split the

enemy's forces. In view of this situation the enemy began to evacuate the valley extending north from Ormoc, and withdrew across the west mountain range toward Palompon, a small port.

A road to this port passes over the mountains, starting from Naghalen in the Ormoc valley. The 77th Div followed over this road and on the 22nd was 3 miles beyond Naghalen. It was able to shell Palompon, at a range of 20,000 yards. Next day the Ormoc valley was reported as clear of the enemy, who was now confined to the northwest tip of Leyte, in a coastal strip between the sea and the mountains and with poor road conditions. The 11th Airborne Div was mopping mountain areas east from the Ormoc valley.

A direct attack on Palompon by an advance over the mountains not being promising, the 77th Div seized that port by an amphibious movement on Christmas day. At the same time the 24th Div arrived at San Isidro, and the 7th Div at Porto Bello by another amphibious move. Not much resistance was met. All principal points in the northwest tip of Leyte were now occupied, and on the 26th it was officially announced that, less mopping, the Leyte campaign was

closed. During the entire campaign which started on 20 Oct and had lasted 67 days, losses were reported as:

	<i>U. S.</i>	<i>Jap</i>
Killed	2,623	54,833
Wounded	8,422	none
Missing	172	493 prisoners
Total	11,217	55,326

It was estimated that the enemy had lost 48,500 more killed but not found, or believed to be drowned in the sea.

Preparations for a new campaign now began.

On 27 Dec a naval and air battle occurred off Mindoro. The enemy's mission was not entirely ascertained, but his planes caused damage (not made public) on Leyte. The enemy's supporting ships were identified after dark as including 1 battleship, 1 large cruiser, and 6 destroyers. They were attacked by American planes and light naval forces of motor torpedo boats. The enemy surface forces did not proceed beyond Mindoro, and claim to have sunk 4 American transports by gunfire. 1 enemy destroyer was reported as sunk.

MINDORO

The Americans met no opposition from ground forces on this island. They built and opened a large air base near San Jose on the southwest coast, established bivouacs for troops, and accumulated supplies. The enemy watched this base closely. Every day his planes reconnoitered. Frequently they bombed.

Between 27 and 30 Dec the enemy observed a large convoy en route from Leyte to Mindoro, of which he claimed to have sunk 9 transports.

LUZON

Occupation of Mindoro had been followed by troops' landing on Marinduque, an adjacent island. There was no enemy there. The operation was a feint intended to attract the enemy's attention and lead him to believe that an invasion of south Luzon was imminent. It was hoped to thereby attract the bulk of his forces, estimated as 9 divisions, to the vicinity of Batangas and south Tayabas. In the meantime preparations were made to invade Luzon by an amphibious expedition which would land on the south side of Lingayen Gulf.

On 3 Jan and succeeding days an intensive air attack was directed on all known enemy airfields, and on Subic Bay, Lingayen Gulf, and Manila harbor. A very large number of enemy planes were daily reported as destroyed on the ground; about 25 enemy transports were stated to have been sunk.

An invasion fleet sailed from Leyte for Mindoro, passing south of Negros and west of Panay. It reached its destination at dawn on the 4th. Enemy planes were observed shadowing this fleet at 2345 hours, 3 Jan. A second fleet, also observed by the enemy, arrived at Mindoro at dusk on the 4th. Enemy planes attacked but do not claim to have hit any transports; they do claim to have hit 3 warships.

The fleet sailed from Mindoro rendezvous during the night 4/5 Jan and at 0600 hours was well out in the China Sea. At 1115 hours it was abreast of Manila Bay and within view of land. Enemy planes were nearly always in sight. They did some attacking and made some hits.

On the morning of 6 Jan the invasion fleet was off Lingayen Gulf. It had been preceded by mine layers, which had swept channels. According to Jap reports the fleet included 70 warships. At 1024 hours the leading ship opened fire on Bolinao Point at the northwest entrance to Lingayen Gulf, then proceeded along the coast, arriving off Lingayen at 1900 hours. Very heavy fire was directed at towns, villages, and presumed enemy



By 18 Jan, on the east shore of Lingayen Gulf our troops moved north from Damortis toward Agoo (1). Gen. MacArthur's troops were meeting strong resistance in the outskirts of Rosario (2); warships aided them by shelling the town. Between Pozorrubio and Urdaneta, which was captured, light Japanese attacks were repelled (3). Paniqui, on the main road to Manila, was occupied (4). The Lingayen airfield (5) was being used by our planes.

sensitive points. Air forces from the Pacific Fleet bombed over the intended beachhead area. Planes dropped leaflets addressed to Filipinos, warning them to evacuate the Lingayen area immediately; most of the inhabitants left by dark. The Japanese estimated the transports as 150 in number. They remained out at sea. Jap planes attacked frequently and made hits, but the number has not yet been released. They located another convoy off Mindoro.

The naval artillery and air preparation was continued on the 7th and 8th.

Jap forces along the coast of Lingayen Gulf appear to have been approximately one battalion on reconnaissance duty. These withdrew to the northeast on the 7th, leaving only observation patrols in the prospective invasion area.

On 9 Jan the invasion forces landed after an additional blistering naval artillery and air preparation under the control of the 7th Fleet (Vice Admiral Thomas C. Kinkaid). An Australian squadron was attached. The 3d Fleet (Admiral William F. Halsey) was at sea in position to intercept hostile naval forces.

The troops were part of the Sixth Army under Lt. Gen. Walter Krueger, who was present with Army Headquarters. The Supreme Commander, Gen. MacArthur, was also present.

By now the invasion had grown to over 800 ships. The artillery preparation lasted two hours. Troops went ashore at 0930. There was no opposition. Natives reported that there was no enemy in the vicinity.

The invaders advanced with great caution. By night of the 10th the advance was 4 miles inland, and by the next night 7 miles.

Absence of opposition was unexpected. An estimate of the situation was issued on 11 Jan, at which time no enemy force other than reconnaissance elements had been located. It was decided that the enemy had been misled by the landings at Mindoro and Marinduque

and had the bulk of his forces opposite those islands. The statement read, **"Enemy was apparently completely deceived by our landing in his rear at Lingayen rather than in his front on south Luzon, and as yet has been unable to gather his forces. . . . He is now feverishly bringing up troops from his prepared positions in the south."**

The Japanese estimated the American force as of dark 10 Jan as 2 infantry and 1 armored divisions. Their air force continued to be active.

On 11 Jan an important enemy force was located at Rosario, in the hills at the northeast end of the Gulf and about 9 miles inland. Having been discovered, the enemy commenced to shell the Lingayen beaches with 5" and 6" batteries and one or two 12" guns. The maximum range from presumed battery sites was 35,000 yards. Results of this shelling have not been announced. The Japanese said 80 additional transports arrived in Lingayen, presumably with another division.

Next day the enemy lines were further located as extending as far south as Pozorrubio. Fighting developed. The main body advancing south reached the line San Carlos—Malasiqui, about 12 miles inland. The Air Force continued to attack daily all known enemy air fields throughout Luzon. A large number of enemy small craft were reported sunk north of Lingayen Gulf.

By the 14th the flanks had been extended around Lingayen Gulf to include Port Sual on the west and Damortis on the east. No enemy was found.

On the 15th, attacks were started against the enemy between Rosario and Pozorrubio. The enemy had artillery and fought what appeared to be rear guard actions, falling back slowly but only after considerable resistance. The center reached San Miguel de Camiling and Bayambang, meeting only small enemy detachments.

By the 18th the fighting had extended along the east flank on a 20-mile front from Rosario through Pozorrubio and Urdaneta. After an artillery

preparation fired by the Navy, Rosario was captured. Urdaneta was also taken, leaving Pozorrubio in enemy hands. The main body had advanced to include Paniqui, 37 miles inland. There still was no enemy in this direction.

COMMENTS

The enemy spotted, tracked, and attacked the invasion fleets commencing on 3 Jan. According to a report made by the Filipino Bishop of Lingayen, the invasion had been expected for "many days." He stated there were few Japanese in the area.

The batteries in the hills east of Lingayen, which included 12" guns, must have been emplaced in advance. The latter type of ordnance requires very solid emplacements. The gun and its carriage, which is absolutely necessary, weigh each many tons and are a clumsy load to move and to fit together. At American coast fortifications it takes many days to lay concrete, install the carriage, and mount guns of this caliber. It must have taken the Japanese some time to have installed these guns. This indicates some plan had been adopted in advance.

In the week following 11 Jan, the troops which it was charged the enemy was "feverishly" bringing up from the south had not appeared. No further mention of them had been made.

In Leyte, following the official closing of the campaign on 25 Dec, fighting has continued uninterruptedly. The only reports released refer to enemy losses. With one day missing, the daily losses of the enemy have varied from a minimum of 268 killed to 1,287 killed. The total for the 24 days ending 18 Jan is 13,469.

As this account closes, the enemy's main force had not been located. It had been assumed that it was 100,000 to 150,000 strong.

THE WAR AGAINST JAPAN (LESS THE PHILIPPINES) (19 Dec 44 to 18 Jan 45)

SOUTHEAST ASIA

Three British forces are operating jointly to reoccupy Burma by an overland attack. They have been organized into the XV Indian Corps in the south, Fourteenth Army in the center. Northern Combat Area in the north.

The XV Indian Corps on 19 Dec was in Arakan province on the line 20 miles SSE of Maungdaw—5 miles south of Buthidaung—Paletwa (Jap).

The 25th Indian Div was on the right, along the coast, and the 81st West Africa Div on the left, including Buthidaung and the Kaladan valley. Although not known at the time, the enemy was withdrawing from the area west of the Kaladan River. He retained contact, however.

Immediate objective of the XV Indian Corps was Akyab, which had been the enemy's main center of resistance and base in this area. The advance was slow, and on the left averaged only a mile a day. It was quicker along the coast at the beginning, but then also slowed to a mile-a-day rate. The troops reached Foul Point, 4 miles across an estuary from Akyab, at the end of the year.

On 4 Jan an amphibious expedition landed at Akyab, while troops from Foul Point were ferried over the 4-mile water passage. Enemy patrols withdrew to the northeast without offering opposition. At this date the left of the corps was near Kyauktaw.

On 10 Jan troops from Akyab found the enemy in force at Ponnagyun, 14 miles to the northeast on the Kaladan River. He was chased out of positions on the west bank. Since a river crossing at this point presented difficulties, another amphibious expedition was organized; it landed on the 12th near Myebon on Hunter's Bay, 32 miles below Akyab. A strong naval and air preparation covered the landing. Myebon was taken next day against strong opposition. The enemy remained just beyond the town, and was still there when this account closes.

The left of the Corps held a bridgehead at Kyauktaw, with the enemy 10 to 15 miles from that town. No serious attempt had been made to drive him away in this sector. He was quite aggressive and indulged in considerable artillery shelling.

The Fourteenth Army at the beginning of the period held the line Ft. White (Br)—Kalewa (Br)—Mingin (Jap)—Indaw (60 miles NNE of Mingin) (Br)—Pinlebu (Br)—Indaw (40 miles E of Pinlebu, 15 W of Katha) (Br)—Katha (Br).

The 36th British Div was on the left, the 11th East African in the center, and the 5th Indian on the right. The two last-mentioned divisions

constituted the IV Corps. The immediate mission was the capture of Mandalay.

No serious resistance was met at first. On 22 Dec the left had passed Kawlin and Tigyaing and were advancing south. The right from Kalewa was halfway from Kalewa to Ye-u. A detached force had cleared the bend of the Chindwin near Mingin, while a right flank guard marched south from Kalemyo.

Ye-u was reached on 2 Jan. The enemy was found in position on the east bank of the Mu River. On the 4th bridgeheads were established both north and south of Ye-u, and the advance east was resumed on the 6th, under pressure of the corps left, which had passed Kanbalu and was moving south threatening the enemy's right rear.

The advance reached Shwebo on 9 Jan. This is an important road center in the Mandalay Plain. It used to be a Burma capital. Opposition was expected here, as reconnaissance had established that there was a large hostile force in the vicinity. The advance, on a front of nearly 20 miles, moved across country. This being the dry season, tanks were used. No serious opposition was met but there was considerable fire from rear guards. Shwebo was found empty—only 7 inhabitants were there, and these showed great fear of the British. All property had been removed.

Troops moving south from Ye-u occupied Budalin on 11 Jan after a sharp fight. On the 12th the right flank guard captured Gangaw after a heavy air preparation.

At the close of the period the line was Gangaw (Br)—Budalin (B)—Wetlet (Br)—west bank of the Irrawaddy River—Twinng (Br).

The *Northern Combat Area* situation was not materially changed. The 1st Chinese Army was south of Bhamo with 5 divisions. Its mission was to open the Ledo Road beyond Bhamo to a connection with the Burma Road via Loiwing and Namhkam. A provisional force designated as the Mars Task Force covered the right and maintained liaison with the Fourteenth Army.

This is a region of very high mountains. Progress has been almost negligible. An enemy force of unstated strength was encircled near Si-u on 11 Jan; at the end of the period it was still holding.

The enemy in the area Loiwing—Wanting separates the Northern Combat Force from the China Army advancing from Yunnan Province.

SOUTHWEST PACIFIC COMMAND (LESS PHILIPPINES)

In order to release American divisions for the Philippine campaign, relief of several serving in the Southwest Pacific Islands was commenced last fall. On 8 Oct Australian units landed in New Britain at Talisea and Cape Hoskins on the north coast in lieu of the U. S. 1st Cav Div (dismounted), which then proceeded to Leyte. On 4 Nov an Australian amphibious expedition landed on the south coast at Jacquinot Bay, not previously occupied by the Allies. Later another expedition landed across the island at Open Bay. No opposition was met. The enemy on New Britain holds the northeast end, including Rabaul and Wide Bay. This part of the island is the Gazelle Peninsula.

On New Ireland there has been no change. The enemy is supposed to hold the entire island, with main force about Kavieng at the northwest tip.

On Bougainville Australians relieved Americans in October. At that time the Americans held a beachhead about Empress Augusta Bay; the enemy, estimated at 16,000, held the rest of the island. An American detached fortified post of 1 company of infantry plus a 75-mm battery had been 14 miles south of the beachhead, at the mouth of the Jaba River. The enemy held a similar post on the opposite side of the Jaba, which here was about 500 yards wide. By informal understanding the Jaba River was off limits for military activities, and swimming and fishing proceeded without interference while forces remained on their own side of the river.

Around the main beachhead the enemy holds a ring of pillboxes.

The Japanese are reported as well established on Bougainville. They are in good physical condition and well equipped. They have next to no planes, but efficient AAA. The natives, estimated at 40,000, are divided as to their sympathies. In the south they are very antagonistic to the Japs, and have been waging a guerrilla warfare against them. Other tribes have accepted the Japanese and are working with them, while others aid the Allies. The Japs have detached posts in the Shortland Islands and on Choiseul Island.

All known Japanese establishments in New Britain, New Ireland, and the Solomons are regularly and frequently bombed by Allied planes.

Australian garrisons have replaced Americans at Emirau, north of Kavieng; the Green Islands, between New Ireland and Bougainville; Treasury Islands, south from Bougainville.

Japanese are reported on Guadalcanal, but are believed to be limited patrols.

At all places the Japs are raising their own vegetables and living off the country. They receive occasional supplies by submarines and by air. There is no reliable information as to how effective the enemy's supply line is.

On the great island of New Guinea there has been no change in the military situation. A strong Jap force holds the area between the Sepik River and Wewak, both inclusive. A smaller force is near Sarmi, others are in Geelvink Bay and to the west thereof. By constant Allied air activity these enemy forces are believed to be isolated and incapable of action other than to maintain themselves.

Allied forces hold the south end of Morotai Island, just north of Halmabera. The enemy holds the remainder of the island. There has been military activity on this island, and the enemy was reported to have lost during an unstated period ending on 7 Nov 558 killed and 86 prisoners.

Allied planes reconnoiter constantly through the Netherlands Indies, and bomb Japanese bases frequently. Special attention has been given to Brunei Bay and Sandakan in Borneo and to Celebes.

PACIFIC FLEET COMMAND

An air base has been established on Peleliu Island in the Palau Group. From there planes since the first of the year have been able to operate over Luzon and the Visayas Islands, and have aided in the invasion of Luzon.

On 3 Jan Fais Island (east of Ulithi) was occupied by American troops. There was no enemy there.

A bombing campaign is regularly maintained. This includes

In the north: the Kurile Islands, especially Paramushiru. Also Marcus and Wake Islands.

In the Bonin and Volcano Is.: Iwo, Chichi, and Haha. Iwo was heavily bombed, and shelled by surface forces.

In the central Pacific: Rota, Yap, Nauru, the Marshall Islands.

The most important activity of this command has been the operations of

the 20th Air Force's 21st Bomber Command, based on Saipan, against Japan; and the attacks of the fleet's carrier planes.

Attacks on Japan included:

27	December	against	Tokyo
3	January		Nagoya, Osaka, and Hainomatsu
6	"		Omura
9	"		Tokyo
14	"		Nagoya

The average loss of American super-bombers was 1 per trip.

Fleet-carried planes attacked Formosa and adjacent islands and waters with between 400 and 500 planes on 3 and 4 Jan. The enemy was reported to have lost 11 planes and 25 ships. A new attack by about 450 planes was made 9 Jan. Between 14 and 17 Jan, both inclusive, daily attacks resulted in reported destruction of 14 ships, plus an unstated number of others amounting to 82,000 tons. On 14, 15 and 16 Jan the attacks were extended to the mainland covering the harbors of Hong Kong, Canton, Amoy, and Swatow.

Between the two last expeditions against Formosa, a detachment of the fleet went south and its planes raided the coast of Indochina on 12 Jan. 41 ships of 127,000 tons were reported destroyed, and 15 enemy planes with them.

In all bombings adjacent land targets were attacked. There is no reliable information as to the damage thereby caused.

The general result of the air activities of the Pacific Fleet has been to clear the China Sea of enemy craft and to greatly reduce enemy air activity in this area.

CHINA

There have been no military operations of importance.

The expected Japanese invasion of Kweichow province has not taken place. After the occupation of Kwangsi province, a Japanese detachment advanced northwest about 50 miles toward Kweichang, the capital of Kweichow. This covering detachment subsequently withdrew.

The Japanese have been dismantling the railroad from Liuchow to Kweiyang, indicating that they have no present intention of advancing in that direction. The rails removed are presumed, but not known, destined to complete the railroad south from Liuchow into Indochina.

Latest available reports indicate that there was a 200-mile gap, which had been surveyed and along which some grading had already been done. There is no information as to the progress of this task. If and when finished it will complete the overland route from Korea to Singapore.

The political situation in China, which has interfered with China's prosecution of the war, has not been settled. There are still three governments in China, with headquarters respectively at Chungking, Yenan, and Nanking. The first is backed by the Allies; the second would like aid from Russia; and the third is pro-Japanese.

Each of these three governments has the desire to secure the independence of China. Each is satisfied that this can only be secured by the aid of a foreign Power. Each of the three looks to a different Power. Each expects and wishes assistance, but is counting upon the aiding Power's withdrawing from China when the war is won, without demands for colonies, bases, or special privileges.

The U. S. 14th Air Force is actively aiding Chungking China. It has opened new bases in north China. Notwithstanding the loss of its former bases in Kwangsi, this ubiquitous command continues to operate throughout south China. It also covers the Yunnan frontier with Burma.

Our Air Transport Command is carrying enormous quantities of stores into Chungking China. It has expanded its activities to include distribution within China. This has been highly successful, and has largely solved the problem of transportation in a country having few roads and those mostly in poor condition.

The Burma Road is expected to be opened shortly. The enemy has one block on it, at Wanting at the Yunnan border. The Chinese captured this place on 3 Dec but lost it to a counterattack on 4 Dec, leaving the situation unchanged. The siege continues.

After the one remaining block is removed, it will be necessary to repair the road. The wet season will not start until May. It will probably be possible to use the road to some extent until that time. Previously the road was open for traffic only during the dry season. To make it an all-weather road, an estimated period of 6 months' work is required.

BATTLE NOTES

By Maj. Harold S. Davis, FA

Warfare in Europe has recently* become more or less set in its pattern. All towns are strong points, all troops are road-bound. We constantly drive the Germans from town to town along the roads.

In so doing we have found that towns are excellent for CPs. The speed with which a CP can be set up in a house (no digging required) and the additional comfort and protection have convinced us that it is superior to setting up in the field, although we still do the latter whenever necessary. The chances of the Germans' knowing exactly which buildings are being used for CPs are remote. They would have to level the town to be certain, and if you were in a basement their shelling would still not be too effective. The same factors hold true for them, which explains why they seek towns.

The situation has become so fast moving that we no longer register from dummy gun positions, as we previously did in defensive positions. We have become "sold" on the practice of taking a single piece forward for registration purposes before the battalion has been given "March order." Time and again we have received fire missions before the registration has even been completed. I normally take the single piece up myself and use the 608 on my command car for communication with the plane. With the car parked within a few yards of the gun and using map data—plotting the gun by inspection—we make a rapid registration and have all the data ready by the time survey is completed. The maps (1/25,000) are so accurate we have found target area survey and vertical control unnecessary—we take both from the map after the pieces are surveyed in for location. Direction is taken from points in the vicinity of the position area, and base angles are computed using a grid intersection in the center of our sector as the base point. All corrections are obtained by check point registration.

On one occasion, while registering with a single piece in the new position area, our plane was fired upon by an 88. We immediately transferred to the coordinates given by the air observer and after a few rounds obtained a direct hit on the 88 and on its ammunition dump, which went up in a cloud of smoke and flame. Then we turned back to our check point,

*Written 27 Nov 44.—Ed.

completed the registration, measured the base angle, and waited for any further missions.

Another idea we have carried out very successfully is to adjust with our 105s on enemy artillery and then after replotting pass the adjusted coordinates on to a medium or heavy outfit. Their first salvo is usually right in there. If not, it can be rapidly adjusted with about one more sensing. This method is good for several reasons: the 105 can make a speedier adjustment, it is cheaper to adjust with 105 ammunition, we can neutralize the battery until the heavier stuff comes in to destroy them.

We have found time fire to be excellent against enemy personnel. Prisoners report that they are scared to death by it. One of our observers had a chance to see its effect at very close range back at Pont St. Vincent. He was with the infantry in a fort on top of a hill when by a surprise move the enemy managed to completely surround the fort. They launched their attack and began to ascend the hill. Our FO called for support. Knowing that he and his infantry were in the fort, we decided to give him time fire, using the fort as our adjusting point. He saw the first salvo through the wall slits and moved our succeeding volleys all around the hill, washing it down thoroughly as though with a hose. He said, "Every volley cut them down as though they were wheat." When we finished our effect it was necessary to halt fire long enough to allow German medics to haul away the wounded. The Germans withdrew, but many remained behind as reminders of the effectiveness of time fire.

On another occasion we fired on a suspected OP (a farm house), adjusting with fuze quick and firing for effect with fuze delay. Germans came running out of every door. We greeted them with a few volleys of time fire. Needless to say they hit the ground in a hurry. A moment later several ran into the barn. Two rounds of WP sent the barn up into smoke and flame. Several ran out of the barn and more came from the house. Once again we switched to time fire. Those that were still alive began waving white cloths, others came out of the house waving white sheets, and the medics appeared on the scene and began using litters with great success. We held high ground, so dozens of doughboys had witnessed the exhibition; even the mortarmen enjoyed the show.

EFFECT OF FIRE—By Maj. James A. Metcalfe, FA

A British division, attached to the Fifth Army for the assault on the Gothic line, obtained the following answers from prisoners whom they questioned specifically about the effect of our artillery fires.

1. "What gets you down is the unending harassing fire—that's what makes the nerves *kaput*. You get so that you don't risk going out to relieve yourself. If there's a 20-minute concentration and you've got good positions, you can laugh at it—especially if it's coming down where there's no target at all."

2. "Rest—that's the main thing. To have a few hours' rest, with nothing being pumped at you. But what turns you into a nervous wreck is the continual bombardment going on all the time."

3. "The worst of all is a heavy concentration of fire if it's anywhere near you."

4. "It depends on your nervous make-up. If you have a nervous temperament the worst experience is the concentration. But the average soldier, given good positions, can stand it. He doesn't like the continual harassing fire. That has a gradual, demoralizing effect on the best soldiers."

5. "By night, if you're on the move, the harassing fire is by far the worst."

6. "I think the most demoralizing thing is our own artillery's silence. The new joke is—'German artillery replies with one-round concentration.'"

7. "All Allied artillery effect is terrible. It makes no difference to a soldier who has served five years whether you send over 20 or 100 rounds. He decided to desert two months ago but had to wait for the opportunity."

A FIGHT

By Maj. Edward A. Raymond, FA

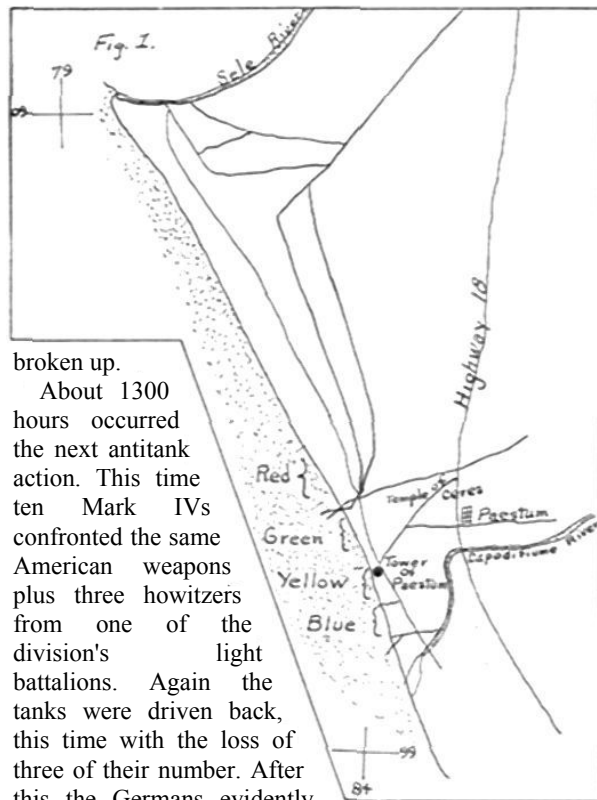
Landings by one British and one American corps of the Fifth Army at Salerno on 9 September 1943 threatened to cut off the three German divisions which were being chased up the ankle of the Italian boot by General Montgomery's Eighth Army. Two of these German divisions were Panzer Grenadier units, the other was a parachute division. The country confronting the Eighth Army was so difficult that the Germans were able to check its advance with minefields, demolitions, and the parachute division. They rushed their two Panzer Grenadier divisions to Salerno and got them there on D+3 (12 Sep). Some of these reinforcements were used to exploit a gap which had opened near the boundary between the British and American corps. Here, in the salient between the Sele and Calore Rivers, the fighting reached its height. Defense of the salient fell to artillery units of the 45th Div (U.S.), which fought with skeleton crews and as infantry, aided by clerks, bandsmen, and drivers and a few engineers. The events leading up to this engagement, as well as the fight itself, are of more than passing interest.

D-DAY

The British corps landed in the Salerno area while the Americans landed around Paestum further south (Fig. 1). The American beaches were named according to the colored lights and panels set up by the engineers as markers. Red Beach was west of Paestum, and troops used the antique Temple of Neptune as a landmark. Green Beach ran from Red Beach almost to the Tower of Paestum, a watertower near the center of the four beaches. Yellow Beach and Blue Beach lay between the Tower and the mouth of the Capodifiume River.

Mark IV tanks kept sweeping the area between Red and Green Beaches and the coastal highway (Highway 18) all the first morning. At about 1020 hours 13 of them came clanking down from Battipaglia and came extremely close to the CP of one of the 36th Div's infantry regiments. In the nick of time, a 105-mm howitzer from a battalion attached to the division came up the road behind a DUKW. There was no cover, but the crew put the gun in action without hesitating and knocked out two tanks. Other weapons in the area accounted for two more, and the remaining German tanks withdrew.

About 1145 hours more Mark IVs advanced within easy range of the 36th Div CP, located in a tobacco warehouse at Casa Vannulo. This time two 105-mm howitzers of the attached DUKW-drawn battalion were in the scrap, together with infantry bazooka teams, a cannon company 75-mm howitzer, and a cavalry 37-mm gun. The tank attack was



broken up.

About 1300 hours occurred the next antitank action. This time ten Mark IVs confronted the same American weapons plus three howitzers from one of the division's light battalions. Again the tanks were driven back, this time with the loss of three of their number. After this the Germans evidently decided that the Red and Green Beach area was too unhealthy for their tanks and launched no more attacks there.

The Panzers found more favorable terrain behind the Yellow and Blue Beaches. Well over a dozen Mark IVs in this area and south of it opposed the initial landing at 0700 hours. The first 105-mm howitzers came ashore at 0800 hours and successfully engaged four enemy tanks on the left flank. An infantry regiment was pinned down a short distance inland, and German tanks drove up and down across the regimental front throughout the day, inflicting heavy losses. Naval fire was adjusted on the Mark IVs whenever they stayed far enough from our lines.

A Tank Destroyer battalion which was later to distinguish itself at Anzio landed at Paestum on D-day and went into position a short distance from the bridge, the Ponte alla Scafa, which carries Highway 18 northward across the Sele River. After the Germans had lost four Mark IVs in a fight with the TDs they blew up the bridge.

D+1 AND D+2

Next day the medium battalion and two light battalions of the 45th Div artillery also came ashore, and by evening of D+1 (10 Sep) the beachhead had been expanded several miles inland from Paestum. The 45th Div artillery went into positions south and west of the junction between the Sele and Calore Rivers (Fig. 2). One of the infantry regiments moved up that night into the wedge-shaped piece between the two rivers. At 0645 hours on the morning of D+2 (11 Sep) a company of tanks, the TD battalion previously mentioned, and a battery of light artillery crossed the Calore. They used a ford prepared by the engineers below a burned-out pile-and-plank bridge. The enemy fired furiously during the morning,

Comment of Chief, Field Artillery Section (US), AFHQ:

The remarkable fight put up by artillery units of the 45th Division in this engagement was made possible by the special efforts of the Division Artillery Officer, an infantry officer in World War I, in training his units to fight with secondary weapons as well as to shoot their guns.

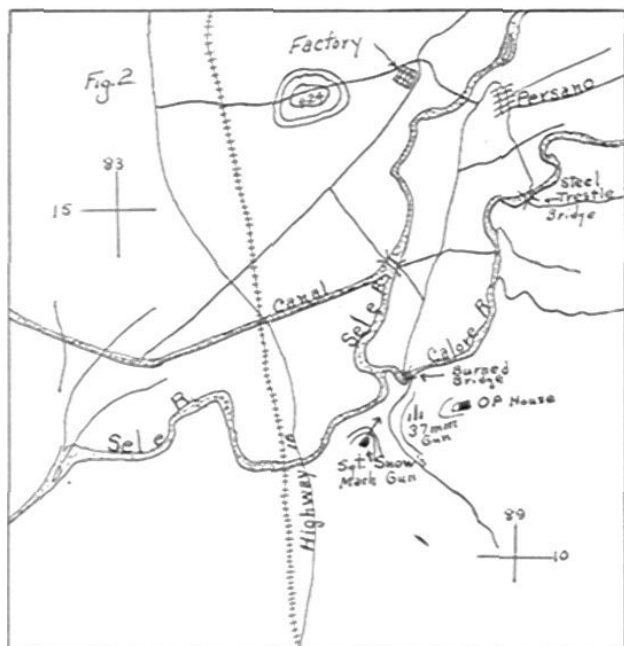
Forward observers should not become involved in the action of the infantry or armored units to which they are attached. It is up to the liaison officer with a unit to see that the attached forward observers are properly employed.

but seemed to be easing up at about 1100 hours. A platoon of tanks, supported closely by Company C of the TD battalion, attacked Persano. Road blocks and 88-mm fire frustrated the attempt and cost us one tank and seven destroyers. In the afternoon another force of tanks and TDs, this time supported by infantry, tried to cross the Calore near a blown steel trestle bridge a mile north of La Cosa Creek, but the attempt failed and cost three more TDs. The two batteries of the direct support artillery battalion in this sector which remained south of the Calore fired so strenuously during the day that they got down to their "iron rations" of ten rounds per gun. At midnight fighting was still heavy and still in the Germans' favor. German thrusts had opened a gap between the British X Corps and the U.S. VI Corps which the British 56th Div was unable to restore. The U.S. 45th Div was ordered to attack on the west side of the Sele River, securing the flank of the Americans, who were out between the two rivers with the enemy at fords behind them.

D+3

At dawn a company of tanks pushed into the Sele-Calore wedge and supported an attack on Persano at 0900 hours. Mines were removed from the road east of the town and communications were established at 1030 hours. West of the Sele a battalion of combat engineers came into action to extend the left flank, and to establish contact with the British by patrols. The engineers were attacked in the afternoon, after heavy shelling, and were almost surrounded. With the aid of naval supporting fires they managed to hold their ground. At 1130 hours a company from the 45th Div took the key point west of the Sele in this sector. The Tabacchificio Fioche ("The Factory") was a group of five large buildings around three sides of a square, on a rise with good observation south and east across the bottom of the Sele-Calore salient.

At 1305 hours the Germans counterattacked with eight medium tanks and a battalion of infantry. A light artillery battalion of the 45th Div stopped the attack for a short while, but within half an hour "The Factory" was again in German hands. The Nazis attempted to continue their drive south at



about 1500 hours, but a battalion of light artillery, a battalion of medium howitzers, and three naval missions drove the enemy back into the Factory. An hour later a chemical mortar battalion laid down a heavy smoke screen, under cover of which two companies of U.S. M-4 tanks cleared out the Factory grounds and withdrew at 1380 hours, leaving a battalion of American infantry well up beyond Factory Ridge.

During the night of D+3/4 (12-13 Sept) the British 56th Div was hit hard by the 29th Panzer Div and lost the important town of Battipaglia. To meet this fresh deterioration of an already bad situation of our flank, the regimental combat team between the Sele and Calore Rivers was moved west of the Factory. A tired and badly reduced battalion of the 36th Div took over the salient. This unit was caught crossing La Cosa Creek in its approach march and was shelled by German artillery.

D+4

On the morning of 13 Sep the Germans rested from their capture of Battipaglia and the 45th Div straightened out and consolidated the new lines. At 1310 hours a light battalion of the 45th Div detected a movement of German tanks and infantry around the Eboli-Battipaglia road and took it under fire. Evidence came of more enemy activity, and by 1530 hours the most serious blow at the VI Corps during the whole Salerno operation was well under way.

First the enemy drove down the west bank of the Sele to get access to crossings in the direction of Persano. Another force struck from both front and rear the battalion which was in the salient. The main thrust came between these two holding attacks, heading for the ford across the Calore at the burned-out bridge and planned to knife into our rear areas.

From a Cub the Asst S-3 of a light artillery battalion discovered the main concentration of enemy armor coming down inside the Sele-Calore triangle from Persano. The plane was reporting this by radio when the set went dead. Flying over the positions of his own battalion and the 189th, the officer tried to shout a warning to those on the ground, but his voice did not carry. The airplane was flying—for once—from a field only 100 yards from the battalion CP. The battalion commander was the next man up. Lt. Col. F—— could not identify the tanks. The leading vehicles were an American jeep and a half-track which might have been ours. A typical battlefield rumor had circulated that the British were making large strides on the north flank, and had retaken Battipaglia. Were these British tanks coming down to make contact? The radio in the plane was functioning again, so the colonel had a round thrown out there to see what would happen. Hardly had "On the way" been given when the German tanks opened fire on advanced elements of the 189th FA Bn. That was all the colonel wanted to know. He placed concentrations in the path of the enemy and turned back.

Intermittently during September 13th the 189th had fired on tank, truck, and infantry assembly points, despite frequent enemy shelling of its positions. At 1535 hours the CP received a report that 25 enemy tanks had broken through our front lines west of the Sele, and at 1800 hours came word of the hostile threat east of the Sele, coming down from Persano.

A party of about 40 engineers was improving a crossing over the Calore near its junction with the Sele, and the battalion commander and his executive had been across at this point earlier in the day. They now decided to go back, obtain

observation, and size up the situation. In a jeep, they drove back to the crossing, dismounted, and hurried across the river. They made their way through the brush along the road on the far side. At this moment enemy infantry, tanks, and armored vehicles approached rapidly. The officers came under rifle and machine gun fire and their retreat to the river was cut off. There was now no infantry between the hostile force and our artillery. The engineers at the ford were forced to retire. Staff Sergeant L. T. Snow (now Lieutenant) saw the desperate situation the field officers were in, and without hesitating took a .50-cal. machine gun out into the open on a hill overlooking the enemy. He had no cover whatever. The enemy had already started to organize its positions. He opened fire, and kept firing so effectively that the battalion commander and executive were able to get back across the river. They found their driver and their radio operator still waiting by the crossing with the jeep. They jumped in and drove back for 600-800 yards up an exposed slope. Machine gun bullets pelted around them all the way, but they were not hit. They drew up behind the hill, left the jeep with its SCR-608 under cover, and went up to a house for observation. Using voice relay to the radio, they conducted the fire of their batteries from there as long as daylight lasted.

Staff Sergeant Snow silenced two enemy machine guns with his own. Shortly afterward he observed a mortar squad firing at the house from which the two officers were observing. He opened fire and the mortar went out of action. By that time a number of tanks and vehicles had shown themselves on the far side of the river. Effective fire from Sgt. Snow's machine gun destroyed an armored vehicle and a captured American jeep. Sgt. Snow remained in full view of the enemy for three hours, being fired upon by rifles and machine guns. He had evidently been selected as a target by some of the enemy mortars, as he was bracketed several times by their fire. In addition, his hilltop was under artillery fire. When the enemy knocked down the OP house at about 1700 hours he covered the move of the two officers to a goat pen just to the east. When the enemy got the range to the goat pen, he covered the battalion commander and the executive as they observed from the open. He did not stop firing until about 2000 hours, when it grew too dark to observe and the officers withdrew.

Across the road from Lt. Snow's position was another rise, equally exposed. When Corporal B. T. Peck saw the two officers cut off across the river he set up a 37-mm gun on the rise and opened fire on enemy positions. He remained under intense rifle, machine gun, mortar, and shell fire until the two officers had gotten back across the river.

In their enforced withdrawal, the engineers who had been constructing the river crossing abandoned some of their equipment. Cpl. Peck noticed a bulldozer sitting there unharmed. After he had done all he could with the 37-mm gun he voluntarily ran down to the river, mounted the bulldozer, got it started, and drove it out of the river bed to a position of comparative safety. The hostile troops concentrated their fire on Cpl. Peck as he maneuvered the unarmored bulldozer at 3-4 mph. It is almost unbelievable that he should have come through unharmed, but he did—with the bulldozer.

During the afternoon ammunition train personnel took 100 rounds of 37-mm ammunition to Cpl. Peck and kept Lt. Snow supplied with .50-cal. bullets, making two trips across the

exposed slopes.

At about 1900 hours the Division Counterbattery Officer arrived behind the OP with a Tank Destroyer; there were three more M-10s pulled up on another hill further back. These swept the Persano road across the river with direct fire; this added to the carnage already produced by the 155-mm howitzers, which had halted a column of enemy vehicles on the road and swept it continuously.

From about 1830 hours on, the 155-mm howitzers were manned by skeleton crews only. The S-3 and the CommO gathered up about 120 men and placed them along the high ground south of the Calore to prevent the enemy from crossing. The 40 engineers who had been driven back from the crossing established themselves on this line. Strong points were established with .50-cal. machine guns and 37-mm AT guns. To cover the deployment, the 155-mm howitzers used direct fire at the maximum rate—and not the rate that is found in print.

The Wth FA Bn (105-mm howitzers) was taking similar measures. The entire line was under constant shelling from enemy guns only 800 yards distant throughout the night.

The division commander was north of the Sele, shifting his troops to meet the serious situation there, and the DivArty commander was with him. The DivArty executive, warned by the Xth FA Bn of the new threat across the Calore, repeated the warning to Division and was told to take command of all troops in the area and hold until some infantry arrived. He was able to reinforce the artillery on the high ground, after about three quarters of an hour, with further detachments of engineers and with additional artillery personnel, including most of the DivArty headquarters, and it was the DivArty executive who obtained the reinforcing platoon of tank destroyers for the 189th FA Bn. The division commander ordered a company of infantry entrucked and moved to the artillery sector; these men arrived as dusk fell, several hours later.

During the night a battalion of the Wth Inf arrived to relieve the artillery. As it was extremely difficult for the infantry battalion commander to make a terrain appreciation during darkness, the executive of the Xth FA Bn took him along the positions and explained the composition and deployment of the enemy's forces.

New positions in the Paestum area were reconnoitered for the 189th FA Bn during the hours of darkness. With some difficulty the men were withdrawn and the medium battalion was displaced to the rear. The men in the lines had been fighting continuously for many hours. The firing batteries had been only a few hundred yards from the enemy and had been pounded with accurate shell and mortar fire. It was necessary to repeat the order to withdraw; the men wanted to keep on fighting where they were. The light battalion was not drawn back.

To the main story of the action, two accounts by forward observers from the light battalion might be added. The first is that of Lt. C. K. Fetzer, who was attached to Company B, Yth Tank Battalion (Medium). The artillery and tank battalion commanders held a conference on the morning of D+3 (12 Sep) at the tank CP. Lt. Fetzer went along and took up his duties at that time. He had never ridden in a tank. The tank battalion commander gave him a few general instructions and warned him to keep his head down as much as possible. Lt. Fetzer mounted up with a platoon commander. He was not permitted to strap his bedroll on the tank—it was too inflammable.

All he took were field glasses, map, SCR-610 radio, and prearranged code.

A German tank thrust, coming down the main highway west of the Sele, had just been reported. The M-4s were ordered out to meet it; they went into a position in a semicircle, under defilade. The platoon commander's tank was among the most advanced, and kept maneuvering about, waiting for the enemy. As Lt. Fetzter tells the story, "The enemy did not come, so the artillery was asked to reduce a large warehouse on the probable route of approach. This was then being used as a strong point and would offer German tanks some cover. The mission was accomplished with the battalion. Although I was nominally a forward observer I acted more as a liaison officer, warning the infantry to clear our field of fire through artillery radio channels and keeping my CP abreast of the situation. We were taken under fire by German heavy guns and I put smoke in front of our tanks. The fire continued. Big shells fell all over the place and began to cause casualties. The platoon commander shifted to another tank and—still on my first ride—I took over his tank. I commanded it in combat for five hours, and until the next day. Finally I became disoriented in the smoke and pulled back to find the remainder of the battalion. I found that a tank provides little sense of security.

"Next day (13 Sep) we laid low in rendezvous during daylight and went out at dusk, while the big fight was going on. After fifteen minutes in action my SCR-610 went out, and the 500-series set in the tank also, so I returned to the rendezvous area once more. The two aeriels, Armored Force and Field Artillery, on the tank caused cross-talk so I went into battle to the music of a band concert. From now on I am going to try to get my FDC to use one of the overlap frequencies between the 500 and 600 sets. Any light or medium artillery may be asked to support tanks at any time and observers should be prepared in advance for the difficulties in communications and technique which they will face.

"I should not recommend riding with a platoon commander. An observer's tank should be assigned with the primary job of carrying him from one vantage point to another. I was with the tanks for five more days. We got no more action, but maneuvered a lot at night."

The other observer was 1st Lt. G. C. Davis, Jr., who went up to Company B, Xth Inf, in the mid-afternoon of 12 Sep to replace an officer who had been hit by an 88-mm shell. "My first activity," he relates, "was to adjust fire on some houses. A machine gun had been seen to fire from an upstairs window at the Cub plane. While the artillery was firing for effect our tanks came up (Lt. Fetzter with them) and used direct fire. They were then forced to withdraw, as they attracted a lot of artillery and AT fire. That night things quieted down, and at 0200 hours on 13 Sep the infantry commander sent me out in charge of a combat patrol of 30 infantrymen to secure the crossroads 1,400 yards up the road, in the vicinity of the warehouse shelled by our tanks that afternoon. One of A Company's outposts covered us by simulating Schmeisser (German machine pistol) fire with his BAR. By morning we noticed enemy observers on a hill up the highway from our crossroads. I adjusted on the forward edge of the small woods they were on and drove them to another patch; then fired on that; and chased them backward and forward several times.

"By 1215 hours the remainder of the infantry battalion came into the line with us and took up a position along the east-west



Built about 700 B.C., the lovely Greek Temple of Neptune at Paestum has stood through many wars. The latest one swirled about it, but left it unharmed

road. C Company to our left had the mission of going in and securing the basin east of Palladina while B Company was to advance to the ridge line in front of us; then both were to move to the right and A Company, in reserve, was to move up on the left flank. I thought I should stay near the warehouse ("The Factory") to command the ground over which the advance would take place, but the battalion commander sent me with the assault platoon of B Company in order to put me on the ridge as soon as possible. We had no sooner jumped off than a patrol reported three German half-tracks with infantry on the north-south road down our flank. The plan of attack was modified to wheel the platoon I was with to bring the road under fire, but this did not stop the motorized infantry. I knew what the presence of those half-tracks meant when I heard another of our observers reporting on a 536 (relayed via 610) to the FDC that there were ten German tanks approaching. I could not tell just where they were over the radio, but was enlightened soon. While the motorized infantry dismounted to form a screen the tanks clanked down the road and our A Company was driven from its reserve position behind us. We could easily follow the situation—the noise of tank treads, the guns, machine guns and rifles, and even the occasional sound of stressed voices, all told their own story. We had to get out of there to avoid being cut off.

"As we edged west to circle around the tanks we were flushed by automatic weapons and driven north through the woods. We crossed a 200-yard clearing to a drainage ditch running east and west. This was occupied by the remnants of C Company. After we got there the number of Americans must have been in the neighborhood of 150, while the number of Germans can not have exceeded 100. It was difficult to get an exact idea of their strength since the thickness of the woods made it impossible to see more than half a dozen Germans at one time. Their tanks gave them a morale advantage. They brought up some 50-mm mortars and pinned us down. About an hour had passed when some of the tanks skirted the edge of the woods and approached a position from which they could deliver enfilade fire on the ditch. At that point our artillery fired a 20-minute barrage through a 400-yard zone on the woods to the north of us. We took six casualties in the ditch from enemy mortar and machine gun fire, but none from our own artillery until we thought that our fire had lifted and

left the ditch. Then a tardy round hit one man. The artillery fire consisted of HE and WP; it broke up the German attack and drove the tanks off. The ditch had some water in it; the smoke and steam from particles of WP screened us. My helmet got too hot to touch. The moist ground gave off intense heat as the WP shells landed and brush and grass along the ditch burned, adding to the smoke. Most of the WP shells buried themselves in the mucky ground so the smoke billowed out of the holes. As a smoke screen the WP was not fully effective. HE had much more of a terrifying effect on me and, as far as I could see, on the others also.

"Once out of the ditch our line of retreat was to the west, parallel to the front and about a mile north of it. We followed

the ditch, which was fringed by trees most of the way. Occasionally we ran the gauntlet, under machine gun fire, across gaps in the trees. Two tanks in fields west of the woods fired their guns at us; these rounds all went over. We stuck pretty close to the ditch and kept dropping back into it when under too much fire. We kept moving, though, as we did not want to be pinned down as before. We finally made contact with the other battalion, and the infantry went back to an assembly area for reorganization.

"I got back to my battalion for the last stages of its fight. You could feel the confidence and determination all around there. Our boys in the division artillery put up one magnificent fight that day, and the officers did their stuff."

TRENDS in Field Artillery Organization & Equipment

By Maj. Shirley B. Metzger, FA

Transportation in the command and staff section of Headquarters and Headquarters Battery, Division, Armored Division, T/O & E 6-160-1, is being changed by substituting three (3) Car, half-track, M3A2 for three (3) of the weapons carriers now authorized. The half-tracks will each mount a machine gun, cal. .50.

Telephones in the Headquarters and Headquarters Battery, Field Artillery Group, T/O & E 6-12, are being increased from 17 to 22.

The Reel RL-39 will be issued without the Spool DR-8, which was formerly a component part of the RL-39. When authorized in allowance tables Wire W-130-A is issued on Spool DR-8 which can be used in the RL-39. However, where spare DR-8s are needed they will be authorized in T/O & Es as a separate item. In Field Artillery tables the allowances of DR-8s will be calculated on the basis of one (1) per chief of howitzer (gun) section, and one (1) per RL-39.

The parachute maintenance section included in T/O & E 6-216 and 6-216T will be authorized each parachute Field Artillery battalion when not part of an Airborne Division. In the present set-up the section can only be authorized when specifically directed by War Department. A change to T/O & E 6-216 and 6-216T is being published which will automatically make the parachute maintenance section a part of each non-divisional parachute Field Artillery battalion.

Pack Equipment CE-13-() will be included in Pack Artillery T/O & Es when the Radio Set SCR-694-() is authorized. This equipment is used for carrying Radio Set SCR-694-() (less vehicular components) on a pack animal. The item is used with a standard Phillips Pack Saddle. Radio Receiver and Transmitter BC-1306 and spare batteries are mounted in one frame; operating accessories, including Generator GN-58, are mounted in the other; and the antenna roll is the top load. The radio equipment is not operable while being transported, but is capable of being removed and placed in operation within five to seven minutes. The weight

of Pack Equipment CE-13-() is approximately 25 pounds.

The Net, camouflage, cotton, shrimp, is replaced by Net, camouflage, twine, fabric, garnished, and will be qualified by the remark, "Outside continental US when authorized by theater of operations commander." This remark will also be used for camouflage net sets and other camouflage equipment. Authorization for combat vehicle camouflage nets is being moved from SNLs to Section II of appropriate T/O & Es. No other changes in allowances are made. Training allowances for the continental United States will be published in T/A 20-2 "Equipment for Training Purposes."

The Carrier, grenade, three-pocket, was standardized recently with a basis of issue for Field Artillery as authorized by War Department. The item will not be carried in T/O & E.

Quartermaster Organizational impermeable clothing will be withdrawn from individual T/O & Es and will be carried in service batteries for the battalion.

The Kit, sewing, is now an expendable item. It will be deleted from T/O & Es and authorized in Army Service Forces Supply Catalogs.

The Container, Food, M1944, an oblong container, is replacing the Container, Round, Insulated, M1941, with inserts (Marmite can). The new container is designed to be carried on packboards or as the top load on pack animals. Pack units, including all Mountain Division units, Airborne and Infantry units will be issued the new container as soon as they are available. In units other than those mentioned above, the Container, Round, Insulated, M1941, with inserts, will be issued in lieu thereof until exhausted. As an illustration of the efficiency of the new container, it was filled with food, heated to a temperature of 178°F, placed in a cold room in which the temperature was minus 40°F, and fanned with a 20-mile-an-hour breeze. At the end of six hours the container was opened and the food temperature had dropped only 40°F to 138°F, which is still too hot to eat. Food which was placed in the Container, Round, Insulated, M1941, with inserts, under the same conditions had dropped to 98°F, or twice as much as in the new type container.

Use of Mil-Gridded Oblique Photographs

By Lt. J. V. Schurman, FA, and Lt. L. O. Williamson, FA

Use of mil-gridded oblique photographs is one solution to several common problems encountered by Field Artillery units. They make it possible to run target area survey beyond masking hills and to locate points in spite of concealing smoke or weather conditions, and supply a convenient panoramic sketch for ground and air observers. For these purposes, oblique photographs showing the horizon (high obliques) are used. These are usually taken from an airplane. For best results the camera is tilted so that the horizon appears about an inch

considerations, i.e., the danger of antiaircraft fire, etc. However, 2,000-5,000 feet is preferable.

THE GRID

The artillery or azimuth oblique grid consists of a group of straight lines radiating from a point off the photograph to the horizontal line, and a group of curved lines focused about that point (see Figs. 3 and 4). The center radial line is known as the "center line" and numbered zero; the other radial lines are numbered (along the horizon line) from the center to the left and right to correspond to the horizontal angles, as measured at the plumb point, which they represent. The curved lines are numbered down along the center line to correspond to the vertical angles below the horizontal, as measured at the camera position. The horizon line, of course, represents zero site. The grid is usually marked with the focal length and tilt of the camera for which it was constructed and with collimation crosses to permit re-orientation of the grid over a given negative if later reprints of that negative are desired. The form of the grid itself is independent of the height at which the picture was made, but its positioning is not. Obviously, the line of zero site (that is, the "true" horizon) will not be the same as the ground-sky line or "apparent" horizon but will be above the latter. Furthermore, the difference between the two will vary as the altitude of the plane varies. The distance on the photograph between the apparent horizon and true horizon is given by the formula: $d = f \times \tan T - f \times \tan (T - 59 \sqrt{H})$ —where d = the distance in inches between the horizon, f = the focal length of the camera in inches, T equals the tilt of the camera, and H is the altitude of the plane in feet. (The angle represented by the quantity $59 \sqrt{H}$ is in seconds.) To avoid calculating this formula for each picture a single set of calculations is used to construct a transparent "horizon-tilt template" (see Fig. 5). On this is a horizontal line representing the true horizon and below it a series of lines representing the position of the apparent horizon at various altitudes. In use, this template is oriented over the negative so that the appropriate horizon



Figure 1—Oblique photograph (focal length 6 inches, tilt 533 mils)

below the top of the photograph, resulting in a picture such as that shown in Fig. 1. These photographs are normally taken, printed, and gridded by Army Air Force personnel.

Photographs are gridded during printing so that horizontal and vertical angles from the camera position can be read directly from the photograph. If the camera position (or the plumb point, which is directly below it) and an orienting line (the center line) are established for each of a pair of mil-gridded oblique photographs and plotted on the firing chart, the angles read can then be used to locate targets by long base intersection methods. A series of obliques taken with a camera of 12-inch focal length at positions about 1,000 yards apart and with their center lines approximately parallel, will cover the area shown in Fig. 2. The flight is made in two strips so as to get better close-in overlap with the proper length of base.

These obliques may be taken from a high performance airplane flying at about 3,000-foot altitude or may be taken with a hand-held camera from a liaison-type aircraft at any altitude desired. The altitude is controlled largely by tactical

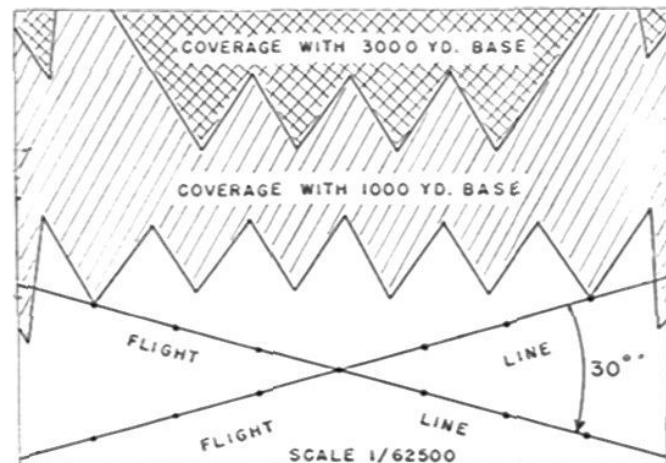


Figure 2—Coverage by oblique photographs (focal length 12 inches)

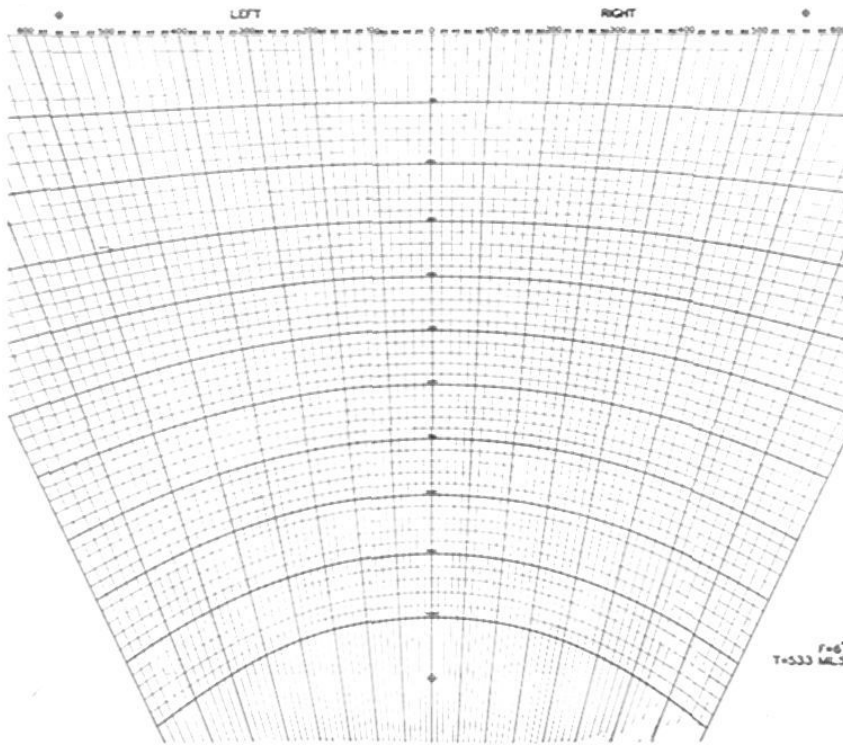


Figure 3—Mil grid for oblique photographs (focal length 6 inches, tilt 533 mils)

line is along the apparent horizon of the negative and the vertical center line passes through the center point of the negative. (The center point of the negative is marked by fastening it in position over two perpendicular lines on a viewing table, with the lines passing through the collimation marks of the photo.) Pin pricks are then made on the negative through the collimating crosses on the ends of the true horizon line and the lower end of the center line. These are used in orienting a grid for printing.

Because of the difficulty of obtaining the exact tilt desired when taking the picture, grids are constructed for various tilt values above and below the standard tilt. In order to facilitate the work in the photographic laboratory in deciding which grid to use, tick marks (whose positions are calculated by the simple tangent formula) are drawn on the center line of the horizon-tilt template. While the template is in position the tilt can be read directly by noting which tick mark falls closest to the center point of the negative. The grid which was calculated for the tilt value closest to the actual one is positioned by means of the pin pricks and contact points made as desired.

ORIENTATION OF THE PHOTOGRAPHS

The first problem in the actual use of the mil-gridded oblique photographs is to locate the camera position or plumb point and determine the direction of the center

line. There are four accepted methods of doing this: The simultaneous-vertical method, the grid-line method, the airplane-intersection method, and the resection method.

Simultaneous-vertical Method

In the simultaneous-vertical method a second (vertical) camera is mounted in the plane with a fixed angle between it and the oblique camera, and the two cameras are timed to "fire" simultaneously. The fixed angle between the two cameras is such that the vertical camera will take an exactly vertical photograph when the oblique camera takes a photograph with the predetermined standard tilt and with the horizon line parallel to upper edge of the photograph (that is, with no "dip" of the horizon). Then, by measuring the dip of the horizon and the difference between the standard tilt and the actual tilt of the oblique camera, the deviation of the vertical camera from the true vertical is found and the plumb point can be plotted on the vertical photograph in its true position. This is accomplished by means of a transparent plate grid (see Fig. 6),

which is a graphic representation of angles measured at the lens of the camera as they appear on the plate or negative.

For convenience, a section of graduated arc is added to the plate-grid to be used as a protractor in measuring the dip of the horizon, or, more conveniently, of the center line of the grid (which is perpendicular to the horizon). The plate grid is placed over the gridded photo so that its center lines pass through the collimation marks of the photo. The dip is read



Figure 4—Mil-gridded oblique photograph (focal length 6 inches, tilt 533 mils)

Figure 5—Horizon-tilt template (focal length 6 inches)

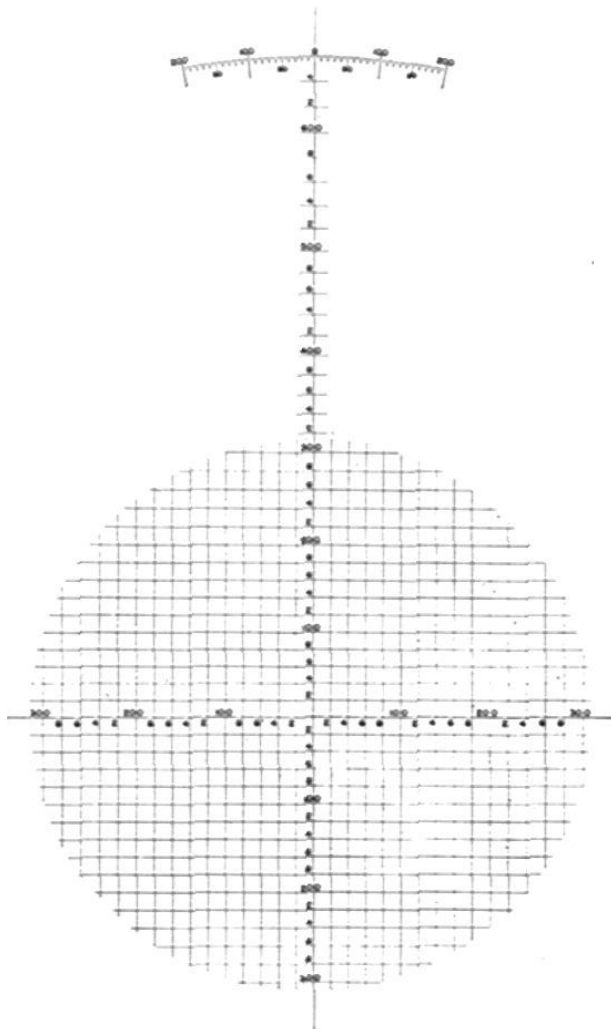


Figure 6—Plate grid (focal length 6 inches)

by extending the center line of the grid to the graduated arc with a straight edge. Tilt is read at the point where the horizon line strikes the graduated vertical line of the plate grid. The tilt read is subtracted from the standard (fixed) tilt (or vice versa) to find the deviation of the vertical camera from the true vertical. The plate grid is positioned over the vertical photograph and the dip and the difference in tilt plotted in the appropriate directions from the center. To determine the proper direction for this plot, the vertical is held so that the edge of the vertical which faces in the same direction as the oblique is at the top. Then, if the horizon is higher on the left edge of the oblique, the dip angle is plotted to the left of the center of the vertical. If the measured tilt is greater than the fixed tilt, the difference is plotted up (toward the oblique) from the center of the vertical. A pin prick is made to indicate the plumb point. The plumb point is then located on the ground by inspection and surveyed coordinates obtained for it.

To orient the center line an angle is read on the oblique to any point whose location is known on the firing chart,

preferably a distant one, and the center line is plotted from the plumb point by laying off the angle on the firing chart. For instance, if reading to the known point is left 365, a line is drawn through the plumb point so that it passes 365 mils right of the point. The simultaneous-vertical method is generally the most accurate for orientation of mil-gridded obliques.

Grid-line Method

In the grid-line method, no vertical photograph is required. Three points on the oblique photograph, of which the coordinates are known, are needed (see Fig. 7). These should be points which give good "sharp" readings, and it must be possible to occupy one of these points and from it see the other two. This point is occupied, an instrument is "zeroed" along the grid-line toward the plumb point by inspection of photo and ground detail, and the angles are read to the other two points. In each of the two triangles thus formed with the plumb point, the angle at the plumb point is read off the photograph. This gives two triangles with two angles and a length of side (from coordinates) in each. From these the length and azimuth of the line from the occupied point to the plumb point are calculated, and the coordinates of the plumb point are obtained. The coordinates of the plumb point thus obtained from the two triangles are averaged. The center line is oriented as in the simultaneous-vertical method.

Airplane-intersection Method

In the airplane-intersection method readings are made to the plane from two or more ground observation posts at the moment the photograph is taken. Control is maintained by radio between the plane and the observation posts and readings taken at the command of the photographer. The position of the plane and hence of the plumb point are calculated from the known positions of the observation posts. The center line is oriented as in the simultaneous-vertical system. This method is practicable only with the comparatively slow liaison type of airplane.

Resection Method

In the resection method three or more points of known location (preferably at least five) are chosen on the oblique photographs.

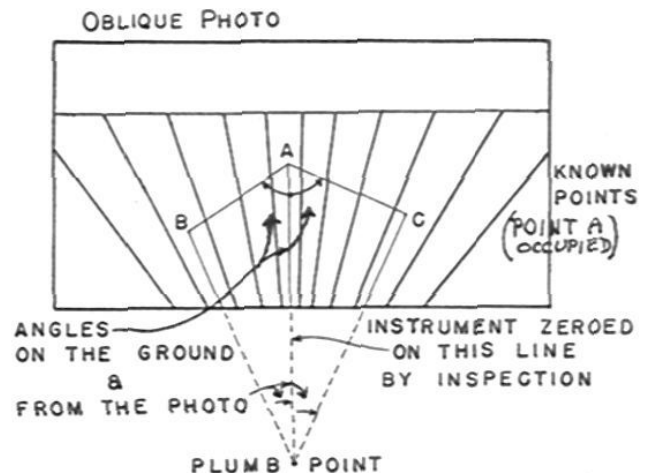


Figure 7—Grid-line method of locating plumb points

The angle to each of these points is read from the oblique grid. On tracing paper, lines are drawn to represent the center line and radial lines to the various points. The tracing paper is then oriented over the firing chart so that the lines pass through their corresponding points as in any tracing paper resection, the plumb point and a point on the center line are pricked through to the firing chart, and the center line is drawn. The points used should be well separated in range and direction. This method is generally least accurate and requires the largest amount of previous target area survey, but is the most rapid if the known points are already available.

LOCATION OF TARGETS

Targets are usually located by plotting as in the long-base intersection method. On the HCO-VCO charts or on a special chart provided for the purpose, the plumb points and center lines are plotted. As horizontal angles to the targets are read from the photographs, rays are drawn from two or more plumb points laying off the angles read. The intersection of the lines is the location of the target (see Fig. 8).

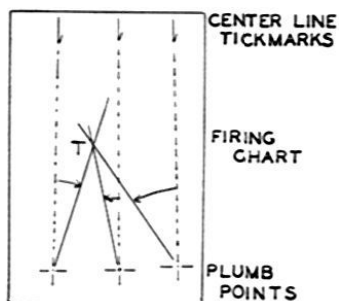


Figure 8—Target location with mil-gridded obliques

the horizontal angle given by the observer from the plumb point of his photograph and, by inspection of the photographs, obtain the horizontal angles to the same target from other plumb points and complete the location as described above.

DETERMINATION OF ALTITUDES

Altitudes are determined on the oblique photograph by means of the simple mil formula, $\phi = W/R$. A point of known altitude is located by intersection from two or more photographs. Using the vertical angle reading (ϕ) to this known point from any photograph and the range (R) to the known point from the plumb point, the difference in altitude (W) between the point and the camera position is calculated. Adding this difference to the altitude of the known point gives the altitude of the plane. For instance, if the altitude of a known point is 650 yards, the range to it 6,000, and the vertical angle 100 mils, the vertical distance is calculated to be 600 yards and the altitude of the plane is 1,050 yards (see Fig. 9). Using this altitude and reversing the procedure, the altitude of any target can be determined. The calculated vertical distance is subtracted from the altitude of the plane to give the altitude of the target.

Altitude determinations by this simple method will probably be in error because of slight rotation or vertical displacement of the grid. This poor placing of the grid is to be expected because of the difficulty in picking out the apparent horizon exactly,

because of ground haze, cloud forms, and so on. These errors can be eliminated by using three points of known altitude. The height of the plane is determined from each of these. The middle value is taken as the *effective camera altitude*. Supposing that the values obtained from three points of known altitude (D, E, and F) are 650, 630, and 660 yards, respectively,

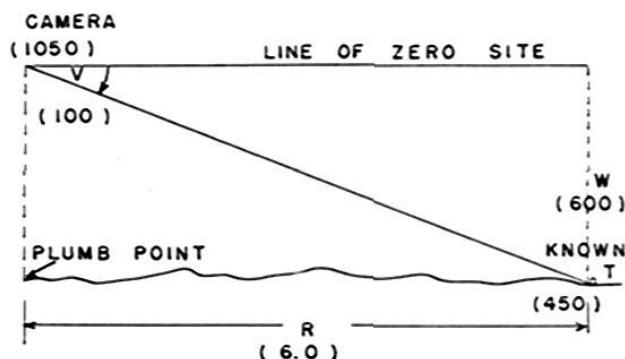


Figure 9—Altitude determination with mil-gridded obliques

650 is taken as the effective camera altitude. Then, on the firing chart, a line is drawn to indicate zero correction. This line would pass through point D and through a point 2/3 of the distance from E to F (2/3 because the correction for E is -20 yards and for F is +10 yards, hence the correction for this point would be zero). Then the altitude correction for any point is proportional to the distance of the point from this line of zero correction. A parallel line graph on tracing paper (see Fig. 10) will solve this proportionality quickly. Slide the cross line along the line of zero correction on the firing chart until the known point (e.g., E or F in above) falls on the appropriate correction reading. Then draw a line on the correction graph joining the known point and the center of the cross line.

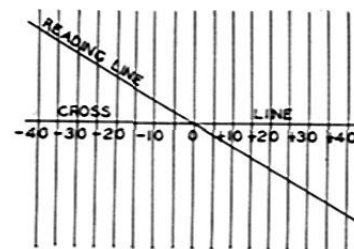


Figure 10—Correction graph for altitude determination

This is the *reading line*. By sliding the cross line of the graph along the zero correction line until the reading line passes through a given point, the altitude correction for that point can be read directly from the graph.

SPECIAL USES

Mil-gridded obliques are especially convenient for keeping track of patrols, forward observation parties, front lines, and other friendly installations. They can also be used for briefing patrols and observers and as panoramic sketches for the latter. They can be used in command liaison to choose and mark prearranged fires, normal barrages, and so on.

If a single oblique is taken with its plumb point in the immediate vicinity of the battery, a point visible on the oblique can be used as base point and base deflection shifts read directly. Approximate ranges can be obtained by using the base point range and vertical angle reading to calculate the altitude of the plane. Assuming all other points to be at the same elevation, an approximate range to any point may then be obtained

from the vertical angle to the point. The mil relation $R = W/\theta$ is used—where R is the range, W is the altitude of the plane found from the base point, and θ is the vertical angle reading from the oblique.

For rapid orientation of obliques without any survey, three or more check points are registered upon and plotted by observed fire methods, after stripping out site. These points are then used to resect the plumb points and center lines of the obliques. This method is comparable in accuracy to the observed fire chart.

CONSTRUCTION OF THE GRID

A knowledge of the construction of the grid is not necessary to its use. This information is included here for emergency purposes.

The first step in construction is to draw a horizontal line for the zero-site line and, perpendicular to it, a center line. At an arbitrary distance "K" below the horizontal line construct a line parallel to it (see Fig. 11). Complete the lateral distance along the zero-site line (Distance S) and along the construction line (Distance W) to a line (V) representing a horizontal angle (H).

This is done from the formulas: $S = f \tan H / \cos T$ and $W = S - (K \sin T \tan H)$ where "f" is the focal length of the camera and "T" is the assumed tilt of the camera.

To obtain the site lines, their intersections with the vertical grid are computed and smooth curves drawn through the plotted points. The intersection of site line "U" for vertical grid line "V" is a distance "J" below the line of zero site. The formula for "J" is

$$J = \frac{f}{\sin T \cos T (\cos H \cot D \cot T + 1)}$$

where "D" is the angle of site represented by the line "U." The grid drawing is best accomplished at an enlarged scale and photographed down to the desired size, making contact prints on transparent positive film.

From the formulas for S and W, it is fairly simple to calculate the errors due to small differences between the focal length and tilt of the camera used and those for which the grid was constructed. For instance, suppose that the grid was constructed for a focal length of six inches while the camera has an actual length of 6.1 inches. Assume the tilt in both cases was 533 mils. The error in a reading of 300 mils can then be found by calculating S at $f = 6$, $H = 300$, $T = 533$, and (using this value for S and $f = 6.1$) calculating H. Thus, $S = 6 \tan 300 / \cos T$ and $\tan H$ (corrected) = $S \cos T / 6.1 = 6 \tan 300 / 6.1$, or $\tan 300 / \tan H$ (corrected) = $6.1 / 6$. The correct value for H then is 295 mils, indicating an error of 5 mils. This value is found at several points and a graph constructed to give directly the error at any point. Similar calculations can be performed for errors in tilt assuming f as a constant.

ACCURACY OF METHOD

Experiments and tests on the location of targets by means of

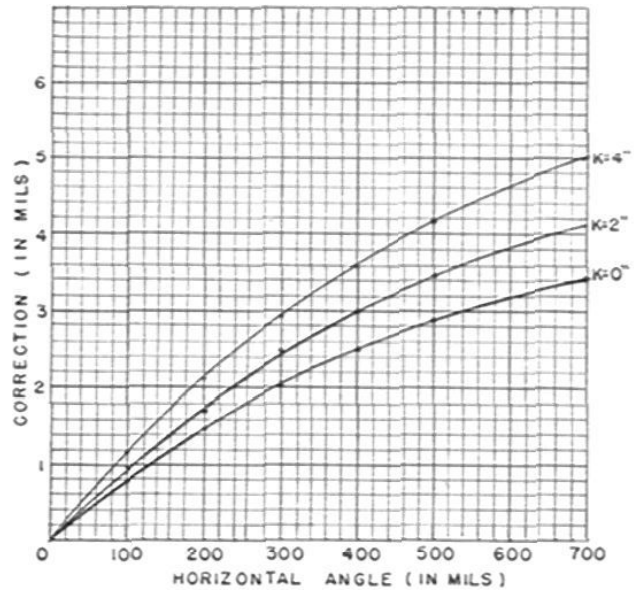


Figure 12—Correction graph for difference in focal length

mil-gridded oblique photographs have indicated that the magnitude of errors to be expected depends on several things. Of these, length of base between plumb points and the range to the target are the most important. Other factors are the focal length of the camera, which determines the "scale" of the photo, and the fineness of the printing and gridding work in the photographic laboratory.

In general, with six-inch focal length obliques, at ranges from 5,000-10,000 yards, using a base of 3,000 yards, an average error of 40 yards with a maximum error of 100 yards can be expected for horizontal control. For vertical control, using three points and the graphical corrector the average error will be about 5 yards with a maximum error of 15 yards. Use of a 12-inch focal length should decrease these errors.

These errors may be reduced somewhat by using two possible refinements to the readings taken from the photographs.

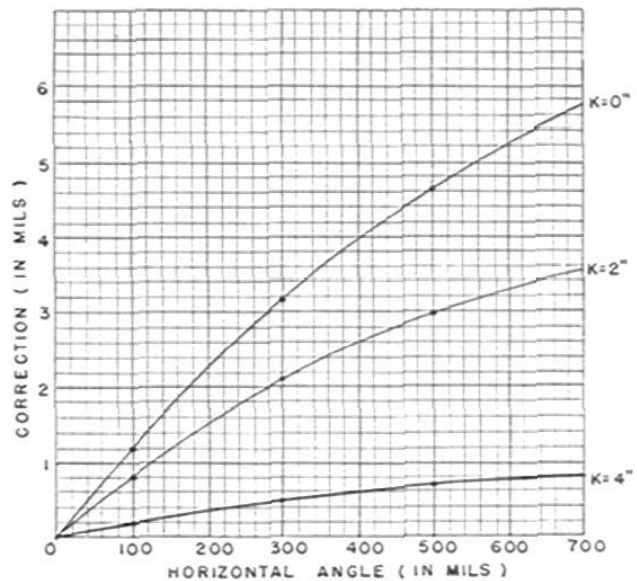


Figure 13—Correction graph for difference in tilt

There are two sources of small errors which can be eliminated mathematically. The first of these is the difference between the actual focal length of the camera used and the focal length which was assumed in constructing the grid. (For instance, a camera of so-called 6-inch focal length may actually have a focal length of 6.1 inches.) To correct for this, errors are calculated at varying horizontal angles and varying distances below the horizon line and a graph constructed which reads corrections directly (see Fig 12). The correction is applied to the horizontal angle read for each target. The method of calculation is described above in the section on grid construction.

The other source of error is the difference between the actual tilt of the camera when the photo was taken and the tilt

used in constructing the grid used. Here again, errors are calculated for various points and a graph constructed which reads corrections directly (see Fig. 13). The calculation of errors is described in the section on grid construction. Supposing that grids are constructed for every 40^m of tilt, then a graph may be constructed showing errors due to a 20-mil difference in tilt, as this is the maximum possible deviation when the best available grid is used. If the difference between the tilt of the photograph and that of the grid is less than 20 mils, a proportionate part of the correction may be used.

It must be noted that these corrections are not necessary—they merely *improve* the results obtained. In general, a 20-30% decrease in error can be expected with their use.

SHORT-NOTICE COMBAT

By M/Sgt. Edmond W. Seward, FA

I learned right off the bat that in my job (Communications Chief of Headquarters Battery, 29th Division Artillery) the only thing I could expect was the unexpected. From our D-day landing in Normandy, through the battle for St. Lo, the breakthrough, the follow-up down to Vire, and then out on the Brittany Peninsula in the fight for Brest, I've been impressed by the fact that you can't afford to let your guard drop for a moment.

A small incident to illustrate my point, an incident which is hardly worth mentioning beside the tales I know any one of our doughboys could tell.

With Capt. Thomas C. Johnson I had been out on reconnaissance for a new DivArty CP in the vicinity of Villers Fossard, north of St. Lo. It was strictly routine stuff; we moved CPs so many times in those first few days after the landing that another displacement and another recon meant hardly more than digging another foxhole. Capt. Johnson had picked the new position and we were on the way back to the old CP, intending to intercept the wire truck on its way down and direct it to the forward switchboard. I had a pretty fair idea where the front lines were supposed to be, and I knew that the new position was well up forward. But I wasn't thinking about Jerries—at least not in personal terms—at the moment.

300 yards up the road ahead of us a man ran from the hedgerow on the left across to the hedgerow on the right. Cpl. James Griffin, sitting beside me in the back seat of the jeep, said "It's a German!" I had seen the man clearly. He was bareheaded and I recognized the field-gray color of his uniform, but it didn't quite register. It seemed too unlikely that there should be a loose Nazi so far behind our lines.

Unlikely or not, we hit the ditches on both sides of the road without losing any time.

The captain told us to open fire. As soon as we did a second German popped out into the middle of the road, and there wasn't any doubt about him. He wore his helmet, black boots, and all, just like the identification pictures in the orderly room. The odd thing about him was that instead of taking cover he stood smack in the middle of the road, waving his arms and jumping up and down. I fired six rounds at him with my carbine, missing them all; I figure it was because I wasn't sure enough of my "Kentucky windage" at the range. The captain couldn't do anything with his pistol at that range, of course, but our driver and Griffin let go with their carbines from pretty good positions behind the hedgerow. If we scored any hits we never found out about it.

But we did find out why the fellow jumped around in the middle of the road. He was giving his pals time to set up a mortar and a light machine gun. When they were ready they let go with tracers, straight down the road and into the radiator of the jeep, like bowling down an alley. And right on top of that the mortars came down, a little off for deflection but good enough.

"Let's get out of here," the captain said. Nobody disagreed. I'll never forget crawling over the top of the hedgerow on the way out, with those tracers singing by. My pistol holster caught in a bush or on a wire just at the critical moment, and there I stuck—probably not more than half a second, but it seemed as long as it's been since I last saw Richmond.

That was all. We got out all right, but minus a good jeep. And ever since, when I set out with the captain on reconnaissance, we carry with us two (2) Tommy guns and an '03 Springfield, just in case the unexpected shows up.

FOR SERV BTRY COMDRS

By observing the practice of keeping the service element snubbed up to the battalion and having each battery draw its own gas, water, and rations, it is not necessary to "rob Peter to pay Paul" on vehicles.

—Capt. R. C. F., Italy

In Combat Forewarned Is Forearmed

By Lt.-Col. G. D. W. Court,
M.C., R.A.

COMMAND RECONNAISSANCE

These remarks apply to all officers about to conduct personal reconnaissance, but they are designed primarily for Platoon Commanders and Company Commanders. So often one sees a young lieutenant who has just received his orders jump into his jeep and tear off "like a bat out of hell." No doubt he is thinking, "I must get on with my reconnaissance, to ——— with all else!" This of course is all wrong. This lieutenant has no idea *how* he is going to conduct his reconnaissance, he has not fully digested the information given him, he is probably not at all clear as to his precise mission, undoubtedly he has forgotten to look at his watch and decide just how long he has in which to carry out his reconnaissance. Altogether, he is not likely to do a very good job.

Although there is always more than one way in which to carry out any mission efficiently, the following is one method which has been proved time and again in combat. However short your time may be, you will always (in fact you *must* always) have time to *think* and make a *plan* before you can do anything.

Therefore, first consider your position. Orient yourself on the ground with reference to the map. Make sure that you know the right and the left of the area; also, how far forward you can go and how far back. Bear in mind the location of local infantry dispositions which have been given to you, and at the same time remember to keep a sharp lookout for further friendly infantry dispositions as you conduct your reconnaissance. You are now about to reconnoiter the area assigned to you in far greater detail than it was possible for your superior officer to do (for he had several areas of the size of yours to reconnoiter), and it is therefore quite possible, in fact it is highly probable, that you will be finding out some things which are at present unknown to him.

If you are in fairly open country and there is doubt in your mind as to the length of the frontage or the depth of your position, it is often helpful to measure off the distance by the odometer in your jeep. It is extraordinary how often this helpful little instrument is forgotten! And while on the subject of reconaissance, a commander must ensure that sooner or later the entire area is covered in reconaissance by either himself or a deputy. I well remember an instance in the Battle of France in 1940; at the time I was commanding a troop (U. S. platoon). I omitted to cover my entire frontage by personal reconaissance, as I considered that I could see to the end of



Outposts should have protection and concealment. This AT gun is well equipped with both, even to overhead cover to keep falling bricks off the crew.

the area and to the line of demarcation upon which my troop linked up with my neighbor. Had I taken the trouble to check I would have found out, before it was too late, that there was a sunken road running at right angles to my front which could be entered by enemy tanks completely unobserved, and with the din of battle those tanks would be completely unheard also. This sunken road led right through the battery position and around to the rear of the area. Don't get caught like that.

Some units are in the habit of marking gun positions with prominent flags, metal stakes, etc. Speaking just for myself, I am not altogether in favor of this. Gun commanders soon come to rely on these marks—then when they have to occupy a position where there is no stake they are apt to be confused. Also, stakes are undesirable if the positions to be occupied are under enemy observation. On the other hand, during training it is very sound to mark the spot on the ground over which the sight must come, to ensure that the piece is sited with due regard for flash defilade for the direct fire weapon; this has particular reference to antitank guns and tank destroyers.

A question cropped up a little while ago under the following circumstances. A lieutenant asked what he should do if, in order to complete his reconnaissance, he would be late at a rendezvous. Was he to turn up at the rendezvous late, having finished his reconnaissance, or was he to turn up at the rendezvous on time, having failed to complete the reconnaissance? This may seem a simple point, but it is just those simple little points which are apt to upset people going into combat for the first time. (Remember, in combat, it is often surprisingly difficult to accomplish the simplest of missions.) The answer, to my mind, was purely logical. If this rendezvous is with an officer senior to yourself, then you *must not* keep him waiting (by so doing, you may well be ultimately holding up the Commanding General). If, however, your rendezvous is with personnel junior to yourself, then you are the sole arbiter and must of necessity know the consequences of keeping them waiting, if in your opinion this is justified; it is a right and proper decision for you to make.

A mistake which is often made by even senior commanders is the formation of a "bitch in heat party." This is the only way I know in which to describe the commander driving around the area on reconaissance with all his subordinate commanders strung out in a long line behind him. There is nothing on the battlefield which can so easily give away our

Whilst written with particular reference to Tank Destroyers and Infantry Antitank, these remarks are applicable to all arms.—G. D. W. C.

intentions to the enemy, and we all know how good he is at accurate and constant observation—not to mention the production of speedy and equally accurate fire! If you cannot locate a good gun position in the assigned area, move 50 to 100 yards in any direction and you will then probably be able to choose a good position. Similarly, if you are unable to decide on a general platoon plan, then visualize a square or flat-diamond on the ground and again you will probably have the answer.

TACTICAL AND ADMINISTRATIVE ORDERS

The lieutenant referred to previously who omitted to make a plan before starting his command reconnaissance is generally the sort of officer who doesn't give orders efficiently. There is definitely a right and a wrong way in which to give orders, and even under the most strained conditions these points are applicable. Whilst not suggesting for a moment that you, about to give orders, should spend considerable time in finding a nice comfortable spot in which to give them, at the same time it is always worth while spending a minute or a minute and a half in getting off to the side of the road. You might be able to find a wooded spot or a shady tree (not an isolated one!), or you might be able to get along the side of the hedgerow—but wherever it is, take a minute in choosing the best immediate location. Of course, avoid what is often called a "focal point"—a terrain feature. It is essential for every word of the orders to be got over to the subordinates, and if they are not in a position to hear all you say, take it down, note it on the map, understand it, and above all remember it, then you are wasting your time and you might as well go home. By this I mean that those receiving the orders, as well as the officer giving them, must be as comfortable as the situation permits.

Appoint a non-com to keep transport away from the scene of the order-giving. Let your subordinates relax, and to a large extent relax yourself. Where possible, ensure that each of your subordinates has his executive with him (whether they are company or platoon officers). A good plan is for the executive to note the important points in his book whilst the senior member of the pair studies and marks his map as the orders progress. This would be done by the Company Commander and his Executive, or by the Platoon Commander and his Platoon Sergeant. Having a second person at the order-giving is a valuable check (and this is meant in a constructive manner) on the senior of the two officers concerned. In combat no one man can keep going continually 24 hours a day, day in and day out. A Battalion Commander and his Executive form a two-man team, so does the Company Commander with his Executive, and so do the Platoon Commander and his Platoon Sergeant. Each should know as much about the tactical and administrative situation as the other, and whereas both should, where possible, be present for the order-giving relative to a new phase, thereafter it is quite common for the executive to receive orders on behalf of his commander. No sensible senior officer will take exception to this practice unless the situation is an extremely important one, in which case both members of the team should be present.

Whether in combat or out, every officer and every enlisted man in a responsible position (e.g., at least down to gun commanders) must always have in his pocket a notebook and pencil. It is not good continually relying on one's memory. One is only human! It is wise to make a rule that whenever a

subordinate is told to do anything he should make a note in his book at once, unless it is something small which he is to perform at that very instant. As a unit commander I used to stop any officer of mine, every now and then, and ask him to show me his notebook, and often in the early days of training I would call in *all* the officers' notebooks and go through them to make sure they were keeping them. If I had a conference and an officer or a senior NCO had not brought his book, he was forthwith sent away to get it; the conference went on, and it was up to that officer or NCO to find out at a later time the details which he had missed through his negligence.

As a unit commander I found it necessary to divide my own notebook into sections—a page for each of my captains, one for the headquarters lieutenant, another for my sergeant major, a page for the quartermaster, one for the automotive mechanics, and so on. This may all seem to be much ado about nothing, but attention to detail will either win or lose battles—as has often been stated by many commanders, not the least of whom is Field Marshal Montgomery.

One last word on orders—a subordinate must know the headings and sub-headings of the orders being given to him so that if his superior omits any point, then he can immediately inform him. A sensible leader will welcome such a check and will not regard it as a reflection on his character that it is necessary for subordinates to check on him.

I used to make it a rule that even the most unintelligent members of the unit should always not only know the answers to the following questions, but furthermore should always remember to ask and to go on asking until they were told:

1. *Where* are the enemy?
2. *Where* are we going in order to hit the enemy?
3. *How long* have we got?

TANK DESTROYERS AND ANTITANK GUNS

How often has one seen a self-propelled tank destroyer in a good hull defilade position, with good camouflage and attention paid to all the prime requisites—until one casts one's eyes heavenward, whereupon he sees the .50-cal. machine gun sticking straight up in the air? On one occasion (admittedly not in combat) I saw a steel helmet sitting on top of it. The same remarks apply to the radio aerial. Comment here is unnecessary, but it is a mistake which is so often made that it is worthy of mention.

With all forms of towed antitank guns in a static position, personnel should live about fifty yards away from the gun pit, defiladed from the enemy, not occupying the pit until alerted. A forward observer must of course be constantly posted in the vicinity of the gun, observing the terrain. Movement often gives away otherwise good positions; attention to this point is so important, yet so often it is ignored by troops in training. With self-propelled destroyers, of course, the problem is more difficult, but none the less urgent. *There must be no movement whatsoever around a gun in action, emplaced or not—and this goes for Field Artillery, too.*

Nightly checking of camouflage and hourly attention to track discipline are two of the things often neglected in training and much neglected in the early stages of the Normandy invasion. A problem which often confronts the man new to combat is when and when not to move on being shelled. The answer, of course, depends in every case on the tactical situation and on the intensity of shelling, but the fact remains that a gun which moves every time it is shelled is going to spend

all its time moving, and moving guns get knocked out more easily than emplaced guns. Just remember that merely because a shell comes over does not necessarily mean that it was meant for you. The German is a creature of habit. That bit of shelling might well have been something which he does every hour during the day. Alternatively, it might be shelling meant for somebody else, and even if it is meant for you, remember that a dug-in gun can take a terrific amount of shelling without damage. A self-propelled gun for which there has been no opportunity to dig a pit must move every few minutes and will often remain comparatively immune from shell fire. (This last remark is made with particular reference to a self-propelled destroyer which has just taken over from the armor and is holding an objective from hull-down positions until the arrival of the infantry antitank.)

It is essential to open up on German tanks with small arms fire (preferably light machine gun) in order to make them close down. Therefore some machine guns must be sited for that purpose, and also in an anti-infantry role.

None of the above points is radically new, but however small they are all very important from the point of view of success in combat. This has been proved in the 1940 Battle of France and Belgium, in the Eighth Army campaign in the Western desert, and Tunisia. And these points are being stressed even now in combat reports from the European Theater.

"Read, mark, learn, and inwardly digest"—this was true when it was written a long time ago, and it is just as true now.

WITH 8" GUNS IN BELGIUM

By Lt. Col. Arthur W. Blair, FA

ABOUT THE AUTHOR

Lt. Col. Blair commanded a battalion of 8-inch guns in France, Belgium, and Germany. He was killed in action in Germany, on Christmas Day, 1944. This article is extracted from a letter he sent shortly before then, to Lt. Col. Charles P. Westpheling, FA.

All occupations are quite deliberate, and with our present air superiority are made in broad daylight. Would that reconnaissance could be as deliberate! So far we've had no prior indication of where we would move next or when, and with the ever-short hours of daylight our recons have had to be very rapid. We try to find positions offering defilade from ground observation, of course. If we can find positions which will diffuse our flash and smoke before they break defilade, we feel that we are quite fortunate. Also, we try to find positions near hard-surface roads to facilitate ammunition resupply, and convenient to buildings of any sort, size, or condition for comfort of the men.

Camouflage is emphasized but has proven easier of accomplishment than we had thought it would.

We have used all types and sizes of gun positions—orchards, sand-pits, quarries, open meadows, railroad yards, city streets, etc.—in other words, any place we can get into and from which we can accomplish the mission. Consistency of the soil deserves much consideration. Test holes must be dug. Subsurface water can double the work of the gun crews by requiring almost constant baling of the recoil pit. Shale or rock is often found under apparent meadowlands. When we find hard clay, we can congratulate ourselves: it holds better than any other type of soil.

Our prime-movers—we have the M-6—have not failed us yet. We do find some difficulty, though, in turning sharply on wet grass or slick mud (and it doesn't have to be deep mud) with a full load. Removable cleats for the tracks would be a godsend.

Our cranes have served us well, but the contrary old things have to be towed or winched whenever they get in slick or soft ground. They have no traction or flotation worth mentioning. So far we've not found it necessary to use the clamshell, finding that elbow grease and pick and shovel work just as well.

We do not use the 3d Section tractors for resupply. They use too much gas, are too slow, and take up too much road space. Instead, we use extra issue trucks.

On fire direction procedure I can hit the high spots only. First and primarily, remember the basic principles of gunnery. But don't apply them blindly to this big stuff.

We use a computer for each gun and handle each gun separately. When time permits (and it usually does) we compute map range and map shift and measure only as a check against huge error. We do not use the HCO and VCO as such, but have made computers of them; the S-3 or assistant S-3 performs their normal duties. All corrections are computed as accurately as possible, to the nearest tenth mil—yes, even deflection. With our ranges one mil in deflection means a lot of yards on the ground. MIFMIFs arrive every two hours and we interpolate within the messages, particularly for density. We have been trying to get the OBs to give us density to the nearest tenth in the message, but they claim that would upset their and other artillery procedure and require too much reeducation of telephone and radio operators. Very accurate records are kept of our full service rounds fired; we then correct for erosion effects after each mission.

Registrations have been few and far between. Cubs and ground OPs have been more successful than high-performance aircraft; our burst is evidently so small that the fast observers cannot pick it up. In spite of the lack of registration, however, every single one of our observed concentrations has been effective. High burst has been equally unsuccessful. Good OPs are hard to come by, except for short range stuff, but we do usually manage to find a satisfactory one.

What I have said above applies only to how we operate in this battalion, but the other big ones do generally much the same. But in spite of all I've said above, if your students will thoroughly know and understand their basic artillery principles of Fire Direction and Operations and be flexible enough to vary them with the materiel and situation at hand, knowing when to elaborate and when to simplify, they'll get along whether pulling the string on pack howitzers or Big Berthas.

In France . . .

After 18 months of strenuous training on the wind- and rain-swept moors of England and at the Assault Training Center, our unit was to receive the chance to play the big game against our biggest and toughest opponent on his home grounds. We had trained hard and long and had grown weary of the many dry runs we made but above all we were anxious to match our methods and tactics against those of the German Army. I, for one, wanted to prove to myself that every little detail we had stressed so hard in training was important enough to make for a better functioning unit.

From the moment we hit the beach on D+1, through the campaigns of Normandy, Brittany, and the present battles for the Siegfried Line, this training has justified itself many times over. Our field artillery gunnery methods and tactics have beaten the Germans at every turn and have played a tremendous part in the tactical achievements accomplished by our infantry in this phase of the greatest of all wars.

DIGGING IN

We have proved to ourselves that digging the howitzer deep in every position is absolutely essential for the safety of personnel and equipment. I remember while on training problems the many times we'd ask the battalion commander if it was necessary to dig, and then complain when the answer was always "yes."

Now we drop trails in a new position and immediately the men begin the tedious task of digging. They never stop to rest until the gun is completely dug in and their own trenches, with overhead cover, are complete. Issue sandbags are filled and used to form a sandbagged parapet around the howitzer sections. After four months of combat excavation the men have only one complaint—there are not enough shovels and picks in the T/E.

We rapidly found too that it pays dividends to dig a large pit to allow for large shifts of the trails to the right and left. After laying the battery on a particular compass or base angle in the center of the target area, situations have arisen where we have had to shift as much as 2,000 mils right and left. If the pit had not been dug properly at the start, it would have taken too much time to prepare it for the shift and thus resulted in a prolonged delay in the delivery of important fire.

On one occasion in the Brest Campaign, we went into position and fired for two days around compass 4700 and then, at the end of hostilities in that sector, turned the guns around and fired in the neighborhood of compass 1600 for the next five days. Such a situation is uncommon and only happened to our unit once but it can happen again and we are prepared to meet the eventuality.

HEDGEROWS

In Normandy and Brittany we used the well-known hedgerow to advantage. This four to six feet thickness of well-packed dirt gave us natural protection on one and in some cases two sides for our howitzer pits. Shooting through these hedgerows also gave us added defilade and helped to conceal the muzzle blast of our howitzers. We found it was an easy

. . . With 105s

By Capt. Harry R. Ostler, FA

problem to blend our camouflage with the surrounding terrain. Track discipline within the battery position was simplified.

A comparison of the gun positions we used in France with those we now occupy in Holland shows that we use a much greater area for our battery installations in the present campaign. In France our installations were compact because of the natural cover and concealment prevalent, and also for security reasons against snipers and enemy patrols. In Holland the country is wide open with little or no foliage at all except for some isolated patches of thick pine forests. To meet this contingency we now spread our installations over a much greater area, which necessitates more extensive security.

SECURITY AND CAMOUFLAGE

In regards to security of the position area, we have found that guards should be posted in pairs. This method gives coverage to each guard and tends to release the tension of fear and aloneness which prevails at night in hostile territory. In the beginning, just after we left the beach, we used roving guards. This proved unsatisfactory because our guards were continually challenging each other and the noise of their movement tended to reveal their position. A pair of sentinels dug in and stationary has proved to be the best security.

Superior camouflage and a minimum of movement around the battery position are necessary, more so at night than during the day. Our unchallenged air force in daylight allows us freedom of movement. At night, however, German planes venture out and at times drop flares which light up the area and tend to bring out the unnatural from the natural. On such occasions carefully planned and well executed camouflage discipline is the difference between life and death.

COMMUNICATIONS

We have laid wire whenever possible and have found that



Laying wire among the hedgerows near St. Lo.

it is better to follow the roads rather than lay across country. Wire communication is established quicker this way, but the deciding factor in all instances has been the fact that many entrances and fields have been mined by the Germans. To avoid casualties and to establish wire communications rapidly, follow the road net. In fast-moving situations we have used nothing but radios for communications. At times the forward observers have moved so rapidly and far that laying wire was impractical. In certain phases of our campaigns we moved our battery forward daily for as many as seven days. Under these conditions laying wire to forward elements was impossible. But wire laying within the battery and battalion was and always will be first priority on the list of a wire crew in a displacement.

MAINTENANCE

Of great importance in the field is first echelon maintenance. Vehicles and weapons must be in first-class shape at all times. This has proven 100% necessary because you cannot foresee when the next move will come or how long a move it will be. We have made some very long moves, and without good first echelon we would never have reached our destination intact.

BATTERY PERSONNEL

Flexibility during these four months has proven to be the watchword in the functioning of my battery. Chiefs of sections,

gunner corporals, and cannoneers know each others' duties and are interchangeable at any time. In my battery I have had a chief of section or gunner corporal in the executive's post at all times, learning the duties of an executive of a firing battery. This plan proved its worth. I lost six forward observers through casualties and transfers since entering combat. Thus it became necessary to use my executive officer as a forward observer. My staff chief of section with the help of the three other chiefs and the four gunner corporals have run the firing battery by themselves. These eight men plus three recorders are able to lay the battery, compute changes in commands, and carry out the intricate duties of an executive without the slightest hesitation. At the present time the three officers in my battery are used as forward observers. Through the excellent work of the non-coms the efficiency of the battery has improved steadily.

This flexibility of training has proven essential in all departments. During the Normandy campaign the NCO members of the forward observers' parties proved themselves. At one time for twelve days I was the only officer in the battery, with no officers available to me. During this period my NCOs took charge of the forward observer parties and worked with the infantry like veteran observers. The excellent work of these men enabled our battery and the battalion as a whole to carry on its mission without the loss of any efficiency.

...With Mediums

By Lt. Col. Frank W. Norris, FA

Our unit (the medium artillery battalion of the 90th Div Arty) was not in North Africa, it was not in Sicily, and it was not in Italy. Our zone of action has been solely France, but we did hit Utah Beach on D+2. Thus, we have been involved in the following types of action: an amphibious landing; the drive through the hedgerows to cut off the Cotentin Peninsula; a defensive action at the base of the Peninsula while Cherbourg was captured; then more hedgerow work east of La Haye du Puits until the big breakthrough at Coutances; next the encircling action of the Mayenne—Le Mans—Alençon run to close the Falaise gap (it wasn't a pursuit because we were in rear of the enemy all the time); then the advance against light delaying forces to Metz and

the Moselle; the attack of a strongly defended town (Maizieres-les-Metz); the forcing of a crossing of the Moselle; and finally our move to the Saar. Each of these actions can be arbitrarily classified as to type. Each of them, however, varies to a greater or lesser degree from what we expected according to the book. I think an infantry battalion commander expressed this characteristic perfectly while I was visiting him at his CP in the best cellar in Maizieres-les-Metz. He said to me, "You know, this fighting in cities is really funny stuff." Then he thought a moment, smiled fleetingly, and said, "I have been fighting for five months now and I still am looking for that 'normal' situation." We both agree that he will never find it.

LANDING

Our amphibious landing was an interesting and successful experience. All violent resistance had ceased when our turn came and only an occasional round was falling in the area. Had the situation been otherwise, the landing might have been much more interesting and considerably less successful. We found the standard waterproofing system to be absolutely OK; if the drivers follow instructions the vehicles won't stall. Our greatest problem was in making the driver overcome his natural tendency to take his foot off the accelerator as his vehicle hit the water. Whip that tendency, and your landing will come off well. Before hitting the ramp be sure you tie down everything that floats and some things which don't. The English Channel was littered with gas masks, musette bags, map cases, etc.—each jeep that hit the water left some souvenir on top.

As for things that don't float, I mean such things as the spades of the 155 How M1. I realize that they weigh 184 pounds apiece and are securely fastened to the trails by brackets. But I also know that when we occupied our first position near St. Mere-Eglise, seven of our spades were resting

AUTHOR'S NOTE

In a recent issue of our Journal I note a request that units involved in this tangle in Western Europe give any hints, suggestions, comments, or lessons derived from their work here. Well, these are mine. I realize that any combat experience, however varied, can add little to the splendid fund of information available in our field manuals and other training literature. Nevertheless, there is a recognized educational phenomenon which may make these comments worthwhile. The phenomenon is that officers read and reread sound tactical doctrines and fine points of technique in our FMs, yet they often fail to grasp the importance of what they have read. If, however, they see exactly the same information presented under the heading "Combat Experiences," they immediately take notice and say to themselves, "What a valuable pointer that is—my outfit must start doing that immediately."

This is written in the hope that these notes may serve to emphasize or elaborate upon some of these fundamentals. In order to orient the reader and give him a basis on which to judge what he reads, I will briefly outline my unit's actions in France. Then our actions will be discussed.

on the sand under four feet of water. The sea rushed up and neatly lifted them from the brackets as the piece hit the water. We recovered four of them at low tide and my enterprising motor officer made the rest out of a defunct Jerry tank, so the shooting did not suffer unduly. Tie them on, however—you might not be able to find another tank.

My last comment on the amphibious landing is the very common-sense one—don't unless absolutely necessary, hit the ramp until the tide is giving you at least an even break. Some units, under the impetus of their desire to get at the Heinie right away, tried to beat Father Neptune. Their jeeps drove off the ramp into the water, disappeared, and all that reappeared was a great big bubble—plus more than the usual number of souvenirs.

MARCHING

Any unit which is equipped with the M5 tractor for prime-movers has no real marching problem. As far as physical movement of the pieces is concerned, we are agreed that the finest article of equipment in the U. S. Army is the M1 Howitzer and the second best is the M5 tractor. Yes, we know it makes noise on hard roads and blows a bogie occasionally, but we rapidly forget these defects when we see it take the M1 into and out of positions which jeeps can't negotiate. It is absolutely indispensable in bad going, particularly mud. At times we lend a tractor per battery to the light battalions if they are in a bad mud area so they can get their pieces out to hard standing. The 105 is a breeze for the M5, and use of the M5 prevents a lot of wear and tear on the GMCs. Yet another secondary use of the M5 is the fording of streams which are impassable to ordinary vehicles. That 52-inch wading depth may literally be a life saver at times. For instance, in our recent crossing of the Moselle the approaches to the ponton bridge were flooded to a depth of 4½ feet. Our M5s took 7-ton trailers right through and furnished the only major supply means to the bridgehead at a crucial period of the operation.

The necessity for rapid displacements in muddy terrain has given rise to one innovation in our battalion's march technique. This mud, which honestly is worse than Louisiana's, makes "close station, march order" a slow process for the Diamond Ts and GMCs. Worse yet, these vehicles may get stuck and block the road if, as is usually the case, the battalion is using only one route into position. The M5s and lighter vehicles can generally get into 'most any position, so we are trying a march system which shows considerable promise. We march what may be called the essential shooting vehicles at the head of the battalion column. These vehicles are—in the firing batteries—a command car or jeep for the Ex., the prime-movers, and the 5th section (less T's if stuck); in Hq Btry, the CP truck and a radio vehicle. (Wire, of course, has gone in with the reconnaissance.) Thus, in a compact, maneuverable group, we have that part of the battalion required for immediate delivery of fire. The rest of the vehicles come up later as they are extracted from the mud; we may leave an M5 back to help in this operation. The route is always marked, so no battery is required to wait around for a couple of hours while a particularly obdurate vehicle is extracted. As for the AA, we march the half-tracks (with the M51 mount) in the shooting vehicles' column; the 40-mm plus the ground mount .50 cal. come along with the remainder of the battalion.

The position of Serv Btry in a march column or in a battalion area is always a moot question. Many battalions keep

their service battery right with them; others keep it to the rear. As for me, I agree with the latter school. As long as Serv Btry does not get to the rear of the supply agencies, the farther back it stays the better. There is less congestion and more safety in such an arrangement. Also, I do not feel that the service battery should displace each time the remainder of the battalion does—they can't perform 6,000-mile inspections on the run. Whenever possible, let your Serv Btry BC pick his own area and make his own displacement—he will be happier and your battalion will be better supplied and maintained.

In combat, almost all of our displacements have been in daylight. Our air superiority has made them actually safer than night displacements, for the Jerry planes usually appear only under cover of darkness. We were strafed in daylight just once: four Me-109s hit our column, only two of them got away from our AA battery's M51s. One cardinal advantage of the daylight displacement is the fact that it permits the batteries to get dug in and organized prior to darkness. Another is the fact that our liaison planes keep the Jerry artillery well subdued during daylight, but he usually can be depended upon for some interdiction of key cross-roads at night so it's safer not to be traveling then. Despite the prevalence of daylight displacements, I feel that the stress placed on night marching during our maneuvers is as it should be. If you can do it at night in training, it's twice as easy in daylight in combat.

SHOOTING

Firing Battery Technique

And now for some comments on shooting. In firing battery technique, we still have not managed to improve on Burger and Handy. Who has? There is, however, one point which must be realized. That gun-park position area with 20 yards between pieces, which permitted such close supervision by the executive, does not exist in combat. A round trip from the executive's post to each piece and back again in any normal combat position involves a jaunt of from 300 to 600 yards. Each of my executives is a big strong boy who drinks his lemon powder daily, but after one trip around that muddy track in combat suit plus overshoes he is a true case of combat fatigue. It is obviously impossible for any executive to make the close visual check usually required of him during training, so we must depend upon the accuracy of the chiefs of sections and gunners plus frequent verbal checks by telephone.

We make no attempt to designate a standard formation for the pieces in a battery front—each position is unique and demands its own solution on the part of the battery commander. We do insist that the battery front be not less than 200 yards and that the pieces be dispersed in depth. No other conditions are laid down. When possible, we like to have No. 2 the rearmost piece of the battery so that all pieces should shoot beyond the registering piece if close-in fires are required before individual piece corrections can be applied.

The necessity for making many wide deflection shifts, with the consequent displacement of aiming stakes, has made our gunners strong advocates of the distant aiming point. A trick of nomenclature which may help to make your gunners conscious of the advantages of the distant aiming point is this. Most units, I believe, call the distant aiming point an "auxiliary aiming point" and the aiming stakes are called the "aiming point." Instead of this, reverse the nomenclature and make the distant aiming point the "aiming point." That nomenclature places the emphasis where it belongs. Whenever possible

we line in the aiming stakes with the aiming point as such a procedure saves carrying two base deflections.

Wire is always laid from the executive's post to each piece, and we have salvaged enough 536s in some batteries to give us radio from Ex to the pieces. This wire comes in very handy on occasions. For instance, on dark night about a week ago, 18 Jerries slipped out of a large woods near the No. 1 piece of Baker Btry and started across the area. The chief of section saw them as soon as they left the woods but wisely decided to wait until they got to the middle of the area before opening fire. He alerted each of the other sections by phone, and at his signal the Heinies received a warm welcome. Eight of them got away—as far as Charlie Btry, which gathered them in as they crossed a little bridge between the two batteries. I am not sure exactly how this episode figures in a discussion of firing battery technique, but it was a neat job anyway.

Each firing battery maintains its own FDC with the latest data available. They work their own metros and maintain their own chart. So far our battalion FDC has carried its own rabbit's foot so the tactical necessity for the use of a btry FDC has not appeared. I hope it never does, but it is a comfort to feel that the batteries can carry on if battalion is knocked out.

Medium Artillery Observer

I am including the discussion of the employment of medium artillery observers under the heading of shooting, although the subject well deserves a book by itself. By way of background, I wish to point out that there has been, to my knowledge, no positive doctrine laid down on this phase of medium artillery operations. The book simply states that general support fire missions usually originate with the liaison officer of the direct support battalion, are cleared through Div Arty, and are fired by the medium battalion. That method is okay, but if you depend on it for all your fires you will be about 30% effective in supporting your infantry with observed fires. The best way to deliver medium artillery fire accurately and in sufficient volume is to have your own FO on the spot handling the mission. That fact is absolutely fundamental. It can not be stressed too strongly.

When we send an FO on a mission we assign him a particular infantry battalion to support, but we leave up to his judgment the problem of where he can best position himself to execute the mission. Sometimes he is at his own OP, sometimes with the Inf Bn CO, sometimes with the liaison officer of the direct support battalion, sometimes with a low echelon of the infantry. One of the better positions for him is to accompany the liaison officer, and when something hot gets under way go forward to conduct the mission. In this manner our FO keeps in close contact with the situation, yet he is also available for the conduct of fire missions in any decisive sector.

We do not attach our observer to the light battalion. He remains an independent agent under the supervision of our battalion S-2, but he does cooperate with and assist the direct support liaison officer at all times. In effect, our observer functions as a second liaison officer except when he is actually conducting fire missions. In this capacity as a second liaison officer, his communications furnish an auxiliary channel which



Colored units are among the 155-how outfits that have been fighting in France since the Normandy battles.

may be of great value in case the direct support outfit has temporary communication trouble. Also, the reports our FOs send back to DivArty through our CP give DivArty an excellent secondary source of front line information.

Fire Direction Center

Our FDC is organized and operates exactly according to the Sill solution, except in one particular. Our senior computer does not act as computer Baker. Instead, he is charged solely with the duties of checking all data sent by the battery computers, and the solution of all metro messages plus the determination of the latest slide settings. He is divorced from the responsibility of sending fire commands to any battery so he can concentrate all his attention on the other computers. We have found this system very effective in the rapid detection and correction of errors, and we prefer it for that reason. Where do we get another computer Baker to replace this senior computer? This Yehudi materializes from the instrument sections of the firing batteries or from the survey section.

One other point I wish to stress about FDC personnel—you must have at least two complete, independent, well-trained FDCs—one for day and one for night. If you do not have them already, get them before you hit combat. Again that question—where do we get another FDC (night) to replace our FDC (day)? Again the same answer—from the instrument sections of the firing batteries and from the survey section. (If you will read on to my comments on survey, this glib answer may make more sense.)

Something on Corrections

Our firing with the M1 howitzer has led us to certain conclusions regarding corrections to be applied to particular data. I hasten to point out that these conclusions are based solely on experience and not on any proving ground test, so they may be somewhat in error. By talking with officers from other 155 M1 How outfits, however, I find that many of them have arrived at approximately the same conclusions independently, so shall pass ours on for what they are worth.

As a result of an accurate calibration conducted back in the U. K. we arrived at a VE of -32 ft/sec with M107 projectile. Although the amount of a VE obviously varies with

each position, this one has held up quite well and we feel that it represents a sound average VE for our weapon. In determining the time correction with M55 fuze we found that a normal slide setting consistently gave grazes, so we use a TiK of—1.4 sec. (at 25 sec. fuze range) for the initial round of a time adjustment. This time setting has always given us a time bracket by a single .4-sec. change after the initial round. In changing to 105 fuze after a precision adjustment with M51, it is necessary to increase the range from 50 to 100 yards as the 105 has a CI a bit short of the M51. In employing BE smoke, we knock off 2 sec. on time and between 100 to 200 yards in range to allow for the roll of the cannisters. Surveillance is strongly urged on all smoke missions, for the wind in the target area doesn't always blow in the direction the latest metro indicates it is.

Lately we have had some very sketchy experiences firing captured 155 Schneider ammunition in the M1 How. It shot quite satisfactorily for observed missions, but we don't put it closer than 500 yards to our own troops. We have not worked with it enough to build separate slides on it for our own GFTs (and we have no correction tables for figuring metro on it anyway), but we do get shootable results by using the Ch V Mk 107 slide at a VE of +47 ft/sec when shooting Green Bag Schneider and by using the Ch IV M107 slide at a VE of zero when using White Bag Schneider.

Use of Captured Artillery

In their haste to put the Siegfried Line between themselves and us, the Jerries have left a lot of shootable artillery pieces behind. Therefore, don't be surprised if your Division Ordnance Officer proudly presents you with a battery of captured material. With that battery you will, if you are lucky, get one grimy tabular firing table and an unlimited supply of ammunition. The chief difficulty will be that no one knows whether the firing table applies to the weapon or whether the ammunition is the right type for the weapon or whether the firing table applies to the ammunition. You figure those simple things out for yourself. The best way to answer all questions is to load the most likely-looking projectile ahead of the biggest bag of powder at the maximum elevation, then tie on your longest lanyard, put everybody in their deepest fox holes, and pull. If she goes off, and hangs together, and the infantry doesn't report a short round, you have a new battery all your own. Seriously speaking, if you wish to shoot it accurately the only thing to do is to build up "experience tables" based on frequent registrations. After you have fired enough registrations, you will arrive at a usable firing table. As for the Jerry materiel, it is subject to the same weaknesses as ours. It must have its daily care of materiel and daily bore sight, otherwise it won't perform.

Maps and Survey

To my mind the two major factors contributing to the effectiveness of American artillery over here are the superb maps we have been furnished, and our cub planes. As for the maps, they have made survey practically a cinch; and the identification of a point in the target area (once the observer is oriented) offers no problem whatsoever. In combat, we have not made a target area survey except by inspection. The map is so much finer a firing chart than any we could construct that the execution of anything except an accurate position area survey is gilding the lily. The presence of three or four trig

points within a few thousand yards of any position area insures a very accurate location of the howitzers and an equally exact establishment of direction. Except when we are operating near the edges of a grid system, the deflection correction change obtained from registration should always be between zero and 10^m of metro data—and much closer to the first figure than the second; any larger correction should be checked very carefully. Range corrections are not quite so steady, primarily, I believe, because of our large number of powder lots and the inherent range probable error. Generally speaking, range Ks should vary between 0 and ±20 from metro data. Perhaps these tolerances may seem too small but, with the maps we have here, anything less than perfection is not good enough. One big advantage of these maps is that the battalion survey section can handle all the survey work for the unit. In fact, they usually execute the complete survey in 1½ to 2 hours. It has never been necessary to call on the battery instrument section for help. Thus the battery personnel is available for duty on FO parties and on that second FDC I mentioned several paragraphs ago. Also note that your battalion survey section is not too over-worked and can be used on that FDC also.

Calibrated Pieces

My last note on shooting concerns calibration. Prior to our entry into combat we had the opportunity to perform a very accurate relative calibration of our 12 M1 hows. This was a great boon in the effective massing of the fires of the battalion. Now, after approximately six months of combat, we have six of the calibrated howitzers left and the six new arrivals constitute a definite but unknown element. The six uncalibrated pieces arrived as a result of the swift and efficient unit replacement system of our ordnance. If we take a howitzer back for any repair which will involve a dead-line of more than a few hours' duration, we get a new howitzer pronto; and our old one, after repair, goes to some other unit as a replacement. The system is really wonderful, even if it does cause us to lose our calibrated pieces. I mention this merely to prepare units for the eventual ineffectiveness of their original calibration results. If calibration is worthwhile each new piece can get a VE in relation to a known one.

COMMUNICATIONS

My only comments on Field Artillery communications are kind ones. We have learned to depend upon our radios more and more, particularly for our FO parties. My organic wire means are inadequate to cover a large front, for I have only one LnO and he has no section or wire vehicle, so radio is our answer. We have tried a few points of technique which have worked out quite well. In all positions we send out one 608 near the front to act as a relay from the FO to FDC. If the FO's 'way out front we send out a relay team of a 610 and a 284 mounted on a ¾-ton WC. Many fire missions follow this channel—from 526 with FO to 536 with FO jeep, from 610 in FO jeep to 610 in relay vehicle, from 284 at relay to 284 at FDC. This sounds involved and cumbersome, but it has worked very well. We attempt to eliminate all useless transmissions by having all relay sets merely mimic the FO and S-3 once the mission gets under way—if each set called the other on every transmission, the system would be much too slow.

I would like to emphasize our absolute trust and dependence on the radio sets which we now have in the FA. If the radio operators and technicians maintain their sets properly and use correct radio discipline in transmissions there is, to my mind,

no reason why any unit should lack radio communication under normal circumstances. Units which are having radio trouble will generally find the source of their trouble in the fact that their operators and technicians spend more time explaining why their radios should not work than they do in study and maintenance.

Despite those kind words about radio, the old saying still holds: "Wire is the primary means of Field Artillery communication." I have nothing to contribute as a commentary on wire except two points. One is—you guessed it—lay your wire cross-country. Particularly is this true of the forward lines, where the tanks and TDs use the roads and the Jerry mortar interdicts the crossroads. Also is it true of your most important wire lines—from FDC to firing battery. That line is too important to risk; so lay it as far away from everybody and everything as possible.

The second point is this. After you have laid one line from the CP to firing battery, then lay another one. Some rather unfortunate experiences with cross-talk on simplex and no talk at all on anything because one enemy round took out the trunk line, have convinced me of the desirability of two good metallic lines from FDC to firing battery, each laid over a different route. The best system seems to be for battalion to lay the trunk line from its switchboard to battery switchboard, and have the battery detail lay a direct line from the battery computer at FDC to the battery executive. That is the most important single line in your system—it's the one the fire missions go over.

GENERAL

Bn Comdr in Combat

Now for a few general comments. In my opinion, the primary duty of the artillery battalion commander in combat is to adjust the functioning of his battalion to fit the tactical situation at the moment. If your unit has trained properly in accordance with the things taught at Sill and other schools, it has adequate technical ability to master any problem met in combat. It is the duty of the Bn CO to tell the battalion what technique to apply. Fortunately for the CO, certain elements of the battalion function in the same manner under almost all conditions. For instance, the firing battery itself, the FDC, and the communication sections use the same technique in most situations.

Other elements change their technique almost daily. Particularly is this true of the observers. For instance, in the hedgerow country the FO carried nothing but himself, his pistol belt, and a map folded to fit the palm of his hand. He was often employed with the front line elements because there was no other way for him to get targets. From there we come to a hilly country, which was a paradise of OPs. There the FO could use a service practice set-up with excellent results.

Yet another phase of the battalion's activities which is constantly changing is its method and speed of conducting a combat RSOP. All units seem to be caught off balance by a sudden change in the tempo of an action. We all know that the Jerry holds until the last moment, then pulls out rapidly to his next line. Most of us have been reading that ever since Jerry first started to retreat back in Tunisia, yet we still get caught behind when he does retreat. If, for instance, your outfit has been slugging away at a particular line for a month and making a cautious, leisurely RSOP involving a displacement of 2,000 yards every five or six days, it is not an easy matter to adjust it to the immediate necessity of making three rapid displacements of about 8,000 yards each when Jerry finally does pull out. Such an

action will probably be necessary, however. The Bn CO must prepare his unit for it.

Grasshoppers' Effectiveness

The Cub planes, like our maps, have been the answer to an artilleryman's prayer. "Invaluable" is the only adjective which describes them. They have performed about 40% of our observed missions and more than 60% of our precision registrations. Their effectiveness in spotting Jerry artillery is unequalled by any other agency. In the hedgerow country where ground OPs were non-existent, the Cub was the only thing which was effective against Jerry SP guns—by the time sound and flash picked them up, the SPs were somewhere else.

In addition to their extraordinary performance of their normal mission, the Cubs have executed many auxiliary missions of great value. For instance, ours kept track of the progress of the motorized elements of our infantry during the Mayenne—Le Mans encirclement. They also reported the progress of the two armies meeting at the Falaise gap, they have acted as elevated radio relay stations to allow DivArty to communicate with its battalions over ranges of 30 to 40 miles, and they have dropped plasma and medical supplies to units which were cut off from motor transport. All these uses were not originally contemplated for these planes, but our air superiority makes such employment a calculated risk worth taking. As of this date, my battalion has not lost a pilot nor an observer, and as long as we do not expect the impossible from planes or pilots we do not expect any loss in combat.

Training

In common with other units, we have found that all our observed fires in combat have been conducted by a forward observer using air-ground methods. This fact has caused many artillerymen to point with scorn at the many tedious hours we spent in teaching small-T and large-T back in the States. They say it was a waste of time, that we should teach only the air-ground system because that is what we use in combat. I, for one, can not agree—I like to look upon small-T and large-T as an undergraduate school in observed fire. The air-ground method is for post-graduates only. The saddest spectacle in gunnery is an attempted adjustment by air-ground methods on a large-T target by an inexperienced observer who does not know his large-T procedure. Teach him his large-T first—then let him try the air-ground method. As for air-ground procedure, it is a beauty as long as the observer remembers that one simple rule—"Get a bracket"—and forgets that one abomination—"Range and deflection approximately correct." I still see officers in combat call for fire for effect without first establishing a bracket. Will they never learn?

More stress in training should be placed on the adjustment of fire when excellent initial data is available. The quality of the maps and firing data in combat enables us to place the first round very close to the target on most occasions. The observer should be able to make an immediate change which will insure effective fire at once. Technically speaking, we need training in the surveillance of fires as well as in the adjustment of fires.

A counterpart of the necessity for surveillance is the requirement that more training be given in the accurate reading of maps. I would like to italicize the word, "*accurate*." Many times, observers report locations of targets to the nearest 100 yards which could by a little study be reported as accurately

to the nearest 10 yards. The inevitable result is wasted rounds in adjustment and wasted effect on the target, for Jerry does not wait for the second round. If we could reach a state of training wherein the ability of the observer to report targets accurately was equal to the accuracy of our firing data, we would be approaching the artilleryman's millenium—fire for effect on the initial rounds. So, for our observers who are still in training, give them accurate maps and insist that they read these maps very exactly.

Close-In Fires

Each unit should be prepared for a drastic revision of its ideas concerning how close artillery fire may be placed to its supported troops. We have, for instance, fired a successful precision adjustment on a tank which was 75 yds. from the observer (I guess he figured he would rather be killed by a 155 than an 88); we have placed battery volleys within 125 yds. of our infantry; and the battalion has fired concentrations within 200 yds. Such firing is admittedly a ticklish business, and these distances are definitely not recommended for training. We have had no short rounds, however, and the infantry likes to have our stuff landing close. Of course, on all close-in missions we double-check the data and take the added precaution of telling the chiefs of sections that the mission is to be a close one. In our work on Maizieres-les-Metz we had one battery of 8-in hows and one of 240s attached to our battalion. The 8-in was fired within 200 yds. of our troops and the 240 within 250 yds. Their accuracy, particularly that of the 8-in, was a beautiful sight to see and they performed a magnificent job on those masonry buildings. For instance, one captured Jerry lieutenant reported that he and his reserve platoon were deep in the basement of the schoolhouse when a bomb dropped in and left only himself and four men. There were no bombs dropped on Maizieres-les-Metz—that was a 240.

In your infantry-artillery training, teach the platoon leaders and company commanders how to call for and adjust artillery fire. Most units make a stab at this training but their work has not been thorough enough. When you get to close country (such as hedgerows) where no FO can see more than a 200-yd. square, the infantry will have to handle most of its own close-in support. Be sure they can do the job.

Another point on this work—too often, the infantryman's training in artillery consists of a school in the technique of adjusting fire, and his paramount problem on the battlefield ("Just what channels of communication shall I use for this mission?") is completely ignored. The infantryman's job consists not so much in adjusting fire as in calling for it rapidly. Therefore teach him the various means at his disposal, then tell him how to adjust. If he can call for fire and we give him a round in the area, he will place the rounds on the Jerries by main force and awkwardness, if not by 6-40.

BE Smoke

We feel that the artillery has a very potent weapon in this BE smoke but often neither the artillery nor the infantry is awake to its possibilities. We did not exploit it enough in our actions up to the past two months, but we have employed it very effectively in several recent operations, and I expect it will become more popular as its use increases. Of course, no doctrine can be prescribed for its employment, for the circumstances of terrain,

weather, and tactical situation will determine its use. I merely urge all artillerymen and infantrymen, when making a fire plan for any operation, to ask themselves, "Can I use BE smoke on this one?"

Combat Loading

Prior to combat we spent long hours in an attempt to contrive a loading plan for that staggering combat load of ammunition, men, and equipment. After a short term in combat we blithely carry a combat load of everything plus 50% of everything, plus some new things. Where it all finds a place I do not know, but I do know that after each displacement all hands are always present for first chow in the new area. We make particular efforts to carry excess amounts of the two essential commodities (no, not food and gasoline) —ammunition and wire. Normally we carry at least 200 extra rounds of ammunition; on short hauls over good roads we have carried as much as 400 extra. We take any reasonable amount of wire we can get hold of. In addition, there are several items to be accommodated which I never saw on any official loading plan—such as the three extra blankets we now have for winter use. Also, how about that Liberty Ship full of Christmas presents which is marked for my FA Bn? Where do I carry those? I guess I shall ask Santa Claus for a Xmas present truck as a Xmas present.

When Visiting the Front

My last point is one I would like to impress indelibly on the minds of all artillerymen. It is the most elementary of truths; but I have seen and heard of its being violated so often, with tragic results for the violators, that I can not forego this advice. When you are going to the front lines to see your infantry or to inspect your OPs, *find out where the front lines are*. Check at each echelon from regiment to platoon if necessary, but don't go blundering off by yourself. Also, don't disregard the advice of the doughboys. If a platoon sergeant along the road stops you and says, "Sir, I wouldn't go any further down this road just yet," forget about that pretty blue line on the corps situation map which indicated that this road was cleared yesterday. Just wait for the infantry to catch up with the situation—they will get there in due time. For my money, failure to follow the advice in this paragraph has caused our army more purposeless casualties, particularly among officers of field grade, than any other factor.



Even as at home, France's first snow-fall was wet and clinging, making a particularly sticky mud.

FDC Communications

By

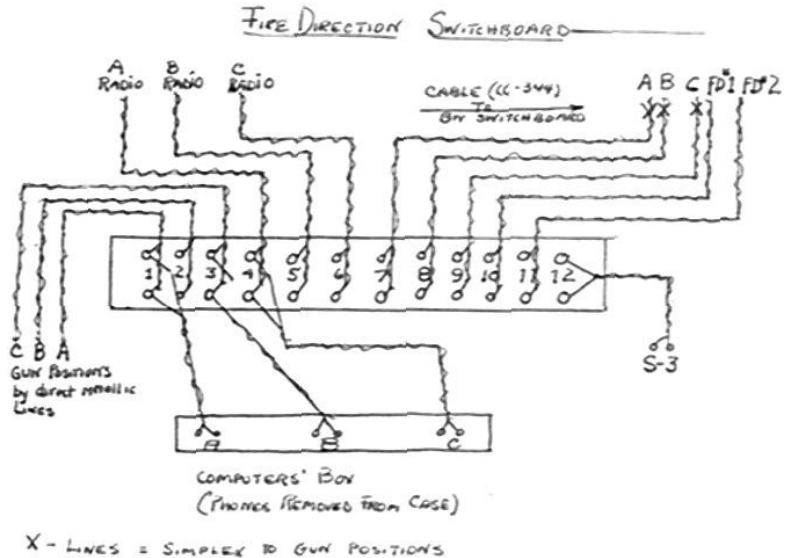
Capt. J. W. Thompson, Jr., FA

Between ComO George W. Cumming and T/5 Bramen B. Sides (command post wire chief) our battalion has set up the following system. For speed of installation, efficiency, and rapidity of march order, Capt. Cumming will stack it up against any. He contends it will work anywhere in the ETO. It has been battle tested in France.

A special BD-72 (borrowed from supporting antiaircraft who weren't using it) is set up in FDC near the S-3. To this board come all direct lines from the firing batteries; the 3 simplexes of the direct lines; 3 remote control lines to 3 radios (610) assembled elsewhere under supervision of the radio sergeant and forming the alternate means of communications to the batteries; fire direction No. 1 and No. 2; and an S-3 phone.

From this special board the lines run by cable or W-110 wire to a terminal strip and thence to the main battery board. To this main board, of course, run the regular lines to higher headquarters, battery trunk lines, regimental lines, and lines to artillery liaison officers.

On the computers' table is a box with hinged top,



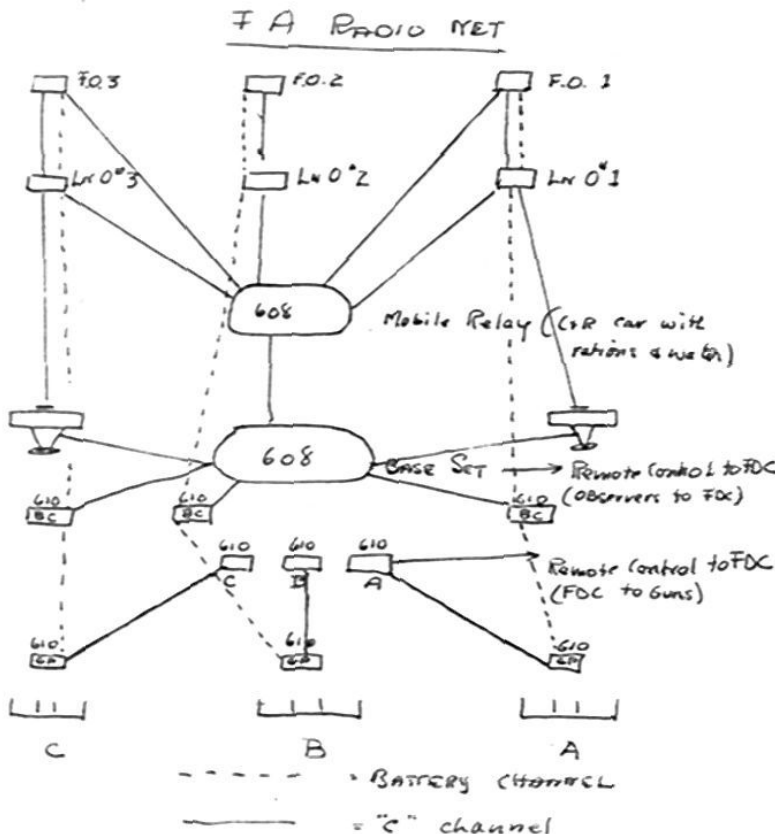
containing 3 phones connected to the special board. Only one other phone—the S-3 phone—is running out of the board. About the only other phones necessary in the FDC are those of the single radio operator (who is personally present, working the remote control to the 608 radio with the observation planes and FOs) and any liaison phones for supporting units. S-2 phone runs to the battery board.

How does it work? From a single phone each computer can reach his firing battery by direct line, simplex, and radio. If the direct line goes out the operator at the board can plug in the simplex. If both are out, he can plug in the radio remote control and ring the single radio operator watching the three battery sets. This operator puts the computer "through" to his battery direct as his own operator. This last works since each computer received instruction in remote control operation and radio procedure from Capt. Cumming.

Does it work? In many cases we have effectively and rapidly massed artillery fires with one or more batteries on radio and the remainder on wire. It's smooth. There are maximum efficiency and communications with minimum personnel and equipment—all vital to an outfit running 24 hours a day.

Advantages of this set-up:

1. Elimination of a lot of phones around FDC.
2. Placing in the hands of the computer himself three means of getting to his battery without moving from his position, and over a single phone.
3. The computers' phones are boxed, which means protection for the phones, easy loading, and rapid set-up and march order.
4. Use of the switchboard requires only a single operator for all FDC wire instead of a lot of individual phone operators.
5. Assembly of computer radios at the radio section requires only one operator for three sets. The conservation of manpower is obvious.



THE CENTRAL LUZON PLAIN

By Col. Conrad H. Lanza

Luzon is the largest and most important island in the Philippines. The Central Luzon Plain is the most important part of Luzon. It is approximately 110 miles long (from Lingayen Gulf on the north to Manila on the south), with a width of from 30 to 40 miles. It is bounded on the west by the Sierra Zambales, a rough mountain range with few passes, which have an elevation of 4,000 feet or more. On the east, in the northern sector, are the Central Gran Cordillera, sometimes called the Caraballos Occidentales, which are the highest mountains in the Philippines. North of Lingayen Gulf these mountains are parallel to the west Luzon coast and only slightly inland. At the Gulf they trend to the southeast and halfway down the plain merge with the Sierra Madre, the main range of Luzon, which lies close to the east or Pacific Ocean side. The mountains on the east side of the plain are uniformly between 3,500 and 4,500 feet high.

Geologists say that ages ago the mountains formed islands in the ocean. The rising land established the plain between the two ranges. In course of time the rains washed from the mountains soil which gradually covered the plain. The mountains are of volcanic origin, and the soil is most fertile. To this day the rivers do bring down soil annually. In the flood season this is deposited on surrounding fields.

The north boundary of the plain is Lingayen Gulf. This is bordered by sand dunes. Behind and through them numerous water courses flow through low ground. The depth of the low area varies from 2 to 5 miles, and is everywhere subject to fire from naval guns from ships offshore.

Manila Bay is the south boundary of the plain. This is lined by low ground, which originally was covered with nipa and mangrove swamps 4 to 9 miles deep. Through the swamps are intricate deltas with numerous interlacing, non-fordable streams. Some are navigable by motor launches.

From a military point of view the best approaches to the Central Luzon Plain, for large forces, are either from Lingayen Gulf or from Manila.

The climate of the plain is a two-season one—dry and wet. High mountains on the east cut off the rains of the northeast monsoon, which are deposited within the mountain range. This causes a dry season from December into April, both months inclusive. But in the latter part of April, or in some years in the month of May, the southwest monsoon brings the wet season. In general the rain comes in the afternoons and is heavy for two hours or so. This lasts through November. The typhoon season extends generally from July to November, both inclusive. Typhoons bring heavy rains and, if the center is near, high winds. These

rains last for days, it being not unusual for rain to fall steadily, without interruption, for nine or ten days. During typhoons large sections of the plain may be under water.

The plain is densely populated and densely cultivated. Main crops are rice and sugar. During the wet season rice lands are mud and may be inundated. They are watered by extensive irrigation systems whose numerous ditches and small dams, when wet, are an obstacle to all wheeled transportation. During the dry season the rice fields dry quickly under the tropical sun and may be traversed without difficulty. Ditches can be avoided, or crossings can be extemporized rapidly.

Excluding that part of the plain adjacent to Manila, its population exceeds 2,000,000.

At the north end of the plain is the province of Pangasinan, with an area of 1,944 square miles and a population of 742,475 (1939 census). Its inhabitants originally were a tribe of the same name having a language of their own. Now there are many Ilocanos present.

Adjoining on the south are the provinces of Tarlac on the west and Nueva Ecija on the east. Their areas are respectively 1,178 and 2,069 square miles, and their populations 264,379 and 416,762. The inhabitants of Tarlac used to be entirely of the Pampanga tribe, whose province of that name is just to the south. Many Ilocanos and Pangasinans have emigrated to Tarlac, where now all three languages are spoken.

Pampanga (on the west) and Bulacan (on the east and partly south of Pampanga) are the southern provinces, with respective areas of 823 and 1,007 square miles and populations of 375,281 and 332,807. Bulacan is inhabited by Tagalogs,



After a great sea and air bombardment, American Sixth Army troops were put ashore on the southern and southeastern coasts of Lingayen Gulf. Four beachheads were seized and the troops penetrated inland against scattered resistance. Their goal is Manila, 107

Pampanga by the tribe of the same name. In all there are four main language groups in the Central Luzon Plain.

Pangasinan borders Lingayen Gulf. In its native language *panga* and *asin* mean salt and country, the combination meaning the "salt country." This results from the extensive tidewater lands' being utilized for salt production by evaporation of sea water. This is the only province in the plain where coconut palms are common. Both rice and sugar are raised in large quantities.

The province extends about 20 miles inland. Two rivers, the Dagupan and the Agno, are the main military obstacles. The Dagupan enters the province from the northeast, flowing parallel to the coast and then by a wide curve entering Lingayen Gulf nearly at its center. The Agno River enters from the northeast and is 5 to 7 miles south of the Dagupan River which it at first roughly parallels; it then makes a wider sweep, turns north, and enters Lingayen Gulf through a delta extending from the mouth of the Dagupan for 12 miles to the west. Both rivers, but the Agno particularly, have swift currents. In the wet season when the water flow is high, these streams are hard to cross. In the dry season they can be readily bridged.

Dagupan is a port suitable for medium ships. A second small port is Sual, 14 miles to the west. The latter is seldom used commercially, for Dagupan is the railhead for the government-owned Manila Railroad, which extends from there to Manila. This is only a 42"-gauge road but it ordinarily handles a heavy traffic, having nearly displaced the former sea transportation routes out of the Gulf.

Closely following the railroad is a paved road to Manila. This is an all-weather route with excellent bridges over numerous streams, of which that over the Agno River is the first important one. This is a concrete bridge near Bayambang with a draw in the center, as the river is navigable for small craft.

A second paved road extends to Manila east of the railroad, crossing the Agno by a good bridge near Villasis. To the west and east near the foothills are secondary roads, making four in all running axially through the plain.

Five miles northeast of Dagupan is San Fabian. This is an open roadstead but could be used for debarkation and base purposes. A good coast road from Sual passes through Dagupan to San Fabian, and then continues on north along the coast.

In the dry season it is possible to debark at numerous places along the Gulf. Besides the coast road another lateral road exists north of the Agno River. The west boundary of Pangasinan is in the Zambales Mountains. This sector is a high plateau, with rolling open country suitable for military motor vehicles.

Tarlac Province is about 35 miles deep from north to south. Its capital of the same name is on the center line, but close to the east boundary. It lies on a branch of the Agno River which flows north and joins the main stream just across the Pangasinan boundary. The Manila RR and the main highway are east of this branch of the Agno, which is sometimes called the Agno and sometimes the Tarlac River. Both railroad and road pass through the city of Tarlac.

Tarlac city (pop. 55,682) is on the divide between streams flowing north into Lingayen Gulf and others flowing south into Manila Bay. Seven miles east of Tarlac is the Rio Chico, a branch of the Rio Grande de la Pampanga. The Rio Chico is parallel to the Agno but flows in the opposite direction. The 7-

mile space between is a defile suitable for a defensive position. The west bank of the Agno is hilly; it dominates the low country extending into the far side of the Rio Chico.

Just at Tarlac the Tarlac River comes in from the Zambales Mountains to the west. It makes a right-angle turn immediately below Tarlac in changing direction to the north. The south side of the Tarlac affords another defensive position.

Tarlac Province varies from 35 miles in width at the north to 25 miles in the south. The west half lies within the foothills of the Sierra Zambales. This section is sometimes referred to as the Cordillera de Cabusilan. There is considerable open ground among the lower hills, which can be traversed by troops. Valleys and ravines trend east or northeast, nearly normal to the invasion route from Lingayen. Consequently troops advancing southward west of the center of the province are confronted by a succession of ridges and streams. The streams turn north, or south, after clearing the foothills.

Near the center of the west boundary is Mt. Iba, about 5,000 feet high. An east-west road crosses the Zambales range near this mountain, connecting Tarlac with the west coast. The higher mountains are covered with forests and so are a difficult obstacle.

The eastern and central parts of Tarlac Province are generally cultivated—low ground mostly with rice, the higher ground with sugar. At the northwest corner is an extensive irrigating system, based upon a dam across a branch of the Agno River near San Miguel de Camiling. This town, commonly called just Camiling, is a rice-milling center.

There are extensive growths of bamboo in the low country, it often being grown as hedges between fields. They can be passed by troops without difficulty, but often they limit ground observation to not over a few hundred yards.

All towns in Tarlac Province are connected by good roads. The principal towns are on the railroad which is parallel to the east boundary and 6 to 9 miles away from it.

Nueva Ecija Province adjoins Tarlac on its east side. Just as the west part of Tarlac extends into the Sierra Zambales, the east part of Nueva Ecija lies within the Caraballo Mountains and the Sierra Madre. The west part of Nueva Ecija, together with the east part of Tarlac, is in the Central Luzon Plain, densely inhabited and cultivated. Rice is the main crop but oranges, bananas, mangoes, and other tropical fruits are common.

Commercial center and capital of the province is Cabanatuan (pop. 46,626). It is on the south side of the Rio Grande de la Pampanga, which rises in the northeast corner of the province and leaves at the southwest corner. Cabanatuan is 20 miles from the latter.

About 15 miles north of Cabanatuan is Munoz. From this town a branch of the Manila RR goes south through Cabanatuan, parallel to the main line through Tarlac. This branch joins the main line in Bulacan. A road extends from Pangasinan through Payud and Munoz to Cabanatuan. Another and better road from Pangasinan is parallel to and about 5 miles from the west boundary, coming from Villasis in Pangasinan. This latter road by-passes Cabanatuan, but there are connecting lateral roads. The two roads from Villasis and Payud in Pangasinan are the natural invasion routes through Nueva Ecija. The main obstacle for both roads is the Rio Grande de la Pampanga, which is normally crossed by rather elaborate bridges at Cabanatuan and San Isidro at the southwest

end of the province. A road follows the south bank of the Rio Grande for its entire length, and extends northeastwardly across the mountains into the Cagayan valley.

Streams run generally in a northeast to southwest direction—practically normal to invasion routes from the Lingayen area. In the dry season the main streams may be 20 feet or so below the adjacent fields, with banks nearly vertical. It is practicable for troops to negotiate these banks. For vehicles, approaches must be constructed unless high-level bridges are made available. In the wet season streams rise and in places overflow into the surrounding country. These stream conditions are general and apply to both Bulacan and Pampanga Provinces.

The foothills contain much open, rolling country. The main mountain chain is rough and jungle-covered.

A second branch of the Manila Railroad leaves the main line at Paniqui (11 miles north of Tarlac city) and extends laterally into Nueva Ecija, closely following and just inside the north boundary. As this branch line touches the two axial roads from the north at Rosales and San Quintin, it would be useful to troops based on Manila; it would not be particularly useful for troops moving in the opposite direction.

Considering Tarlac and Nueva Ecija Provinces jointly, there is no natural line of defense against an invasion from the north. It is practicable to establish lines at several locations, depending upon the number of divisions available. Just north of Tarlac the Central Luzon Plain is about 35 miles wide, and is as short a line as possible with flanks resting on foothills. It would pass from Tarlac through Vitoria (near Talavera in Nueva Ecija) and Bongabon (on the Rio Grande), and block all invasion roads.

Twenty miles south of that line a 30-mile front could be established generally along the south boundaries of Tarlac and Nueva Ecija Provinces.

Pampanga Province adjoins Tarlac, being just south. The north boundary of Pampanga extends for about 10 miles along Nueva Ecija and to across the Rio Grande de la Pampanga. This river is everywhere unfordable, lying between steep banks in the upper reaches and in swamps in the lower. Its course, nearly due south, takes it into Manila Bay through an extensive delta at the southeast corner of the province.

Capital and commercial center is San Fernando (pop. 35,662), on the north side of the Rio Betis near the south center of the province. Through it extend the main line of the Manila RR and the main north-south highway. A branch railroad goes up the Betis River to Arayat, which is on the Rio Grande near the Nueva Ecija boundary. Just beyond is Mt. Arayat, a volcano (supposed to be extinct) which rises right out of the Central Luzon Plain to a height of 3,300 feet. This landmark mountain is visible from Manila.

From San Fernando another branch railroad extends down the valley to Lubao, then turns west to Florida Blanca. This point is the railhead for Bataan over a good road.

From Florida Blanca a road extends northeast to the Manila RR at Angeles, passing along the foothills of the Zambales Mountains (here called the Cordillera de Mabanga) and the Cordillera de Cabasilan. Angeles is an important town. Northwest of it is Fort Stotsenburg at the base of the foothills. The surrounding country is mostly sugar plantations, with many bamboo hedges.

Stream lines start in the western foothills and generally run in a southeast direction into the Rio Betis, which is unfordable and a military obstacle. Between the Betis and the Rio Grande streams are short and parallel to these two rivers—about south or south-southwest.

The delta and swamp area is 10 miles deep, bordering Manila Bay. There is one coast road through it. This section is a material obstacle to military operations. Nipa and mangrove cover the area, with deep watercourses in all directions forming a labyrinth of passages. Notwithstanding what would appear to be undesirable living conditions, a number of natives live in these swamps and engage in fishing and cutting and shipping nipa and mangrove wood.

There are two good roads from Tarlac into Pampanga, one along the railroad and the other about 6 miles to the east. Soon after entering this province the road net expands, there being about 10 roads parallel to the railroad as far as the Rio Betis. Thereafter there are three, the two outside ones (through San Fernando and through Arayat) being the main highways. At the head of the delta of the Rio Betis is Guagua, 6 miles from San Fernando by a good road and which can be reached from Manila by motor launches and similar small craft. It is therefore practicable for the enemy to supply all troops beyond the Rio Betis by water and road transportation even if all railroads and axial highways have been interrupted by air bombing.

Many of the roads in this area are lined with bamboo. For road movements these afford excellent camouflage against air observation. In the central plain towns are numerous and in places run into one another.

An invasion force entering Pampanga from the north, upon reaching Angeles has a choice of operations. It may continue on to Manila or diverge southwestwardly into Bataan with a view of capturing Corregidor and opening the entrance of Manila Bay. If sufficient troops are available both missions may be accomplished simultaneously.

Bulacan Province is south of Nueva Ecija and east of Pampanga. It borders on Manila Bay for some 17 miles. Its south boundary then circles around the north part of Rizal (Manila) Province. This is one of the wealthiest provinces in the Philippines: it is close to Manila, and its soil is unusually fertile. That part of the province within the Central Luzon Plain is its west third. Thereafter come foothills, and in the east the high Sierra Madre.

The Manila RR and the main highway follow around and about 5 or 6 miles away from Manila Bay. They are separated from it by a delta and swamp country traversed by innumerable streams, some of which are navigable for small craft. At the southwest corner of the province is Hagonoy (available to the enemy for supply by water) and thence by road to the interior.

Both railroad and main highway enter the province by crossing the Rio Grande de la Pampanga near Calumpit by major bridges. In the dry season banks are 20 or more feet high and nearly vertical.

The two other roads from Pampanga converge with the main road near Malolos, the capital (pop. 33,384). Malolos was the original Philippine Republic's capital, and has retained a sentimental value for Filipinos. Five miles to the southeast along the axial road is Bigaa. At this point is the juncture of the railroad branch from Cabanatuan in Nueva Ecija. Two roads from Nueva Ecija join at San Miguel de Mayumo, 5 miles from the Nueva Ecija boundary. From there a road

goes due south to Malolos, while another goes directly on into Manila, being 6 to 8 miles east of the main road.

Most of the cultivated part of Bulacan is rice. There is very little sugar. Corn is raised in the foothills to the east. The mountains are covered with jungle forest.

The Central Luzon Plain through Bulacan is only about 20 miles wide. There are numerous stream lines cutting the axial invasion routes at right angles, and mostly unfordable. These give opportunities for defense, but no one of them is more suitable than another. The south boundary of the province is 7 miles from Manila.

COMMENTS

1. The campaign of 1941-1942 led to only one serious battle. When the Japanese landed at Lingayen Gulf they were repulsed by American forces. Another landing north of the Gulf succeeded, and the Japanese entered Pangasinan from its northeast corner. Their main effort was against the American right extending down into Nueva Ecija. This campaign was abandoned by the Americans on account of the general situation, and a practically unopposed withdrawal made through Angeles into Bataan.

2. In 1899 a campaign was conducted by American forces through this same plain, but in the opposite direction. Starting from Manila, it took 10 months of warfare to reach Lingayen Gulf. Most battles centered around the stream lines, which were forced one after another. In the later stages an amphibious expedition landed in Lingayen Gulf in rear of the enemy and materially aided in ending the campaign.

3. In 1896 and 1897, Spanish troops defended the Central Luzon Plain. They were attacked by a revolt of their own Filipino troops, who of course were armed. This led to a series of detached engagements at the various

towns where there were army posts. In some cases the Spanish troops attempted to withdraw. Most of those in Bulacan reached Manila. Those further away were not so successful, and in a large part were captured. One Spanish battalion in Nueva Ecija marched over the Sierra Madre to Baler and defended themselves until relieved by Americans in 1900.

4. The 1896 and 1897 campaigns furnish no useful lessons as to the defense, or capture, of the Central Luzon Plain. The 1899 and 1941 campaigns indicate that the plain can be defended, and that major defensive lines can be expected to be based on unfordable rivers. The 1899 campaign, fought through both dry and wet seasons, proved that military operations are not stopped by rains. The rains and attendant swollen streams and flooded lands do cause difficulties. They are not insurmountable.

5. In none of the campaigns considered have the native populations, other than troops, interfered with or aided either combatant. The great mass of people were primarily concerned with the safety of themselves and families. Filipinos regularly enrolled fought hard, and equally well on whichever side they were. In 1896 and 1897 some fought with and others against the Spaniards. In 1899 some fought with, and others bravely against, the Americans.

6. Filipino towns are largely constructed of very inflammable light material, including bamboo and nipa. The central part of large towns is often built of stone. This is so soft that frequently it can be pierced by machine gun bullets—affording camouflage, but no protection to defenders within. Nearly all towns have a church of stone with some kind of steeple or tower. Due to the flatness of the plain the view from the church steeples is usually extensive. It is practicable to maintain a communication system between towns by signals from church towers.

7. Rice fields, except those in the tidal region, can be crossed by troops and vehicles during the dry season. In the wet season they are a decided obstacle to all classes of vehicles.

DON'T BELIEVE YOUR EYES

Dear Joe:

Remember last week when that Jap plane sneaked in on us and you kept wondering (aloud, of course) why we were shooting so far behind it? Well, I meant to explain matters at the time, but we were a bit rushed then, as you may recall, so I'll have to make this letter and the sketches do my explaining.

Those rounds which you said were so far behind the plane actually were almost dead on the target, but you couldn't tell that. You see, here's the trouble with observing the fire of automatic weapons, as we call our 37-mm and 40-mm AAA pieces. The rounds we fire are equipped with fuzes so sensitive that they will explode on hitting even a piece of cloth but, unlike the shells of the heavy AAA guns (90-mm and the 120-mm), they are not timed to go off near the plane. They must hit the target to do any damage. However, and this is what threw you the other day, these rounds will burst before they hit the ground.

Some years ago we learned, without any great surprise, that other ground troops took a poor view of having our supersensitive fuzed shells falling to earth in their vicinity

after we had blasted away at a hostile plane. So we figured a way to make the shell burst in mid-air before dropping to the ground when it was spent. That job was simple enough, for we just let the tracer element burn its way into the main explosive charge after about 7 seconds and presto—ballistic suicide.

But to get back to that illusion of bad shooting last week. We were firing at a range of about 1,500 yards, which meant

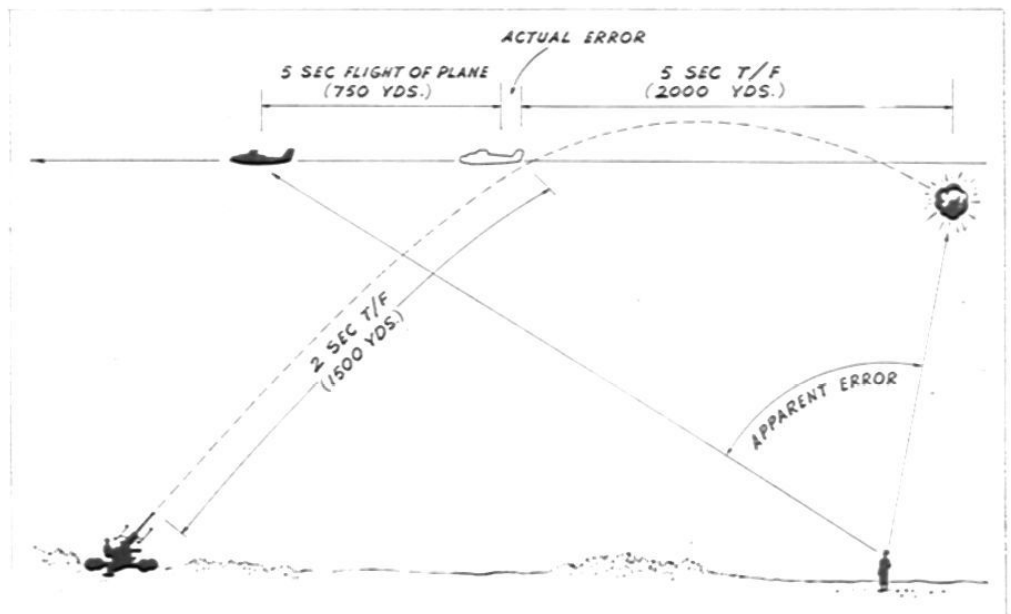


Figure 1. This sketch graphically depicts the difference between the actual error and the apparent error of one 40-mm AA round fired at a 300-mph target at a range of 1,500 yards. Time of flight before self-destruction of shell is assumed as 7 seconds in this instance.

that a 40-mm projectile was reaching the vicinity of the plane in about 2 seconds. Now, those rounds were pretty close, if you'll take my word for that, but none of them hit. Consequently they were going on beyond the plane for about 5 more seconds, or at least 2,000 yards, before bursting. Not only that — the plane was continuing on its course during those same 5 seconds. I think you'll agree that the Jap was doing at least 300 mph, which is about 150 yards per second. At that rate, he was travelling 750 yards while the 40-mm projectile was travelling about 2,000 yards off at another angle. So, when the burst occurred, it wasn't even in the same part of the sky with the airplane.

The sketch (Fig. 1) which I'm enclosing should make things a bit clearer than I have been able to do with words alone. Of course, there's the additional business of tracer observation to contend with, but that subject is a bit too involved for discussion here. And besides, that's not your problem. I'm chiefly concerned now in having you see the light about those 40-mm bursts.

While on the general subject I'd like to mention something about the 90-mms, for they may give you trouble too if you try to analyze their fire. I've already told you that the 90s and other big guns have time fuzes which are set to explode the projectile near the target instead of actually hitting it. So, even if the guns are pointed accurately in elevation and direction, an error in the fuze setting will make the firing appear very erratic.

You see, if you stand near a 90-mm while it is firing at a plane, naturally you'll be looking in a straight line of sight to the target. At the same time, the projectile is following a curving trajectory which will pass through your line of sight at the plane. If the fuze is cut short, the round will burst while it is still on the uphill curve (or "ascending branch") of the trajectory and will appear to burst above the target (as in Fig. 2a). If the fuze is long, the burst will be on the descending branch and will appear to be below the target, creating an effect somewhat like that caused by the delayed 40-mm bursts.

Furthermore, a "high" burst will appear to lead the target because the plane at that time will be short of the point where it meets the trajectory. By the same token a "low" burst will appear to trail the plane, which will have passed on beyond the trajectory by the time the burst occurs.

Of course, if you were out at right angles to the line of fire, you would see the fuze errors in their proper light—that is, as "overs" or "shorts" in range (Fig. 2b). From that position, however, you would be unable to judge whether the rounds

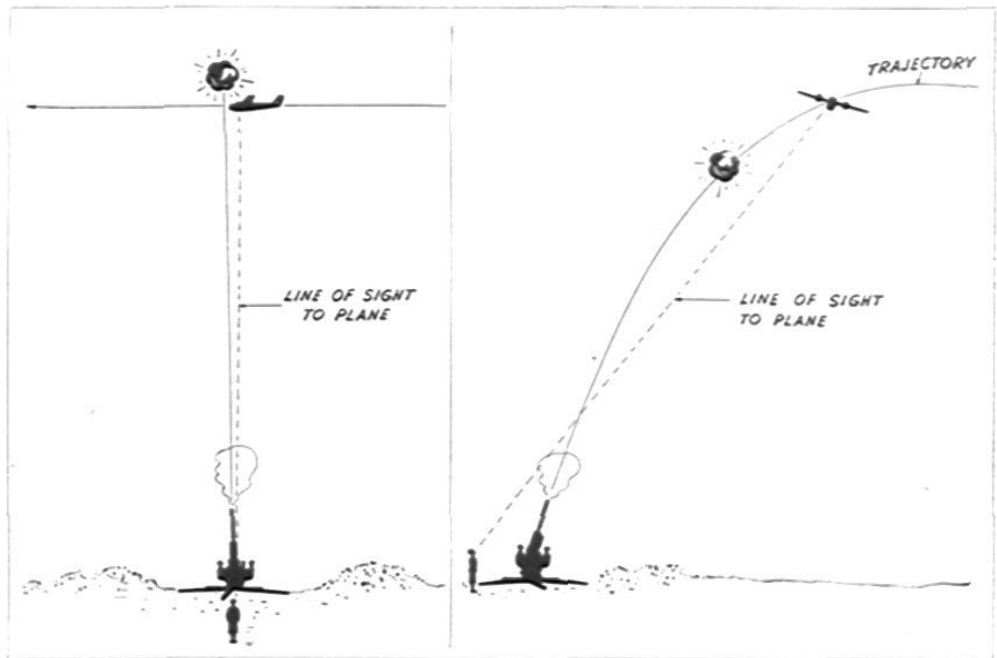


Figure 2a and 2b. Shown in Figure 2a is the optical illusion of a "high" burst created by a short-fuzed round from a 90-mm AA gun, as seen from a position behind the gun. At the right (in Figure 2b) the same situation is depicted, but from a position at right angles to the line of fire, showing that the burst occurred along the correct trajectory but short of the target.

were correct for direction. Consequently, unless you can arrange to be in two places at the same time or unless you can develop unlimited stereoscopic vision, you can't expect to become an accurate judge of AAA fire with the naked eye.

Now if you'll bear with me just a little while longer, I'd like to explain one more headache which may trouble you some of these days. Those fancy "mechanical brains" we use to figure out where we should shoot do have some limitations, and one of them is that they make predictions along straight lines. That being the case, you might see some funny-looking firing when a plane changes course abruptly. True, we keep our instruments on the target no matter how he twists and turns, but every time he makes a sudden change of direction there will be a number of bursts (from rounds which were "on the way" when that change was made) which will show up along the extension of the original course. That's true only for a few seconds, of course, but during those few seconds the firing may look pretty bad to you.

I know you'd like to be able to see for yourself just what's going on out there around the target, but unless you've got instruments to help you lick this three-dimensional stuff you might as well give up the idea. You'll find that we're always glad to have you watch the fireworks, and we like nothing better than to be able to drop a Jap in your lap—but don't get sore if we don't pay much attention to your criticism of our fire control.

That's all for now. Next time you're over I hope we can do better, but if we miss again I think you'll have a little better idea of just how the problem stacks up.

Sincerely,
JIM.

Tanks and tank destroyers in modern warfare reinforce artillery. Preventive maintenance reinforces all three.

Not in the BOOK

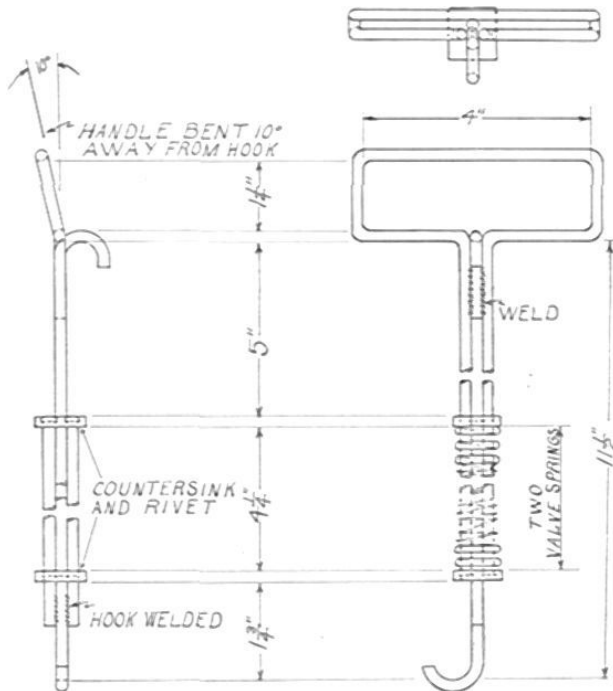
EDITOR'S NOTE: This feature is devoted to ideas sent in by our readers describing methods or devices which, though not specified by official literature, have proved useful in service.

A SECTION BOX SOLUTION

In our battery (a 155 M1 howitzer outfit) we believe that we have found an ideal solution for carrying our section boxes handy and neatly. There is, of course, no place provided for on the M1 to carry the chest. Up to now it was carried in the prime mover, where it not only took up valuable space but also was burdensome to unload every time we moved into position. After some experimentation we ran across this idea which was adopted by the whole battalion and which we pass along to you.

The Section Box fits neatly between the legs of the loading tray, laid crosswise. Legs of the loading tray prevent the box from slipping up or down along the length of the trail. The lower end of the fastener is hooked around the support that runs from the maneuvering handles and the trail. The upper hook is fastened onto the lifting handles of the section box, locking the box securely in place and preventing any side movement.

Upon occupying position it is only necessary to lift up on the



handle of the fastener and remove it from the box. Remove the chest from the trail and the operation is complete.

Materials used in the making of this fastener were obtained readily in our battalion area. The round stocks are the ever-present center rods from our powder clover leaves. Flat metal came from an old piece of 1/4 stock lying around. Springs are old valve springs that were picked up at Battalion Maintenance. All welding was done by Battalion Motor Section, and we were able to make about one an hour.

SGT. WILFRED K. ROBINSON AND T/4 DALE G. DULANEY

PITCH VERSUS PROFILE

To determine visibility between two terrain points the floating line method has been developed for interpreting air photos. Its magic can not be used on a contoured map. Although profile drawing is the classic means of ascertaining whether one point on the ground is visible from another, here is suggested the "Pitch" method—a

formula the application of which is quicker, simpler, and usually more accurate.

Drawing a profile is a rather tedious job. The "Pitch" method requires little time and no drawing.

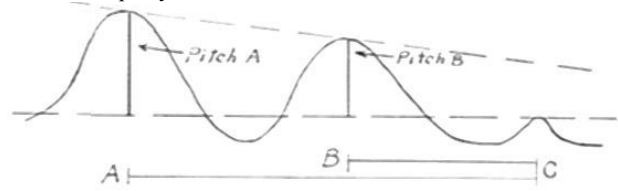
It might be said that a profile gives a cross-section picture of terrain, but this is rarely true. If a profile were to present a true picture of ground relief it would necessitate plotting altitude and horizontal distance in equal units, which is almost never the case.

Sometimes the user of a map can determine visibility or line of sight by inspection. For instance, between two high points with intervening low ground, visibility is obviously possible. Conversely, visibility is plainly impossible between two low points with intervening high ground. When attempting, however, to determine visibility between high and low ground where ground of medium altitude intervenes, a question arises which cannot be answered by inspection. The problem rests naturally upon the proportion between relative heights and distances.

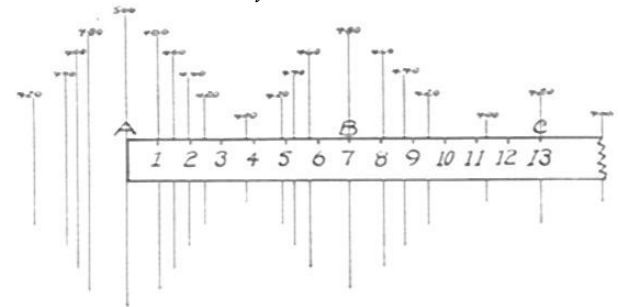
The following procedure is mathematically sound and very simple in application. For purposes of discussion let us call our high ground point A, medium ground point B, and low ground point C.

From contour lines determine the amount by which the altitudes of point A and B exceed that of point C. Call these values "Pitch A" and "Pitch B," respectively. Measure the map of distances between A and C and B and C. Call these AC and BC, respectively. These measurements may be made in inches, centimeters, or any convenient unit without consideration of map scale or actual ground distance, since the formula employs only numerical values and requires no relationship between the units of horizontal and vertical distances.

If $Pitch A \times distance BC$ is greater in numerical value than $Pitch B \times distance AC$, you have a line of sight between A and C. The converse is equally true. See sketch.



$Pitch A \times BC$ is less than $Pitch B \times AC$, therefore you do not have visibility between A and C.



$$\left. \begin{array}{l} Pitch A = 500 - 420 = 80 \text{ or } 8 \\ Pitch B = 480 - 420 = 60 \text{ or } 6 \end{array} \right\} \text{(any unit)}$$

$$\left. \begin{array}{l} Distance BC = 6 \\ Distance AC = 13 \end{array} \right\} \text{(any unit)}$$

$8 \times 6 = 48$; $6 \times 13 = 78$; therefore there is no line of sight between A and C.

LT. DAVID E. LEWIS, FA

Diary of War Events

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

JANUARY, 1945

- 1st Third Army troops gain up to six miles between Bastogne and St. Hubert.
Several hundred German planes fly over France, Belgium, and Netherlands; the first German sorties in about four years. 241 enemy planes shot down by allies.
France joins the United Nations.
Allied bombers fly deep into Luzon and attack shipping in Lingayen Guly.
- 2nd Russians beat back desperate German attempts to push reinforcements into Budapest.
British troops in Burma capture Kobo, 75 miles from Mandalay.
- 3d General Plastiras forms a new Greek Government described as liberal.
General MacArthur sent his aircraft against Luzon, sinking or setting afire 25 ships.
8th Air Force sets a new winter record of twelve consecutive days of bombing by showering 3,000 tons on more than 12 targets in Germany.
- 4th U.S. 1st Army advances 3½ miles on the Germans' northern flank. U.S. 3rd Army gains initiative on the southern flank and pushes nearer to St. Hubert.
U.S. naval forces in the Pacific sink 35 more Jap ships including 4 warships in Subic Bay and Lingayen Gulf. Pacific fliers raid Formosa and Okinawa for the 2nd straight day. Destroy or damage 331 planes and 83 ships during 2-day attack.
- 5th 1,500 U.S. bombers and fighters blast 20 supply and communications centers in western Germany.
U.S. troops in the Philippines occupy Marinduque Island, 25 miles east of Mindoro and within 12 miles of the Southern Luzon coast.
British and Indian forces capture Akyab without opposition.
- 6th President Roosevelt asks Congress for a national service law totally mobilizing our manpower and womanhood.
Allied tanks smash through German positions in the north and reach the Salm River.
U.S. B-29s bomb Tokyo and Nanking.
- 7th RAF bombers raid Munich following assaults by 1,000 8th Air Force "heavies" and 600 fighters.
German troops push Russians out of Esztergom, 19 miles from Budapest.
- 8th 8th Air Force bombs rail and road targets behind the Ardennes and Sarre fronts.
MacArthur's fliers bomb Manila, Clark, and Batangas airfields. Destroy 28 planes. Lose 3.
- 9th Gen. MacArthur leads U. S. troops in landing on Luzon. Gen. Krueger's 6th Army spearheads the landings along southern coast of Lingayen Gulf, 107 miles from Manila.
U.S. 1st Army grinds out a 2-mile advance on a 20-mile front along the northern side of the Belgian bulge.
- 10th U.S. troops liberate Lingayen and its airfield, Dagupan, San Fabian, and Mangaldan on Luzon.
U.S. fliers bomb Jap lead and zinc mines near Namtu, Burma.
- 11th U.S. troops occupy Labrador and secure the mouth of the Agno River. U.S. superfortresses from India bomb Singapore.
German troops withdraw from the western tip of their salient into Belgium. Allies capture LaRoche and 15 other towns. 3 of Gen. Patton's columns trap the Germans beyond Bastogne.
- 12th U.S. Pacific Fleet and carrier planes battle Jap convoys and installations in the French-Indo China area. Sink 41 ships, damage 28, destroy 112 planes, also destroy dock at Cam Ranh Bay. We lose 16 planes.
- 13th More than 1,400 U.S. heavy bombers blast the retreating Germans behind the battle lines and smash bridges over the Rhine.
U.S. 3rd Fleet's carrier planes raid Jap-held ports in China at Swatow, Amoy, and Hong Kong.
- MacArthur's troops advance 8 miles on Luzon.
- 14th Allied fliers destroy 243 German planes in a series of furious battles over Germany.
MacArthur's troops on Luzon gain 10 miles and establish a bridgehead across the Agno River near Bayambang.
U.S. B-29s smash industrial targets on Formosa.
- 15th Red Army in new offensive advances to within 51 miles of the German border.
2,000 Allied planes from Britain and Italy raid oil and rail targets from Vienna to the French border.
- 16th Norwegian troops advance 80 miles to join Russian forces, liberate east Finnmark and capture the German air base at Banak.
- 17th White Russian Army captures Warsaw.
- 18th War Department reports U.S. casualties on the western front during December to be 74,788. 10,419 killed, and 20,815 missing.
- 19th Russian Armies capture Cracow, 4th largest city of Poland. 100 B-29s bomb Kobe-Osaka industrial area, 250 miles south of Tokyo.
- 20th Russian troops advance 25 miles from Warsaw and capture the East Prussian industrial city of Tilsit.
1,000 U.S. heavy bombers supporting Allied armies blast rail targets in Germany and Austria.
President Roosevelt inaugurated as the Nation's 1st fourth term Chief Executive.
- 21st 900 8th Air Force bombers plus 500 fighters blast German rail system along the front.
Hungary surrenders to the Allies unconditionally and declares war on Germany.
6th Army on Luzon captures Tarlac.
- 22nd U.S. 9th Air Force destroys nearly 3,000 German conveyances and 127 tanks and armored cars retreating from the Ardennes salient.
U.S. troops on Luzon advance to within 10 miles of Clark Field and 54 miles from Manila.
Pacific Fleet planes destroy 140 Jap aircraft and damage shipping docks, airfields and industrial targets on Formosa.
Chinese troops capture Mues in Burma and complete the opening of the Ledo-Burma Road from India to China.
- 23d Allied planes wreck 2,000 more German vehicles retreating from the Ardennes salient.
Pacific Fleet carrier planes raid Okinawa, in the Ryukyus. B-29s bomb Nagoya. Destroy 62 planes. Lose 1 B-29.
- 24th Lt. Gen. Ben Lear leaves AGF to become deputy commander to Gen. Eisenhower. Gen. Stilwell succeeds Gen. Lear as AGF commander.
B-29s bomb Iwo Island.
- 25th U.S. troops on Luzon capture Clark Field and Fort Stosenburg-Pacific Fleet, superfortresses and Liberators raid Iwo Island in the Volcanos.
- 26th U.S. 7th Army pushes the Germans across the Moder River north of Strasbourg.
- 27th U.S. 3rd Army advances on the German frontier at 5 points-B-29s raid Tokyo and Saigon, in Indo-China. Destroy 75 Jap planes, lose 5.
U.S. troops in the Philippines capture Angeles.
- 28th 1st White Russian Army smashes 12 miles into Pomerania.
U.S. 3rd Army re-invades Germany south of St. Vith.
U.S. troops on Luzon capture San Fernando, 34 miles from Manila. In a fierce battle at San Manuel, the 25th Div. destroys 49 Jap tanks and kills 789 men.
B-29s bomb Iwo Island.
- 30th U.S. 1st and 3d Armies advance up to 4 miles into the Siegfried Line.
- 31st U.S. 8th Army captures Olongapo on Luzon.



For Heroism and Service



DISTINGUISHED SERVICE CROSS

Capt. ST. JULIEN P. ROSEMOND, 916 Ingram Bldg., Miami, Fla., for moving to a forward position and directing artillery fire upon the enemy, while pinned down by intense hostile machine gun and rifle fire in France on 11 Jun 44. On the occasion of many counterattacks, he repeatedly moved to a forward position to direct artillery fire.

LEGION OF MERIT

Col. CHARLES R. HUTCHISON, 2834 S. Columbus St., Arlington, Va.

Col. CHARLES W. LEIHY, 360 N. Michigan Ave., Chicago, Ill.

Col. JOHN M. RAYMOND, 985 Main St., Hamilton, Mass.

Lt. Col. JOHN B. ROUTH, 240 E. Delaware Pl., Chicago, Ill.

OAK LEAF CLUSTER TO SILVER STAR

(Posthumously)

2d Lt. MENDEL W. JACOBSON

T/4 ALLEN M. THOMPSON

1st Lt. WESTMORE WILLCOX, III

OAK LEAF CLUSTER TO SILVER STAR

Pvt. HENRY J. BOISSELLE, 249 Monroe St., Brooklyn, N. Y.

Capt. THOMAS M. BRETT, 1302 Bixby St., Ardmore, Okla.

Pvt. TUDOR O. DAUDIER, 100 Robert St., Bridgeport, Conn.

Capt. EDWARD H. DEY, 423 E. 14th St., Sedalia, Mo.

1st Lt. MERRILL S. FERRARA, 49 S. Rock Ave., New Orleans, La.

2d Lt. GEORGE W. FLAGER, 115 W. Haller St., Lima, Ohio.

Maj. DONALD A. HEATH, 8 Iregradiam Rd., Wellesley, Mass.

Cpl. MICHAEL HRYNIAK, Hillsville, Pa.

Pfc. WALTER M. JABLONSKI, 781 N. Division St., Buffalo, N. Y.

Capt. KENNETH E. RICHARDS, 1301 N. Third St., Durant, Okla.

Sgt. ALDO ROLLI, 557 Hillside Blvd., New Hyde Park, N. Y.

Pfc. WILLIAM J. SCHULTZ, 404 Degraw St., Brooklyn, N. Y.

T/Sgt. STANISLAW J. SNIESZKO, 39 Holyoke St., Northampton, Mass.

Lt. Col. ARTHUR SNYDER, 19 Lafayette Ave., Hingham, Mass.

Lt. CHARLES C. STANABACK, 12392 Stoepel Ave., Detroit, Mich.

1st Lt. WILLIAM E. SULLIVAN, Mize, Miss.

Capt. LEMUEL D. THOMAS, JR., Box 236, Ringling, Okla.

Sgt. OTIS L. TOMPKINS, RFD 1, Sentinel, Okla.

SILVER STAR

(Posthumously)

T/4 JOHN E. AYERS

Pfc. CHARLES W. BROWN

2d Lt. ALVA A. CONLEY

1st Lt. DONALD N. HEWITT

Sgt. JOHN P. READY

SILVER STAR

Capt. JAMES M. BATES, Centerville, Tenn.

Pvt. MELVIN P. BENNETT, 5514 Bartlett St., Pittsburgh, Pa.

1st Lt. ROSCOE C. BRAND, 1802 Norton Pl., Steubenville, Ohio.

1st Lt. KENNETH A. BRYANT, 758 NW Ninth Ave., Gainesville, Fla.

Capt. BEARD CLARKSON

1st Lt. B. B. DARNELL, RFD 2, Notasulga, Ala.

T/5 HASKELL HAIT, 52 Buchan, Rochester, N. Y.

Capt. DON O. HART, 608 E. 32d St., Andalusia, Ala.

Pfc. ROY C. JOHNSON, RFD 1, Alto, Mich.

Pfc. ERNEST B. LOVEALL, Wilson, Okla.

1st Lt. JOHN F. PATTERSON, JR., Boston Post Rd., Noroton, Conn.

Pfc. CHARLES A. THOMPSON, 737 Park St., Gainesville, Ga.

1st Lt. ALLEN WALKER, 1925 50th Ave., Oakland, Calif.

Capt. ANTHONY I. WELLS, 135 Spring Glen Terrace, Hamden, Conn.

2d Lt. RUDOLPH WENTLAND, 2740 N. Sawyer Ave., Chicago, Ill.

ROLL OF HONOR

Lt. CHARLES O. ALBERTSON, O-1173524, killed in action 3 Jul 44. France.

Capt. JOHN W. ASKREN, O-365655, died 1 Jul 44. Southwest Pacific Area.

Lt. JOHN D. BENEDICT, died 25 Aug 44. France.

Col. HAROLD G. BROWNE, killed in action 24 Jun 44. Southwest Pacific Area.

Col. LEON R. COLE, died 2 Jan 45. Atlanta, Ga.

Maj. FRANK M. DORAN, O-282923, killed in action 12 Jul 44. Italy.

Lt. HENRY FRENTZ, JR., O-1169113, killed in action 8 Aug 44. France.

Lt. JOSEPH C. HESS, O-1287175, killed in action 29 Aug 44. France.

Capt. ARTHUR J. HOWLAND, killed in action 27 Aug 44. France.

Pvt. DAVID R. KELTNER, died in action 13 Oct 44. Pacific Area.

Lt. HOWARD M. KENYON, O-1180232, killed in action 14 Sep 44. Germany.

Brig. Gen. ALLAN C. McBRIDE, died 9 May 44 in Japanese prison camp. Formosa.

Lt. JAMES F. McGRATH, JR., killed in action 28 Jun 44. Italy.

Lt. JOHN J. MADISON, died 29 Sep 44 at Fort Dix, N.J.

Maj. RICHARD B. RIPPEY, O-384636, killed in action 28 Jul 44. France.

Lt. STANLEY F. RZONCA, died 16 Sep 44. European Theater.

Cpl. D. CARMEN SANT, killed in action 29 Jun 44. European Theater.

Capt. FELIX B. SETTLEMIRE, killed in action 20 Jun 44. France.

Lt. Col. WILLIAM SHADE, O-24443, died 13 Nov 44. France.

Lt. BURL L. STOREY, O-1181155, killed 12 Sep 44. France.

Maj. MORTON L. TALLEY, O-336771, died 26 Jul 44. Pacific Area.

Lt. DARWIN D. WARNER, died 22 Aug 44. Southwest Pacific Area.

Lt. GEORGE A. WHELAN, O-514734, killed in action 9 Aug 44. France.

Maj. ARTHUR B. WORTHMAN, died 14 Nov 44. American Area.

BOOK REVIEWS



THE ART OF WAR ON LAND. By Lt.-Col. Alfred H. Burne, D.S.O., R.A. (Retired). 224 pp.; index; sketch maps. London: Methuen & Co., Ltd. 10/6.

In the last year or so several books on the principles and art of war have been published. Among the best was *Framework of Battle*, by a retired American field artilleryman, Lt. Col. John G. Burr. Now a British gunner comes along with a book every whit as good.

Lt.-Col. Burne, the distinguished editor of *The Gunner* magazine, takes a good look at what wins wars. First of all he discusses the principles of war and the elements of strategy. From there he proceeds to examine a series of the world's outstanding campaigns and battles. Not all that he chooses are among the best known. One result, then, is that the reader or student imbibes some excellent world history along with the military aspects. Clear sketch maps are an immense help in following the descriptions and discussion, rounding out an excellent volume.

Unfortunately the English edition is nearly exhausted and no American one is definitely in preparation. One should be, and when it appears the fact will certainly be made known in these pages.

THE U. S. A. AT WAR: U. S. Camera 1945. Photographs judged by Comdr. Edward Steichen, USNR; edited by Tom Maloney. 304 pp. Duell, Sloan & Pearce. \$4.50.

Annually for many years the magazine *U. S. Camera* has gathered the best of the year's photographs into its *Annual* book. This year's pictures are all war photographs—taken by the country's best photographers with the armed forces, and selected by perhaps the greatest of them all. They are grouped to tell the stories of Tarawa and Salerno-to-Anzio; of Bougainville, New Britain, and Rabaul, and of the Marshalls; of the Central Pacific war; MacArthur's New Guinea leapfrogs; the Battle of France. . . . Not a phase of the war is overlooked: supply and logistics photograph as well as does combat itself. A most considerate thought was the devotion of a section as a memorial to Sgt. John Bushemi, an artilleryman who developed into one of the finest of photographers and who was killed at Eniwetok.

Many of these photos will be familiar to you, as a number have had wide publicity. Others are new to this reviewer. Together they form a magnificent pictorial record of roughly the calendar year 1944. Nowhere else will they be found so well reproduced, so clear and distinct in large size.

BATTLE REPORT: Pearl Harbor to Coral Sea. By Comdr. Walter Karig, USNR, and Lt. Welbourn Kelley, USNR. 487 pp.; index; illustrated. Farrar & Rinchart, Inc. \$3.50.

These authors make a specific statement that their work is unofficial. Perhaps so—but it is very, very close to being an official report. It was prepared at the specific order of the late Secretary Frank Knox, and is drawn from official sources. Much of its content is here made public for the first time.

This is the story of our Navy in its most dangerous and vulnerable period in all its history—the six months following Pearl Harbor. It is the period of the greatest risks—calculated risks, but still much greater ones than anyone wished to take. Much of the tale is told in the words of participants themselves. The rest of the text flows with the sweep and power of an epic. Maps detail the movements and progress of the major engagements, and a large number of official photos show damage suffered and damage delivered, as well as how the Navy went about much of its work, from salvage to succor.

Most important and interesting is the wealth of detail presented here: names of ships, precise damage accounts, appraisal of actions. The fact that such matters can be released while the war is still in progress is in itself a tribute to the strides taken in the last three years. It also shows a refreshing official willingness to release all possible information at the earliest feasible time. Other projected volumes will cover the Navy's war in the Atlantic, and Pacific operations subsequent to the Coral Sea; we look forward to them eagerly.

FIGHTING GENERALS. By Lt. Gen. Robert Lee Bullard, USA, Ret. 325 pp.; index; illustrated. J. W. Edwards. \$5.00.

In World War I Gen. Bullard led the 1st Division through Cantigny, then commanded our Second Army. In the course of his long military service (1881-1925) he came to know well many of the leaders of the last war. From his close acquaintanceship he was able to set down most unusual biographies of a number of them—accounts much more accurate and lifelike than any professional "biographer" might conjure up.

He recently presented the Army War College Library with the manuscripts of seven of these biographies, his accounts and estimates of seven major generals of the last war: Joseph T. Dickman, Hanson E. Ely, Henry T. Allen, U. G. McAlexander, Preston Brown, William G. Haan, and John F. O'Ryan. Col. Adelno Gibson, War College Librarian, rightly felt that these should be made generally available; the present volume is the result of his efforts.

Here we find not only Gen. Bullard's penetrating assayal, but also a large collection of highly appropriate photographs. These are so grouped as to illustrate many of the highlights of the careers of the officers described. They will recall nostalgic memories to all who knew the "old army," and be of great interest to all who are interested in it.

THE WAR IN MAPS. Text by Francis Brown. 167 pp.; maps. Oxford University Press. \$2.00.

It was in 1942 that this collection of *New York Times* maps was first published. Now in timely fashion comes the third revised edition, brought up to date to mid-1944.

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the facts behind these events. This combination is a remarkable achievement in making clear the complexities that are often so hard to follow in the daily news dispatches.

SO SORRY—NO PEACE. By Royal Arch Gunnison. 272 pp. The Viking Press. \$3.00.

UNTIL THEY EAT STONES. By Russell Brines. 329 pp.; index. J. B. Lippincott Co. \$3.00.

These two books are excellent complements. Gunnison's *So Sorry—No Peace* is almost entirely taken up with the daily routine of interned civilians in Manila and Shanghai. The story is pretty much what we have gathered from the newspapers: minor oppressions sometimes flaring into major cruelties; drab, ill-nourished days which wreck the spirit and ruin the body. How the prisoners organized their camps, how they scrounged food, and how they entertained themselves are perhaps the most interesting portions of the book. Gunnison makes the inevitable attempt to explain the reasons for the war, and how we should deal with Japan. This forms the least convincing portion of the book.

Brines in his *Until They Eat Stones* deals cursorily with the prison routine which Gunnison treats at length, and then launches into a long, intelligent discussion of pre- and post-war Japan. Brines thinks that this war is merely an opening gambit on the part of Japan's militarists. If they win the game—fine; if they don't, well, what's a hundred years in the life of an empire?

This opinion is bolstered by cogent reasoning. Brines thinks that win or draw, the United States is faced with tremendous responsibilities, for we will have to bear, with Great Britain, the burden of revitalizing the conquered territories. If we fail in the slightest degree, the political machinery which Japan will leave behind will make every effort to implement the Greater East Asia Co-prosperity Sphere.

A grim picture indeed, and probably not right in all its perspectives. It's a picture we must look at, however, if we would avoid World War III. R. G. M.

THE WORLD OF WASHINGTON IRVING. By Van Wyck Brooks. 483 pp.; index. The Blakiston Co. \$3.75.

In the days of Washington Irving—roughly from 1800 to the early '40s—American literature was having its beginnings. Philadelphia was the center of our culture, New England's time was yet to come. The South ignored book-writing. And the West was too busy with the ferment of growth and expansion to produce writings of its own. By this I don't mean, however, that this book is devoted to Philadelphia alone. I merely want to thumbnail the situation then existing.

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All this is integrated with the political and social events of the time. These things, of course, inevitably influenced the writers themselves. The result is a smooth-flowing narrative which greatly enlightens one concerning this period of American growth.

MANY A WATCHFUL NIGHT. By Lt. John Mason Brown, USNR. 218 pp.; illustrated. Whittlesey House. \$2.75.

It may sound strange, but a background as a drama critic is an excellent asset for a war correspondent. Brooks Atkinson, formerly of the *Times*, has proved that from China. Lt. Brown, late of the *World Telegram*, did the same thing in his *To All Hands*. His latest book even surpasses that first one.

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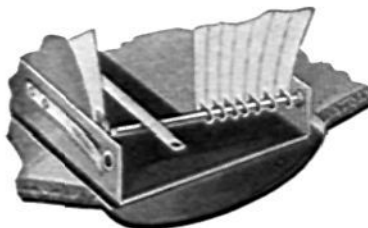


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AND NOW TO LIVE AGAIN. By Betsy Barton. 150 pp. D. Appleton-Century Co. \$1.75.

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C. P.

THE SPIRIT OF RUSSIAN ECONOMICS. By Dr. J. F. Normano. 162 pp.; index. John Day Co. \$2.00.

This book is short, but packed full of facts. Its theme is to show that the present development of Russia was prepared for more than a century ago. It seeks to show that Bolshevism, or Communism, has been the logical development of past events in Russian history, and is not a new political conception imposed by force. This does not alter the fact that although the idea may have been old, force was used (and was necessary) to get the new government into working shape.

The present Russian Government, Communist in name but not now a pure Communism, early recognized that in order to be politically independent it would have to be technologically and economically independent. With this objective in mind it has faithfully labored for the past twenty years. No one will deny that it has made remarkable progress. It will presumably continue to strengthen itself in this direction during future years.

Dr. Normano's book is not a study of Russian economics. It is a discussion and listing of past Russian economists, with particular reference to what foreign nation influenced their ideas. It is shown that in Napoleon's time there was considerable anti-French feeling in Russia. This led to turning to England for both trade and culture. Later French influence reasserted itself. Last came the German influence. Many Russian students went to German universities, and particularly to Goettingen, whose economics courses strongly influenced Russian procedure. A true Russian school did not appear until the beginning of this century.

This book will be most useful to a student of the history of Russian economics. It would be only of minor value to a purely military reader.

C. H. L.

RED STAR OVER CHINA. By Edgar Snow. 514 pp.; index. Modern Library. 95c.

Here is a fascinating reprint. This excellent account of Red China needs pages and pages to be adequately reviewed, for it touches on political, military, social, and economic problems that cannot be covered in a few lines. For our purposes it is perhaps best to leave the political, social, and economic sides of the book with the remark that Snow is scrupulously honest in reporting what *he saw* of these very vexing and muddled phases of Chinese life. There is no wishful thinking, innuendo, or anything of the sort in his report.

The military side of the book is fantastic, and as much neglected as the campaigns of Suvorov in the eighteenth century. The bare

statistics of the retreat of the Chinese Reds across half of China are astounding. During the 6,000-mile retreat they averaged nearly 24 miles between halts while crossing 18 mountain ranges, 24 rivers, and 12 provinces. They occupied 62 cities, broke through 10 different provincial armies while defeating and cluding the various forces of the Central Government. They had a skirmish a day, and had 15 whole days of major pitched battles. "Out of a total of 368 days en route, 235 were consumed in marches by day, and 18 in marches by night. Of the 100 days of halts . . . 56 days were spent in northwestern Szechuan, leaving only 44 days of rest over a distance of about 5,000 miles, or an average of one halt for every 114 miles of marching."

The details of this Long March make fascinating reading. This is truly an extraordinary book. I have read it three times now, and am looking forward to the fourth reading with undiminished pleasure. R. G. M.

WHERE AWAY. By George Sessions Perry and Isabel Leighton. 249 pp.; illustrated. Whittlesey House. \$2.75.

Both these authors have taken the Navy as their province in writing during this war. Both are seasoned authors; their names are familiar to magazine readers as well as to book followers. This experience at integration stands them in good stead in the telling of the saga of the *Marblehead*, that grand old cruiser whose journey around the world in search of a drydock is one of the most amazing yet to be released. The whole is made more graphic by the excellent pen-and-ink sketches of John J. Floherty, Jr.

INVASION JOURNAL. By Richard L. Tobin. 223 pp. E. P. Dutton & Co. \$2.00.

Invasion Journal is the story of the men who made the invasion of France possible—not the leaders not the planners but the men who executed the plans and obeyed the orders. It is the story of the ordinary soldier from the time he slipped silently away from the port of embarkation in the United States until he swept the last of the German armies from the Brittany peninsula.

It is a vivid picture told by a veteran newspaperman in the best of newspaper feature style. A master storyteller, Tobin has liberally sprinkled his narrative with good jokes and pointed human interest stories. His day-to-day account of his adventures should be especially interesting to anyone who has made or who expects to follow up *The Invasion*. R. N. G.

THE AVIATION ANNUAL OF 1945. Edited by Reginald M. Cleveland and Frederick P. Graham. 200 pp.; index; illustrated. Doubleday, Doran & Co. \$3.75.

This book, devoted only to American aviation, is a survey of the period from the late summer of 1943 to the summer of 1944, with some consideration of the post-war period. It is divided into sections on service aviation, manufacturing, post-war problems, the airplane of the future, commercial and private flying, and it includes a directory of aviation firms and a bibliography of aviation books published between July 1943 and June 1944.

The jacket states that the book "is ideal for the child in school, the aircraft worker, and the general layman." Perhaps the attempt to appeal to such varied tastes is responsible for a text which at times is simply an empty paen of praise for American aviation but which every now and then contains sensible statements reminiscent of the competent columns once contributed by the editors of this volume to *The New York Times*.

The sections in the volume which are the best written deal with manufacturing, the commercial airlines, and the post-war period. The discussion of tomorrow's airplane is especially good and displays a common-sense approach to a speculative subject.

Readers of this JOURNAL will probably find the discussion of military and naval aviation least satisfactory of all the sections. There is an introductory statement that the debate about air power as an independent weapon has been terminated by the lesson that the strongest force is integrated surface and air power. Instead of reviewing the events of the period in relation to this statement, the authors merely turned out the familiar outline of air operations which produces the usual out-of-focus picture of the war. This is, of course, a defect in all books which depict aerial warfare in a vacuum but it is especially disappointing here as it is obvious that these editors had a glimmering of a worthwhile thesis. J. R. C.

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THE VIGIL OF A NATION. By Lin Yutang. 256 pp.; index; illustrations. The John Day Co. \$2.75.

Lin Yutang is China's most articulate spokesman in English. His several books in our language give us some of our greatest understanding of his native country. News accounts and other reports have been conflicting and often disconcerting, however, so in September, 1943, he started a six-month trip to see for himself what conditions were, to talk in person with leaders and with common men, with soldiers and with prisoners.

No foreigner could have hoped to penetrate the fog of war, gossip, and conflicting interests as could he. Besides a spirit of inquiry, Lin Yutang has a sense of history. Thus he felt and saw Old China as well as the New. And being a member of neither party (Kuomintang or Communist), he was in a position to have free talks with all groups.

In the course of a seven-province trip by plane, train, truck, and boat, he looked into politics and economics, industry and education, literature and transportation. Most of all, however, he tried to get at the truth about China's civil war. In line with the importance of this problem, it receives a considerable amount of attention; in fact, this theme is woven pretty well throughout the book. It is apparent that Lin Yutang is first of all a Chinese; his investigation is objective, his report factual. From his account the conclusion is inescapable that much of the responsibility for this conflict lies with the Communists.

All conclusions of the author are held over to an excellent final chapter, in which he considers the future. Headings are democracy, unity, the army, and industrialization. The appraisal is excellent. And it is good to be able to say that this astute man's confidence in China is unshaken. The people's strength will count for more than its weakness. That is a fine thing to say of any country.

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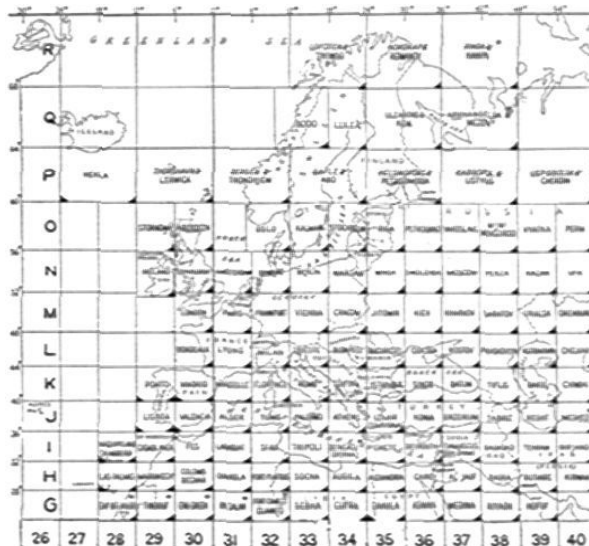
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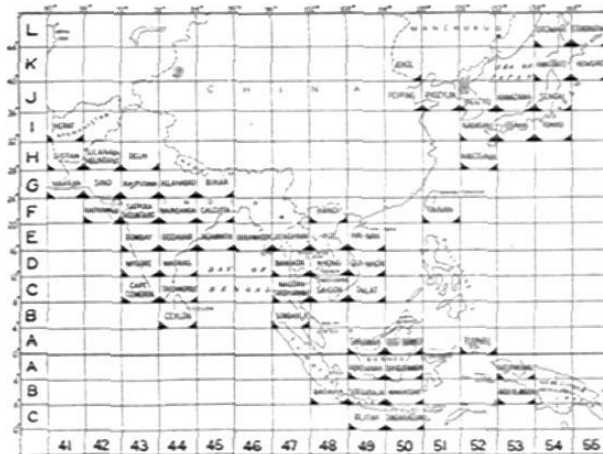
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Many styles, tastes, and fashions are represented among these novels. The oldest (*A Beleaguered City*, by Mrs. Oliphant) was first published in 1880, whereas Robert Nathan's *Portrait of Jennie* was copyrighted in 1939. In between are *The Return* by Walter de la Mare (1922), *The White People*, by Frances Hodgson Burnett (1917), Arthur Machen's *The Terror* (1917), and Mary Johnston's *Sweet Rocket* (1920). Each has a short editor's preface which serves several purposes: it sketches the author, evaluates his work, suggests other books written in similar or related vein, generally helps orient the reader before he plunges into the eerie and the weird.

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