The FIELD ARTILLERY Journal

JUNE, 1944

Field Artillery Guide

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—Lt., FA, in combat in the Southwest Pacific Area

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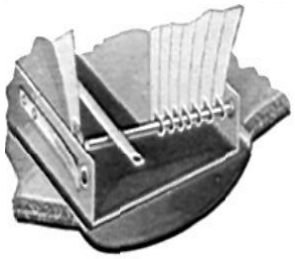

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1218 Connecticut Avenue, N. W. Washington 6, D. C.

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DESPITE THE NUMBER of enlisted men who are members of the U. S. Field Artillery Assn., we learn that a good many others have the impression that this is solely an officers' organization. Although under our constitution that is true in time of peace, in time of war *all* artillerymen are eligible to membership and all its benefits.

With the field of artillery in general so greatly broadened in this war, we welcome into the fold all personnel (enlisted and officer) who might benefit from our JOURNAL and our facilities. These include those with the field artillery proper, of course, and also members of TD units, the armored force, cannon companies—in fact, any and all who deal in any way with larger-than-small-arms or who are interested in them.

Not only are enlisted men eligible for membership. We are definitely anxious to receive articles from them. Their approach to problems is always a practical one. They have developed or started the development of some of this war's finest and most useful short-cuts and devices. We are as interested in their narratives as in those of any one else.

You are all eligible for membership, in which both you and we take pride.

WITH INCREASED TEMPO of military activity everywhere, we would remind commanders to forward to us their operations accounts, even though they be carbons of reports. Some of these may not be publishable now, but will be of inestimable value to the Arm for later publication.

The Field Artillery Journal

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

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240s

For prime movers abroad, old M-3 medium tanks with turrets removed are being used; although encumbered with armor that is not needed in this situation, they develop ample power for hauling over steep grades and cross-country into final positions. After clam-shelling the spade and recoil pits, the battery crane lowers the piece into position. Aiming circle shown here is equipped with night-lighting device. Extent of the ground tremor is indicated by dust kicked up even by the trails, in the remarkably clear photo at right; lanyard can be seen curling off the right of the picture. Cannoneer No. 1 of the camouflaged piece stood on right trail when pulling lanyard; notice the varied reactions of personnel standing on the carriage.

IN ITALY

WHEN IN ROME

By Maj. Ernest J. Whitaker, FA

These comments are made as a result of several months' service in the Italian campaign (Nov-Mar) with an Armd Arty Bn and with an Armd FA Gp Hq. These personal views may not be agreed with by all; however, it is hoped that they may be of some benefit to those who have not yet seen combat service.

BASIC TRAINING AND SCHOOL OF THE SOLDIER

This phase of training is most important. The soldier must wash and shave, wear the uniform properly and keep as neat and clean as possible, care for his equipment, and look after his person without having someone constantly check on him. If it is necessary for officers and non-coms to spend time checking on these matters, the battle efficiency of the unit is cut down accordingly.

Let us take a specific example. During the rainy season, many soldiers left gas masks lying around in such exposed places that the canisters became wet. This of course rendered many masks useless, and resulted in the necessity of a battalion check of all masks and the replacement of many. Had there been a gas attack there would have been no need of replacing the useless masks, needless to say.

Field sanitation measures must be carefully adhered to, especially with respect to drinking water and proper disposal of human excreta.

RSOP

The Sill methods apply very well, with the addition that it is often necessary to add a minesweeping-of-position phase. German mines and booby traps are numerous and of many types. They are usually found adjacent to roads, but also in possible position and OP areas. Positions previously occupied by our troops are usually safe—but not always.

To avoid shelling it is best to try for a position off the main roads and away from road intersections. In one instance a battalion position in the flat (but with just enough defilade to cover activity) and away from the main axis, attracted very little enemy fire although only 3,000 yards from the front lines. As a result of shelling many casualties occur around the kitchen area; mess lines should be avoided.

FIRE DIRECTION

FM 6-40 cannot be studied and taught too much. Metro, map, and survey *K* are used constantly and *all* FDC personnel should know all the fine points about their use. One battalion on first going into action used a British metro by making certain conversions, and figured a metro every 4 hours, 24 hours a day.

The battalion FDC must be so organized as to operate on a 24-hour basis. Records of ammunition expenditures must be kept accurately and up to date, and records of missions fired become a part of the daily S-3 report.

Vertical control is necessary, especially in country like Italy where missions with 200 to 300 yards of site are not uncommon.

One battalion established two OPs on a particular mountain, surveyed them in, and used them at night as flash location stations. Having wire laid between them, the OPs were able to coordinate observations on the same targets and obtain very accurate locations.

FOS AND OP PERSONNEL

These people do not get enough training as a general rule. Of course their main duty is to shoot, and they usually do this all right. Precision methods are important due to many point targets which appear, such as dugouts, antitank guns, mortars, etc. Nebelwerfers rate at least a battalion concentration.

Training in observing and reporting correct coordinates should be stressed. Too often targets are reported by coordinates, and then shifts of several thousands of yards made before fire for effect.

These people are also the main source of the artillery information service. They should know how to report observations of activity with respect to what, when, where, and any peculiar circumstances, and should realize the importance of positive and definite observations. On a particular occasion, certain observers were asked to make sworn statements of their observations due to the importance of a certain enemy activity.

It has been suggested that firing a ladder discloses the battery's position to the enemy; a possible remedy is to have the observer make range changes by sensings which show him the G-T line. Of course, most of the missions fired during action periods come from FOs. But OPs are still useful, and often acquire an added responsibility by acting as relay stations for radio communication, which is often difficult to maintain in such mountainous country as Italy. During lulls and stable situations, OPs are the main source of fire missions.

ANTIAIRCRAFT PROTECTION

Recognition of enemy aircraft is important, although of late few German planes venture within ground observation recognition range. In recognition training, contrasts of similar planes should be stressed.

Troops should know the capabilities and limitations of their AA weapons. Too often machine guns are fired at planes at impossible ranges. This not only uselessly discloses our positions but endangers friendly troops with spent bullets.

The density of AA artillery weapons is usually sufficient to handle the enemy aircraft attack, unless, of course, the planes are attempting to strafe a position or column, at which time machine gun fire from that position or column cannot be too intense. On two known occasions German reconnaissance planes flew over our lines at high altitudes and were greeted by intense AA fire, including machine gun fire which could not hope to reach them, as they came over a mountain close to the front; immediately turned and went home; were followed in several hours by heavy caliber artillery fire. It is an uncomfortable feeling to be a concentration number on a German FDC chart.

S-2

S-2 is an important man in combat. He should get more consideration during training. Since he is responsible for enemy intelligence and information, and since most of his first hand intelligence information comes from FOs, OPs, and liaison officers, he should be given some sort of control over

these people, either direct or supervisory. He should realize that the bits of information which he may get will all fit into a bigger picture at higher headquarters, and that he should make every effort to get all he can and to send it on through intelligence channels at once.

S-2 is also a counterbattery officer, not only for his own unit but also for the supported infantry units. He must become familiar with Shellreps and enemy artillery methods and calibers. By adopting an aggressive, active policy, he can save his units a lot of grief, for our counterbattery methods and system have proven most efficient.

MISCELLANEOUS

Wire Crews

The amount of wire lying along the roads near the front is amazing. In some sections, an estimate of 100 miles of wire per square mile would be conservative. Wire crews work day and night, as the wire is always going out due to shell fire, tanks, trucks, and other reasons. One Armd Bn (TBA equipment: 10 miles of wire) at one time laid and serviced over 50 miles of wire over some of the roughest country possible during the rainy season. At another time, a wire crew was issued several mules for use in laying and servicing wire in the mountains. The mules were also used in supplying the FOs and OPs. Imagine entering an Armd FA Bn bivouac area and finding a mule park!

Antitank Guns

There has been no occasion to use them.

Alternate Positions

Alternate positions are important, and occasionally an outfit is forced to occupy one because its original position becomes too "hot." Sometimes, however, there are so many other artillery units and troop installations around that the only protection is to dig in—there just is no place else to go.

Ammunition Supply

There has been no ammunition supply problem, although muddy roads often have made hauling difficult.

Explanation of Title

We are not in Rome as yet, although always "on the Road to Rome." "When in Rome, do as the Romans" applies, however, to the employment of Armd FA units as straight FA units when conditions make it necessary. Although trained for fast moving situations, rapid occupations, and primary dependence on radio for communications, fighting in Italy has made other methods necessary. Field Artillery is Field Artillery no matter what the specialization.

CARE OF SEPARATE LOADING AMMUNITION

By Capt. Edward G. Seidel, FA

If you have ever seen one of your battery ammunition dumps go up in flames, you will agree that once is more than enough. Yet, the question of preventing such blazes when the battery is being subjected to heavy and prolonged counterbattery fire is one which we have found tough. Our only consolation is that the enemy too seems to have the same problem, to judge from the number of fires which we have observed during our own counterbattery fire against him.

The big bugaboo is the powder. Shells of their own accord are not likely to be set off by enemy action unless he first ignites a powder dump which in turn detonates nearby shells because of the intense heat. Primers and fuzes have not proven to be very combustible under shellfire, either.

But powder has been another matter. Three times to date we have seen stacks of our powder go up in a hurry with little damage to the enemy when one of his shells landed too close. The first time was disastrous. The powder dump was to the rear of one of our pieces and a pile of shells was equidistant between the two. That day the wind was blowing from powder to shells to piece. When the powder flared up the wind carried the heat to the shells and soon they started bursting. When it was all over we counted ourselves lucky to have no casualties among personnel, but one piece had been virtually ruined by the intense heat and fragments, the battalion area had been peppered with fragments (many large enough to knock a man to glory), and much ammunition was gone.

Our second experience was not so bad as the first, but the blaze did ruin two nice 12×20.00 tires on one piece, and a trailer load of barracks bags (containing all the extra clothing and equipment of two sections) went up in smoke. Lucky again; no casualties.

The third time we lost a truck which had been parked about 70 yards from the powder dump. All hands safe again.

Here are some conclusions from these experiences, all learned the hard, expensive way:

1. Keep powder and shell dumps *well* scattered (the ten yards prescribed in FM 6-40 will not prevent the fire from spreading if there is any wind).

2. Keep the amount of ammunition in each dump small (we agree with FM 6-40 on these amounts. See par. 14 of that manual).

3. If you can, dig pits for the powder. If that is impractical (in the mud and rain of Italy's fall and winter, for instance), construct sandbag or dirt embankments around the powder so that if it does burn the blazing particles of powder cannot be spread laterally.

4. Keep your equipment and installations well away from the powder dumps. A moderate breeze will carry the flames as far as 50 yards.

5. Have a well-established SOP in case of fire, so that all installations are immediately manned by sufficient personnel to put out small blazes started by flaming particles of powder which will fly a long way. Camouflage nets are particularly vulnerable to such fires.

ACTIVE AIR OPs

From Italy, Lt. N. S. P. Stitt (whose article was published on p. 280 of this JOURNAL for May, 1944) writes further:

"I have passed the hundred mark for combat missions and find that our time per flight averages an hour and eighteen minutes, and that we have also averaged one target fired upon (including registrations) for every two flights."

Apparently general surveillance missions form a good part of the "grasshoppers'" work in that area.

PULLING TOGETHER

By Maj. Edward A. Raymond, FA

Through the years of peace much was said of the need for cooperation and coordination among arms and services. This war has put those principles into operation. In fact, they have gone far beyond anything previously envisioned: they apply not only among the several ground elements, but also include air and naval dovetailing with ground operations—and now are international in scope. To speak of artillery, Tunisia found American units at times serving with and sometimes under British gunners; the French received our weapons, which they used with their own accustomed technique; now Italian elements are actively engaged on the side of the United Nations.

In the months to come there will doubtless be ever increasing intermingling among artillerymen of different nations. Some operations may require use of all available guns, and these will be served and directed by men of different nations which have been thoroughly trained—but in different methods. Naval gunners will be accustomed to a different procedure from that used by the ground troops of their own nation. And air-ground systems likewise vary.

Perhaps in time some standard method of conducting fire (particularly by forward observers) will be evolved. Now, however, we must work with the tools at hand. For effective use of artillery in forthcoming operations we must know and thoroughly understand the methods currently in use by the several groups that must work together, that must pull together for the common good.

This is particularly the case with forward (and air) observation methods. *Eight* different forward observer methods are now in use by the United Nations! Those did not just grow, like Topsy: each has its advantages and disadvantages, its own good reasons for being as it is. The important thing is for us to know what the methods are and how they work, so that in any given situation we can make the most efficient use of the facilities at hand.

General Differences

Current air and FO methods can be viewed as being based on sensings with respect to the G-T line or with respect to magnetic north. In some methods the observers use commands, in others sensings. A table would look like this:

FO METHODS

	GT line	*North-South line*
Commands	U. S. Navy British Army (OP Method) RAF Arty/R #1	British Army (FOO) RAF Arty/R #2
Sensings	U. S. AAF & FA	Italian Army (Air-Ground) British Navy French Army (Air-Ground)

Differences in Detail

Using GT Line and Commands
U. S. Navy Method

Up, Down, in range in yards.[1]
Right, Left, in yards.

Disadvantage: Reverses sequence of commands used by terrestrial artillery (U. S., Br., and Fr.), but done because it takes more time to lay naval guns in elevation than deflection.

British Army OP Method

Less (left), More (right), in degrees and minutes.
Add, Drop, in yards.

Advantage: Used by British FOOs (Forward Observation Officers) when they can visualize G-T line, in order to save ammunition.

Disadvantages: 1. Construction of British sights reverses the American and French rule of left add, right subtract. This would lead to confusion.

2. Use of degrees and minutes is a British practice only.

RAF Artillery Reconnaissance (*Arty/R*)*—Procedure #1* (*when firing 1 battery*)

Right, Left, in yards.
Add, Drop, in range in hundreds of yards.

Advantage: Used when firing a single battery, for speed of adjustment.

Using GT Line and Sensings
U. S. FA Forward Observer and AAF Method

Right, Left, in yards.
Over, Short, in yards.

Using N-S Line and Commands
British Army FOO Method and RAF Arty/R #2 (*when firing more than 1 battery*)

See Figure 1: Compass face, with center at target.

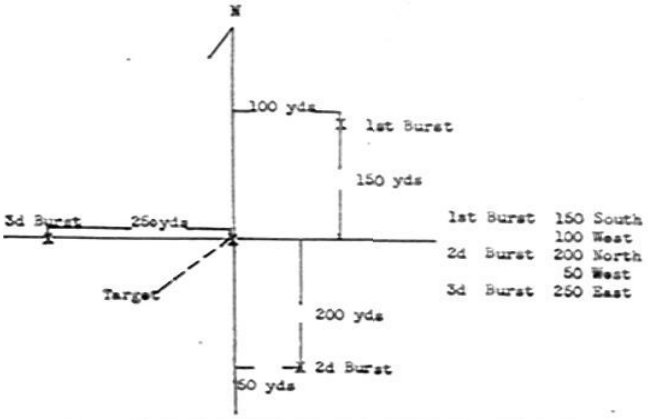

Figure 1. British FOO Method (*RAF Arty/R #2*)

Bursts moved to target in one of eight compass directions. Moves are expressed in yards. Only the four cardinal directions may be used when terrain appreciation is difficult. When only four compass points are used, corrections are given in two components: N-S and E-W.

Advantage: Easy to apply on the ground.

Disadvantage: Sometimes using eight compass points and sometimes four is an extra complication. It is not often easy to visualize as many as eight points, nor is it necessary.

[1]It is understood that our navy observers use the command "Raise (lower) burst" for the adjustment of time fire, to prevent confusion in shifting the tube.—Ed.

Using N-S Line and Sensings
Italian Air Observation Method

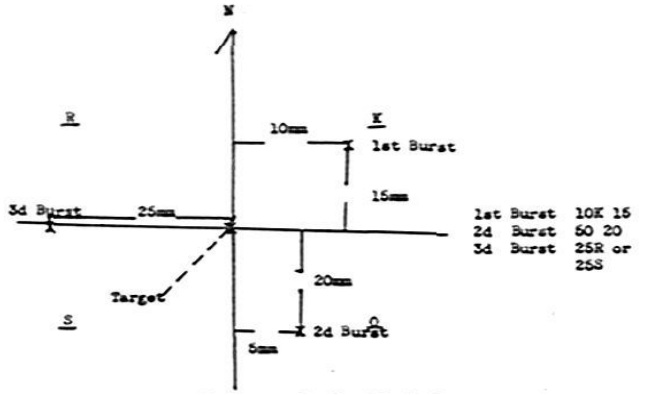

Figure 2. Italian Method

Corrects with respect to N-S, E-W axes, intersecting at target.

Quadrants are lettered and chart corrections are given in millimeters.

A desired move along the abscissa precedes the quadrant symbol and a desired move along the ordinate follows the quadrant symbol. The letter Y announces a correct adjustment.

Disadvantages: Corrections expressed in millimeters involve use of a map, which at best distracts the observer's attention from the target and at worst may cause error.[2]

British Naval Method

See Figure 3.

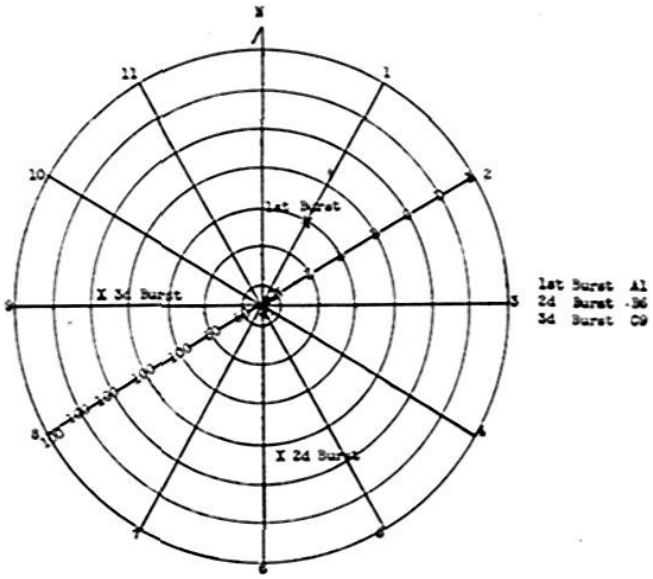

Figure 3. British Naval Method

Direction clock code, with noon at north.

Range by code of concentric 100-yard circles.

Disadvantage: An excessively complicated picture for an observer to build up, especially from the air. This was once the system used by the Royal Artillery, but it was discarded in favor of the present Arty/R method discussed above.

French Air Observation Method

North, South, in hectometers (1 hm = 100 m).

East, West, in hectometers.

Advantage: The simplest method there is.

Disadvantages: 1. As carried out in the French Army, the system is time consuming. Fire of the entire battalion is normally adjusted simultaneously, but provision is also made for opening with 3 pieces, 1 from each battery. Separate corrections are sent down for each battery.

2. This method has not been generally practiced on the ground, as the French feel that unless the terrestrial observer is within 7-800 meters of his target, his depth perception will be bad.

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[2]This method differs from the system described by Capt. Voris Connor on p. 174 of this JOURNAL for March-April, 1939. To quote him.

"Rounds are sensed with reference to two perpendicular axes, the directions of which are North-South and East-West and the intersection of which is on the target. The four quadrants formed by these axes are designated as follows: NE—K; SE—O; SW—S; and NW—R. A burst occurring 300 meters east and 200 north of the target is reported "300 K 200," or in the sequence, abscissa, quadrant, ordinate. This method has the advantage of not requiring the observer to know the location of the gun-target line. Conversion of sensings into firing data corrections is done by rapid plotting methods."—Ed.

WHAT TIME IS IT?

If you should land in an ordinary infantry division with that burning question on your lips, at least 1,100 men could give you the answer—1,102 to be exact, for that is the number of individuals issued GI watches of one type or another.

They aren't bad watches either! All of them use American movements and are of American manufacture, made by such concerns as Elgin, Hamilton, and Waltham. A few timepieces have Swiss movements, but they are reserved for time-interval recorders of the artillery.

To get back to the watches, 28 have 15 or more jewels, which means that neither you nor the Army can exactly buy them for hay. The rest of the pocket and wrist watches contain 7 little sparklers. It may interest you to know that although diamonds are the hardest stones and may look best on your girl's finger (she says), they are seldom used. Instead, sapphires are usually used because of their fine texture.

In addition to the conventional watches, there is one stop watch (facetiously said to be used to time men running between fox holes) and three message center clocks. One is used in the message center, of course, the other two being located in the forward and rear command posts.

So with all the GIs that have been lucky enough to have watches issued to them (officers buy their own), plus all the rest that have Ingersoll specials or sun dials, you ought to be able to get the time on everything except when the war will end.—*The Ordnance Sergeant.*

Artillery in the Defense of Stalingrad

By "Esen" (of the Polish Artillery)

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In the first period of the present war we were inclined to think that under modern conditions defense had ceased to be an efficient form of combat. That idea arose from the fact that a certain number of campaigns were decided in a "blitzkrieg" manner as well as from a few really glaring examples, when even powerful fortifications could not resist the modern methods of attack.

The battle of Stalingrad becomes an especially interesting object of study as an example of very efficient defense under the most modern conditions—being one of very few up to the present—it was exceedingly effective, therefore proving a most profitable experience. There is no doubt that both sides took here the strongest measures and showed the maximum pertinacity and inexorability, intending to force their own will on the adversary. The fighting there deserves the keenest analysis on account of the valuable hints it gives for the future.

Unfortunately, original sources of information are not yet available; therefore one must be content for the time being with second-hand material obtained from the press. Collected reports of many Russian military writers[1] only give a superficial picture of the development of the action at Stalingrad but they render possible the establishment of the main principles on which the Soviet defense was based.

Events proved that the German attack against Stalingrad was mounted as a rapid operation in which tanks were to play the principal part, with the air force as the main source of fire-support, infantry and artillery being only auxiliary elements, hence the general defense of Stalingrad first of all became an antitank defense.

The Germans ascertained very quickly the strength and efficiency of the Soviet antitank defense, so that all their efforts had to be concentrated on discovering and neutralizing the sources of defense which obstructed the tanks.

The technique of the German attack at Stalingrad followed a certain scheme:

Reconnaissance. To discover the location of antitank weapons the Germans used light tanks for feint attacks designed to draw the defense.

Fire preparation was not always applied. If it was, it was left to the air force to bombard artillery positions and shoot up forward strong points of the enemy's defense.

Main attack, which was usually made on a very short front, was launched either just after the fire preparation or during it in order to make use of the maximum effects of the air action. The attack was made by medium and heavy tanks, independently or assisted by infantry. Under especially difficult conditions the main tank attacks were preceded by infantry attacks which were actions of a preparatory character to at least liquidate antitank weapons on the forward edge of the enemy position and by this to open the way for the tanks.

The Soviet defense was fitted to the expected and actual enemy action, therefore above all an antitank defense. Hence throughout the organization and conduct of the defense can be found two characteristics:

(i) Active fighting against enemy armored weapons.

(ii) Security of antitank weapons.

According to all confirmed Soviet reports, artillery played a fundamental part in the defense of Stalingrad—artillery being indeed the backbone of the defense.

Experience showed that antitank defense, to be efficient for a long period, must possess *depth* and *planned organization of fire*.

The depth of the zone in which the Soviet units organized active fighting with ground weapons against the enemy's armor, was about 20 km. That depth was obtained not only by the distribution of weapons throughout the position, but also by applying strong concentrations of fire as far as possible ahead of their position.

Usually the whole Soviet defense position contained four successive waves of fire-weapons. The forward wave consisted of closed strong points made ready for self-dependent, isolated defense. Defense of these strong points was based on weapons sited for direct shooting only. There were antitank guns, antitank rifles, and detached field guns.

The three following successive waves were made by the fire positions of artillery located to a depth of about 8 km. from the forward edge of the position. This artillery normally took part in the fighting only by indirect fire, but whenever the enemy broke through the forward wave their positions became the new strong points, which rendered it possible to halt the enemy by direct fire while reconstructing the defense.

In the defense of Stalingrad was used a special type of artillery, called "tank-destroyers," sited in specially important and weak spots. Troops of "tank-destroyers" contained the usual field artillery guns, but without any means of command to enable them to fire indirectly.

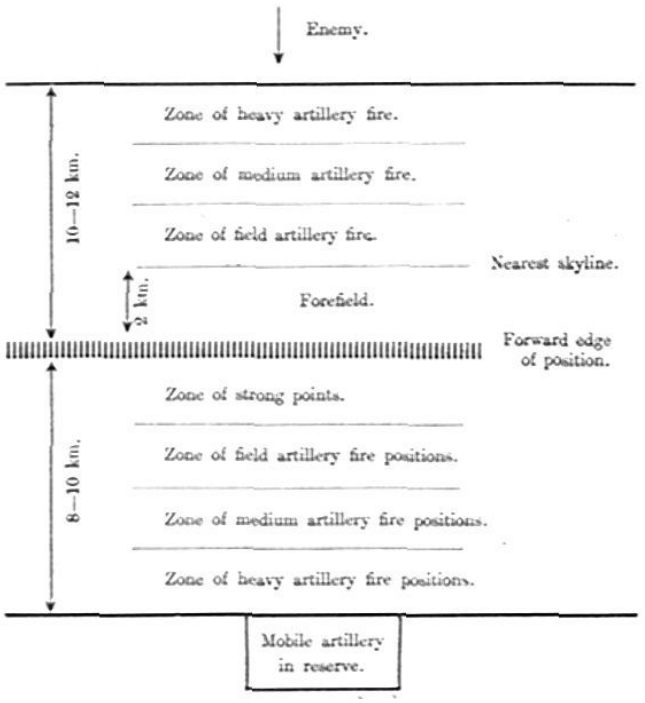
One of the most important parts of the Soviet defense were mobile units of artillery kept in reserve as antitank weapons.

The sketch on the following page shows approximately the general scheme of organization of the Soviet antitank defense applied at Stalingrad.

The fire plan ahead of the defense position up to the limit of the range of weapons was based on a certain number of powerful and very carefully worked out concentrations. This operation was designed to delay enemy armored forces, to inflict losses, and eventually to make an organized assault impossible. Experience taught that weapons sited to fire directly had to abstain from opening fire until a critical situation really demanded fire. Therefore one could see in the Soviet defense a very clear tendency to use indirect fire on a scale as large as possible.

For the fire plan ahead of the position there was established a principle that the separate kinds of artillery had to open fire beginning with the rearmost. First of all heavy artillery engaged the enemy, then being successively joined by medium and field artillery, and lastly by direct fire weapons. The

[1] L. Visokoostrovsky—*Red Star*, of 16th September, 1942.
Col. S. Galyenko—*Red Star*, of 19th September, 1942.
Maj. V. Smirnoff—*Red Star*, of 26th September, 1942.
Maj. A. Petroff—THE FIELD ARTILLERY JOURNAL, December, 1942.



strength of fire in the defense, as can be observed, increased as the enemy drew nearer to the position, reaching its climax in the struggle for the forward edge of the defense position.

Experience proved that one could never reckon on the front of the defense position remaining intact. Therefore weapons kept in reserve became a very important source for use in the most threatened place.

The encroachment of enemy tanks was always a very critical moment for the defenders, therefore the intention of the Soviet command was, above all, to render it impossible for the enemy to begin a mobile operation. In this case, when German tanks broke into the position, the defenders did not generally counterattack, but usually brought their reserve of antitank resources into the gap with the task of detaining the adversary on the spot, thus reproducing the normal position in this new place. Counterattacks by tanks were made only in the last resort. If they did take place, the reserve of mobile artillery always provided fire support for tanks directed to counterattack, so proving that the efficiency of the artillery reserve depended upon quality rather than quantity. The reserve could be a relatively small one, but it had to possess high fighting qualities and perfect technical equipment; also, it had to be extremely mobile.

During the battle the Soviet command was compelled many times to regroup its artillery to meet the changing situations. The experience gained in battle showed that all units of artillery, even those already committed to action, could be regarded as a reserve of antitank weapons provided they possessed the required tactical and technical efficiency.

Because the efficiency of direct fire was conspicuously higher than that of indirect fire, field artillery units located in the immediate rear of the strong points were used as a local reserve of antitank resources to replace direct fire weapons already lost.

In organizing their defense the Soviet command took particular heed of the centralization of artillery as well as of the careful preparation of fire plans, in order to secure the greatest possible flexibility in applying fire and controlling it. In this way only were they able to compete with the advantage enjoyed by the enemy who, having the initiative, were able to choose the place for attack. The Soviet command adopted this solution in spite of their realization of the superior worth of direct fire. Inferiority of fire was counterbalanced by the quantity of ammunition expended.

The organization of artillery on the principle of centralization gave very valuable advantages in the possibility of massing concentrated fire in any place according to the needs of the battlefield.

Another good feature of this system was the fact that weapons taking part in fire concentrations (being widely dispersed) were more secure against possible destruction, especially from the air. Moreover, the artillery being used for indirect action was never wholly held by the fighting and so could disengage at need and be transferred to the most menaced spot of the moment.

A further strengthening of the Soviet antitank defense came from antiaircraft weapons which were always prepared for self-defense against any threat from the ground.

In general, the Soviet experiences gathered in the battle of Stalingrad allow formulation of the assertion that "*the efficacy of modern antitank defense is a function of skill in maneuvering artillery and applying artillery fire*."

This record of means which were put into practice in the defense of Stalingrad indicates the main plan applied by the Soviet command. All this was used to construct a system suitable for active fighting against enemy armor. Additional measures were adopted for the security of antitank weapons.

The Soviet command estimated that the main peril threatened from enemy tanks, therefore in their organization could be seen some means tending to impede the enemy's use of tanks, or at least to render impossible any surprise.

As the enemy took particular interest in weapons located in the forward part of the defense position sited for direct fire, this kind of artillery was really the most dangerously involved. To preserve these important weapons the Soviet command prohibited the engagement of enemy light tanks if they appeared in the forefield obviously to draw the fire of the defense. Antitank rifles and artillery in concealed positions had to fight against tanks in this period of the battle. Also, artillery located inside the defense position had to organize a special network of observation to protect its gun positions from surprise by enemy tanks if they should penetrate. The Soviet sources of information underline the far-reaching significance which the self-guard of artillery had during the battle of Stalingrad.

In spite of the fact that the Soviet defense was based principally on an antitank system, it had to be additionally reinforced by infantry and machine guns in order to protect antitank weapons from attack or infiltration by enemy infantry. Practice proved that every antitank measure, including artillery in fire-positions inside the defense, had to be shielded by infantry equipped with machine guns. Tommy-guns proved to be most useful here. In consequence, a system of infantry defense had to be superimposed on the basic system, i.e., the antitank defense.

Experience showed that the air force was relied on by the Germans as the principal means of fire-support. Here, therefore, was the reason for the particular consideration which the Soviet command gave to the question of antiaircraft defense. The main feature of antiaircraft defense on the Soviet side was a passive defense. Careful camouflage, concealing and intrenching weapons, gave in practice quite satisfactory results.

Soviet authors have come to the conclusion that basing fire-support on the air force was a cardinal error on the part of the German command in the above action. "Some people have an exaggerated notion regarding the destroying effect of air action. It can be threatening only if it can take by surprise. Nevertheless, when we are properly prepared to meet the air enemy, he would not be able to succeed and artillery would retain its readiness for battle." Soviet sources cite many instances to confirm this thesis.

The German and Soviet commands appear to have held different views upon the question of the use and support of tanks. The Soviet principle is that "tanks should not engage enemy artillery without the assured support of their own artillery or air force. Efficient action against weapons may be assured only by the fire of their own batteries. By this it is not meant that the air force should not be used for these tasks. On the contrary, one must always try to reinforce artillery fire with air bombardment."

From their estimate of the value of the various means of fire support in modern conditions the Soviet prepared carefully for an artillery duel with the adversary in order to secure themselves against the destroying enemy action, which, in the Soviet opinion, was the real danger for the defenders.

Soviet reports regarding experiences gained from the successful defense of Stalingrad allow the formulation of the following general conclusions:

1. Artillery, not air force, is the principal source of fire support in fighting between two more or less equally matched modern adversaries.

2. No system of defense may be called modern which is not primarily designed to resist armor.

3. Defenders should ever seek to stabilize the fight when attacked by an armored adversary; first of all, to destroy panzer adversaries by fire must be the aim of the defense; following that may come a suitable moment for using tanks; counterattacks by tanks against tanks should be carried out only as a last resource.

4. The essence of modern defense is antitank defense based on organized and powerful artillery fire; machine guns most often play only an auxiliary part as a security for antitank weapons against eventual threat from enemy infantry.

5. Fire powerfully maintained is the real basis of antitank defense—that is, *artillery*.

6. Efficacy of antitank defense depends on its depth and on the scale of preparation.

7. Depth of area of active fire fight against enemy armored forces can be obtained not only through deep location of weapons, but also through applying organized fire ahead of the defense position.

8. Indirect artillery fire, to be efficient, must be massed.

9. Control of artillery used in defense must be flexible; therefore it must be based on the principles of the maximum centralization.

10. Possession of a reserve of fire weapons is very important for the defense.

11. If in critical moments the defenders are unable to oppose enemy tanks by an organized concentration of artillery fire, then bringing their own artillery weapons into the first line, with the task of halting the enemy by direct fire, may often be the only right and effective solution.

12. Skill in applying artillery fire and in maneuvering guns is a gauge of the vitality and durability of modern defense.

IF I HAD ONLY KNOWN!

By Capt. Robert F. Cocklin, FA

"All right, men, start dropping your duffle bags into the barge." With these words, my battery started to load for a short trip from an army transport toward a very green and pretty island down here in the South Pacific. Quite naturally, we were all keyed up and anxious to see what was in store for us. Had we only known before we left the States we could have been much better prepared. Since most of the country in the South Pacific Area is quite similar, perhaps some of our experiences will be of benefit to those who are preparing to come to this side of the world.

First let's look at an officer's personal equipment. My advice would be, don't load yourself down with a lot of clothes and other necessities. Cigarettes, knives, lighters, and the hundred-and-one other little things you want can be obtained without too much trouble down here. As for clothes, you will be wearing khakis or fatigues all of the time. There has been no need for a blouse or other dress clothing. You'll want one suit of wools for the first part of your trip, after which they will be put away and probably never used again. I gave mine away. You will want a good raincoat (not a trench coat) and rubber boots; bathing trunks will come in handy.

Money means very little down here as most of the trade is on the barter system. You can get practically anything you want with a couple of bottles of spirits, but cash won't do you much good.

You can use your battery and battalion funds to a much better advantage before you leave than after you get here. Get your outfit a light plant and plenty of sockets and bulbs, as this will add a great deal to your comfort. If at all practicable, purchase an ice machine or some sort of a refrigeration plant; it will be worth its weight in gold.

Swimming in the ocean is great fun only if you can shower in fresh water when you get out. There are no shower heads available in these parts.

Some good short-wave radios are one thing we fortunately thought to bring. Most of them work pretty well here. A few things we didn't think to bring were a keg of nails per unit, door hinges and springs, paint, and what other building supplies you think you might need in setting up your own camp. All this sort of thing is hard to get locally. Lumber won't present too big a problem as native logs will give you a good start. When you load on the ship be sure your shovels, picks, carpenters' tools, and building materials are placed so they will come off first; you won't need your other equipment until you have set up camp.

It's not at all too tough down here, but I do feel that you should be reminded that for the most part you will furnish your own recreation and entertainment. I haven't seen any officers' club yet. So govern yourselves accordingly.

FO-LnO ORGANIZATION

FOs must work strictly under the instructions of LnOs. Only in this way can the observation be coordinated thoroughly, with not more than one FO displacing at a time. Furthermore, if the LnO feels at all doubtful that the FO will be able to see anything if he accompanies the infantry, he can discuss the matter with the infantry battalion commander with a view to holding the FO back until it is likely that his going forward will be worthwhile. Remember, many young FOs who are asked to advance with the assault echelon, rather than be accused of avoiding danger will continue on forward even though their chances of observation are negligible. Our mission of helping the infantry force as a whole must be both kept in mind and accomplished.

PERIMETERS in PARAGRAPHS

(Based upon latest information available at date of writing, and subject to correction as more complete reports are received.)

By Col. Conrad H. Lanza

THE WAR IN RUSSIA (19 Mar to 20 Apr 44)

North of the Pinsk Marshes there has been some severe fighting of a local character, not involving major operations and resulting in no material change in the front line. South of the same marshes the Russian armies have everywhere been on the strategical and tactical offensive which has resulted in large and important territorial gains.

In general the Germans have fought cautiously with an apparent effort to avoid engaging more troops than absolutely necessary. Their mission has remained to yield territory rather than lives. The end of the period, however, has found the German armies in the south nearly on the last line beyond which they cannot retreat without seriously affecting their strategical situation. The Germans apparently are well aware of this. According to British reports the German GHQ reserve is largely concentrated in south Poland, in the area whose center is about 150 miles northeast of Krakow. It is reported to have a strength of 30 or more divisions.

Germany has taken over the direction of the war in Hungary. This appears to have been an inside affair furthered, and approved of, by the Regent who remains nominally at the head of the state. The Army backed it. While some of the Hungarian diplomatic officials to neutral countries resigned to express their disapproval of the new Hungarian government, none of the military attaches did so. They continued to support their comrades in the army, and with minor exceptions the army served loyally under the German command.

The necessity for a unified command on the eastern front is apparent to Germany's allies. As long as they continue in the war they are not likely to object to this. Romania needed no taking over and continues to support Germany.

The Germans have a Polish division in line identified by the Russians. It appears to be at least an average division. Only one has been noted so far.

Estonian and Latvian troops are appearing in line opposite their own borders. British reports indicate that about 10 divisions may be raised in these states. The equivalent of about two have been identified in line. At least one, and probably two, divisions of west Europeans is in line. On the other hand the Spanish Division has apparently been mustered out.

Indications are that the Germans are raising more troops. The new organizations are replacing German divisions, transferred to the GHQ reserve.

Finland, after having been given a second chance, on 19 April definitely refused to accept the armistice conditions offered by Russia; these included demobilization, to be half completed by 31 May and finally by 30 June.

Military operations during the period considered will be discussed under North Sector and South Sector, the Pinsk Marshes being the boundary between them.

NORTH SECTOR

At the beginning of the period the line was

Naroova River (with Russian bridgehead on west side southwest of Narva)—Lake Peipus—Velikaya River (with German bridgeheads at Pakov, Ostrov, and Opochka)—Idritsa (German)—Chernaya Lusha (G)—Vitebsk (G)—Krasnoe (Russian)—Gorki (?)—Chausy (G)—Dovsk (R)—Rogachev (R)—Zhlobin (G)—Kalinkovichi (R)—Pripyat (or Pripet) River—Horyn River.

Naroova Campaign

Fighting surged around the Russian bridgehead. This had been taken in February, in the Russian forward rush following the lifting of the siege of Leningrad. The Germans had intended to hold the Naroova River; the bridgehead bothered them as a weak point in their defense. On the other hand the Russians wished to expand it and break down the entire river line.

On 19 March a Russian attack failed to get forward. It was repeated in greater strength on the 22nd, without material gains. These small gains were lost to a German counterattack delivered with considerable armor on 26 March. This German attack was preceded by a powerful artillery preparation and the plentiful use of smoke. The idea was to recover lost ground with minimum losses to own troops. The Germans went beyond their former positions and into the previous Russian line. Circling, the Panzer troops surrounded a sector.

On 28 March, Russian attacks were launched to relieve the troops encircled two days earlier. This failed, as did a renewal of the attack on the next day. On 30 March the Germans had almost reduced the encircled Russians, but the last were not subdued until 8 April. The encircled Russians belonged to two, possibly three, divisions, some of which escaped.

An attack by the Russians on 7 April made a dent in the German line. This was reduced by 9 April. Ten days later a new major German attack was launched which sliced off another segment. The terrain where this fighting occurred is boggy, and a difficult one to maneuver over. The final result of a month's assaults has been to narrow the Russian bridgehead without removing it.

This is one of the few places where the Germans have been consistently on the tactical offensive. The inference is that the Naroova River was intended to be the line beyond which they would not voluntarily retire. The Russians by quick action having acquired the bridgehead, steps were then taken to recapture it. This has been slow, due to the cautious manner of the German attacks, which have been of a limited nature, employing maximum amounts of artillery and armor to conserve personnel.

Pskov and Ostrov Campaign

Pskov and Ostrov are about 32 miles apart on the east side of the Velikaya River. They have populations of some 60,000 and 10,000, respectively. Relatively unimportant in themselves, they have been organized into strong centers of resistance defending the east borders of Estonia and Latvia. Latvian troops of unascertained strength are in line at Ostrov.

Very strong and continuous efforts have been made by the Russians to advance into the Baltic states.

From 26 to 30 March, both inclusive, attacks were delivered against Ostrov. Then for five days—31 Mar to 4 Apr—attacks were against Pskov. Main Russian efforts against both places were on the south sides. On 5 and 8 April both places were attacked at the same time. None of these attacks succeeded. According to German accounts the Russians lost 306 armored vehicles during these battles.

The Russians then relieved the divisions in line with fresh ones. On 9 and 11 April Ostrov was attacked again. Strong air forces were employed and some advance was accomplished, reported as subsequently lost to German counterattacks. On 13, 14, and 15 April new attacks were made against Pskov, always toward the south sector.

These were repelled with rather heavy losses. Minor attacks against both places on 16 April ended the fighting of the period.

It is possible that the Russian mission in this campaign was to hold Axis troops from being sent south where an important offensive was under way. In this case it was relatively unimportant whether terrain was gained or not.

Vitebsk

This German strongpoint has been under more or less constant attack since October, 1943. Being an important road and railroad junction, it is strongly fortified on all sides.

The Russians continued to attack, with main efforts southeast of the town. A light attack on 19 March was followed by a series of daily attacks from 21 to 25 March. Each day the Russians' advance was led by tanks in waves, followed by infantry and supported by strong artillery fire. Penetrations were made in the German defenses on 21, 24, and 25 March. On the 28th a very powerful attack was launched by strong forces of armor with special air and artillery support. This was met by a somewhat similar German force of Panzer troops, infantry in armored cars, artillery, and air forces. In a severe battle neither side gained. Thereafter the front temporarily became stabilized.

Mogilev

Mogilev is another German strongpoint at the head of navigation on the Dnepr River.

On 27 March the Russians started a major offensive in which they utilized 17 infantry divisions and 2 armored divisions. The first day's attack, made with strong air support, failed to get forward. It was renewed on the following day, and again on the 30th with a particularly violent artillery preparation. The German artillery was strong too, and was not neutralized. It laid down a defensive barrage in front of the lines. Many of the Russian tanks were crushed by this fire.

On the 30th of March, new divisions having been inserted in line, the Russian attack was resumed without much success. On the 31st the Russians broke through the German line but were unable to hold the gain against a German counterattack. A final attack on 2 April was not a success.

From the German point of view the Mogilev campaign was what they call a defensive success, in that the enemy's losses exceeded those of the defenders. In a war of attrition, and for Germany in her present strategical situation, conservation of her own forces with proportionately fewer losses than her enemies is a major mission.

Detached Sectors

For the first time in a long while, the Far Northern front has become active. On 21 March a Russian offensive by about one division was started west of Kandalaksha, and on the same day a German offensive by an Austrian Mountain Division began west of Murmansk. Both attacks made minor gains, both were discontinued by 27 March.

On 4 April a Russian counterattack recovered a part of the lost terrain near Kandalaksha. A new German attack on 9 April advanced their line slightly.

The net result of this fighting has been the establishment of the front along the Liza (Litza on some maps) River, which empties into the Arctic Ocean.

Reports from Norwegian sources are that the German road net is now open all the way from railheads in Norway, across Lapland, to the area between Kandalaksha and Murmansk. Depots, dumps, and barracks are ready in Finmarken, the northernmost province of Norway, obviously in preparation for a withdrawal of German troops from north Russia. Informants added that there were no indications that a German withdrawal was imminent. The Germans have available an alternate line of retreat from the Kandalaksha area to the head of the Gulf of Bothnia.

At the end of the period there had been no substantial change in front line in the north sector.

SOUTH SECTOR

South Russia has witnessed a major and extensive Russian offensive during the entire period considered, until just before 20 April, when operations were temporarily discontinued.

Five principal forces have been involved:

a. **From the Pripet River, southward to near Tarnopol, on a front of 150 miles a strong Russian army was to advance westward into south Poland.**
b. **From the vicinity of Tarnopol to Vinnitsa, also about 150 miles, another strong army was to advance southwest to the Carpathian passes into Transylvania.**

These two movements were almost at right angles to each other on diverging lines. It was obvious that if the enemy struck between the two, along their common boundary which ran through the Tarnopol area, a critical situation might arise. To avoid this possibility and to insure close liaison between the two operations, both were placed under the 1st Ukraine Army Group (Marshal Georgi K. Zhukov).

c. **The 2nd Ukraine Army Group (Marshal Ivan S. Konev) was on the left of the 1st, and on a front of about 125 miles was to attack southwest toward the general line Iasi (Jassy on some maps)—Chisinau (Kishinev).**
d. **The 3d Ukraine Army Group (Marshal Vassilevsky), on the left of the 2nd and on a 100-mile front, was to clear the coast north of the Black Sea as far as the Danube River.**

On 19 March the front of the foregoing forces was:

Horyn River—Karassen (Russian)—Gulevichi (R)—Luck (R)—Krzemieniec (German)—Zbaraz (R)—Tarnopol (G)—Skalat (R)—Proskurov (G)—Bug River (German bridgehead at Vinnitsa)—Zhmerinka (G)—Rachny (G)—Yampol (R)—Peschana (R)—Savran (G)—Golovanesk (R)—Dobryanka (R)—Pestchany Brod (R)—Bratsk (G)—Yelanets (R)—Nova Odessa (R)—Nikolaev, with bridgehead east of the Bug River (G).

Boundaries between Army Groups were approximately

between 1st and 2nd: Tulchin—Mogilev Podolski—Iasi (all to 2nd), 2nd and 3d: Voznesensk (to 3d)—Tiraspol (to 2nd)—Chisinau (to 2nd).

The fifth Russian force was

e. **The 4th Ukraine Army Group (plus Maritime Army, attached), which was to recapture the Crimea.**

The four operations first listed had commenced between 4 and 6 March, and on the 19th were in full progress, in close contact with the enemy, and all heavily engaged.

Poland Campaign (1st Ukraine Army Group)

At the north strong Russian forces had crossed the Turja River, both north and south of Kowel, and were attacking westward. Kowel was held by a German garrison of about 2 divisions under Lt. Gen. Gille and was encircled under siege; it was an important road and railroad center, and its possession by the enemy complicated the supply problem. Thaws had set in. Roads were few, and these poor. Mud was everywhere.

At the south the Russian lines made a half-circle about Krzemieniec. This was being vigorously assaulted. On 19 March a Russian attack coming from the west forced a crossing of the Ikwa River. Small combat groups worked up steep banks and entered the town from the west. The Germans then fell back to the southwest. On the same date Russian attacks were delivered southwest from Dubno toward Brody, and strong attacks were commenced against Kowel, possession of which was necessary for a further advance in this area.

All these attacks were continued on the following days. On 20 March the Russians took Radzivilov, 9 miles northwest of Brody. Very strong opposition was met; the line advanced but slightly on the next two days. On the 23d a German counterattack broke through to the artillery line and recovered some territory.

The attack against Kowel made progress. On the 22nd Russian armor broke through and 10 tanks went on into the center of the city, a town of 28,000 people. Intercepting armor destroyed 6 of the tanks but the other 4 escaped back to their own lines.

Without interrupting the attacks against Kowel and Brody, on 23 March a new operation was started to reduce Tarnopol. The initial attack reached Zalozce. Next day the Russians forced the Seret River and reached the Lwow (Lemberg) & Tarnopol RR west of Tarnopol. Pushing southward, this force on 26 March connected with another force attacking around the east of Tarnopol, thereby encircling that place.

Tarnopol was another road and railroad center. In a country lacking good roads, with but few even poor ones, and in the season of rain and mud, these centers were of considerable importance.

At this time the Germans lacked reserves in this part of Poland. They estimated it would take two weeks before they could be ready to stop the enemy's advance. There was a choice of withdrawing the garrison from Tarnopol while there was yet time and thereby strengthening the field army, or else leaving the garrison as a road-block on the enemy's line of supply until it either could be relieved or was overcome. The same condition applied to Kowel. The decision was to risk the possible loss of these garrisons, as they could accomplish more functioning as road-blocks than in the field.

The German garrison at Tarnopol consisted of parts of 4 divisions, under Maj. Gen. von Neindorf. According to Russian accounts the total strength present was about 16,000. It adopted a hedgehog defense, blocking all lines of communication. The Russians, realizing the importance of opening routes through this place, immediately started a vigorous siege.

The first German counteroffensive appeared on 24 March. It was northwest of Kowel and had for its first objective the relief of that besieged place. No progress was made until the 27th, when a small advance was accomplished. The Germans were following the cautious policy of risking little. Strong artillery and air preparations covered the advance of armored troops. The latter then advanced a short distance. If all appeared well, infantry in armored trucks went forward to consolidate the ground gained. If things did not look well, time was taken for further air and artillery preparations before a new advance was risked. As there were in the area a great many villages which often ran into one another, advances went from village to village or from one wood to another.

By 27 March the Germans had arrived north of Kowel, but beyond the besieging force. This compelled the Russians to maintain two lines about Kowel: one to keep the garrison in, the other to keep the relieving force out. The Russian advance in this sector was stopped. The German offensive did not immediately turn toward Kowel—it continued slowly eastward and by 29 March reached the Turja River.

Russians had broken into Tarnopol in the first quick rush on 27 March. The garrison managed to drive these out, after considerable street fighting. Armored troops were brought up but failed to get in. In the succeeding days Tarnopol was shelled heavily and intensively bombed. Attacks were delivered by day and night.

The advance toward Brody was resumed, but met such strong resistance that gains could not be made directly toward that town. The attack was extended to the north. This had better success, and on 3 April reached the line Gorokhov—Berestetchko—Radsivilov (all inclusive). German resistance then stiffened. A further attempt to advance failed.

In the meantime, on 2 April the investing force about Tarnopol broke into the city from the north, east, and south. Once again violent street fighting developed. Many of the structures were of brick and the battle went back and forth through walls and cellars. Conscious of the need for resisting as long as possible, the German commander was very energetic and fought back vigorously.

Having reached a good line of defense, the Kowel relieving force held the Turja River with its left and with its right turned south on 2 April toward Kowel. Attacking deliberately and cautiously, this operation made steady progress from one low ridge to the next and across some rather extensive marshes. On 5 April it broke the besieging lines and relieved the Kowel garrison.

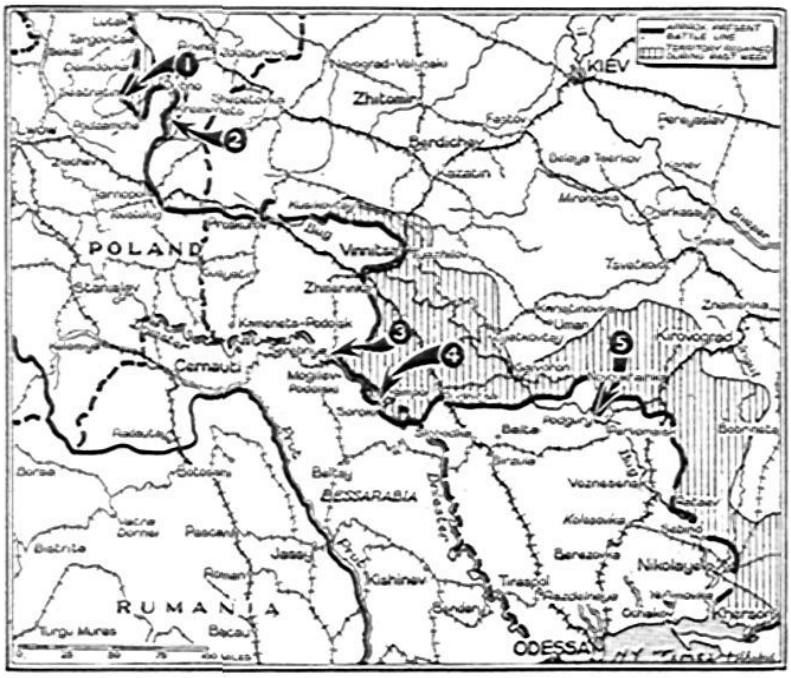
Fighting continued around the Brody area. The Russians extended the front toward the south and attacked astride the Dubno—Brody road. None of these attacks gained. On 6 April a German counterattack broke the Russian advance. It was not pushed, however, the Germans contenting themselves with making minor changes in the front.

The Germans having relieved Kowel discontinued their offensive, in accordance with their present policy to not engage in major offensive operations pending results from the expected invasion of west Europe. The Russians thereupon renewed their attacks against Kowel.

Tarnopol at this time was in a bad situation. The Russians occupied a considerable part of the town, but not enough to unblock lines of communication. The garrison was being supplied by air with food and ammunition. The Russians had cut off the water supply, and lack of water was a major factor in the situation. Gen. von Neindorf radioed that this condition would preclude his holding out much longer.

In view of this situation the German High Command ordered a relief expedition. Present indications are that this was ordered earlier than the Germans were really ready to undertake such an operation, consequently it was none too strong. It started off on 13 April, west from Tarnopol, and made progress the first day. At the same time von Neindorf was ordered to aid by breaking out westwardly with a view to meeting the relief expedition. As a preparation for this move, the Tarnopol garrison (or what was left of it) was assembled on 14 April on the west edge of Tarnopol. Thereupon on 15 April the Russians entered that part of Tarnopol which had been defended and report taking 2,400 men who surrendered. The German relief expedition had made further progress on 14 and 15 April.

On the 16th the relief expedition made contact with what remained of the Tarnopol garrison. On 17 April this operation ended when the last of the German garrison remaining joined. It is not yet known how large this detachment was. The resistance of Tarnopol blocked lines of communication to the Russians for just three weeks.



As the period opened, toward Lwow the Red Army moved forward to Sestratin (*1*); *to the east it took Kremenets* (*2*). *Troops of the 2nd Ukraine reached the Dniester along a 62-mile front and captured Serebriya* (*3*) *after a 20-mile advance. In the same region the river was crossed on a 31-mile front and 40 places were seized, including Soroki* (*4*). *East of this area the important junction of Pervomaisk was flanked by a column that gained 16 miles to occupy Podgury* (*5*), *on the Bug River*.

Russian attacks late in the period against Kowel, and southwest from Luck and Dubno, failed to gain ground. At the end of the period the line was

Pripet River—Turja River (with German bridgehead at Kowel)—Kisselin (?)—Gorokhov (R)——Berestetchko (R)—Radisivilov (R)—Zalozce (R)—Strypa River.

Bucovina Campaign (1st Ukraine Army Group)

As the period opened on 19 March, Russian operations centered around Proskurov, Vinnitsa, Zhmerinka, and Mogilev Podolski. These were road and railroad centers in a generally roadless country, and were held by the Germans. In the salient or loop from Proskurov through Vinnitsa to Zhmerinka was a mobile German group of some 15 motorized or armored divisions, under Gen. Hans Hube,* whose mission was to delay the Russian advance. He was prepared to move in any direction.

On 19 March Hube's group broke the Russian attack against Proskurov; but while so engaged the Russians gained at Vinnitsa and the Germans abandoned that city. Russians also gained around Zhmerinka and reached the outskirts of Mogilev Podolski.

On the 20th Hube's command continued their offensive and were joined by German divisions west from Proskurov. Several slight gains were made. In the meantime the Russians from Vinnitsa advanced to Litin, threatening Hube's rear. The direction of this Russian advance was nearly southwest, in accordance with the army mission to seize the Carpathian passes. On this day strong Russian attacks against Zhmerinka failed.

On 21 March the 1st Ukraine Army Group launched its main effort on the front from Tarnopol

*Same general who had commanded in Sicily.

to Proskurov (both exclusive) on a front of 45 miles and headed almost due south. This attack, following the usual artillery preparation, was led by armor. It made substantial progress, brushing aside Hube (who was somewhat toward the Russian left flank) and forcing back a weak German line directly in front.

Due to Hube's force this Russian attack made lesser progress on its left, where it was forced to refuse its flank against the large mobile German group in this direction. The Russian right went ahead faster. Instructions were sent to the Russian column which had started from Vinnitsa to expedite its movement, attack Hube in rear, and if possible encircle him. Hube detached a rear guard to delay the Vinnitsa force while he hung on to the main Russian force. The Germans evacuated Zhmerinka.

By 23 March the Russian right had reached the line Trembowla—Kopyczynce, at which latter point its left continued to be refused. The Russians from Vinnitsa arrived in the area around Yeltushkovo, 40 to 50 miles from the Russian main force. Hube was in between. He was vigorously attacked by the Russian main force, but managed to extricate himself from serious difficulty. German troops were at Bar, which cut the line of supply to the Russians at Yeltushkovo. Bar had been by-passed by the Russian advance in an effort to expedite the movement against Hube, as ordered. The Germans still held Proskurov which, with the possession of Tarnopol, interfered with supplies for the main Russian effort.

Notwithstanding the difficulty of supply by the usual routes, by improvising cross-country routes the Russians continued on. On 24 March the right reached the line Czortkow—Husiatyn, while a mobile detachment advancing rapidly arrived at Zaleszczyki on the Dnestr River. This was an advance of 50 miles in one day. Vigorous attacks were made against Tarnopol (as already described) and against Proskurov, with a view of quickly establishing a good line of supply.

Hube now ordered the garrison at Proskurov, which was threatened with being encircled, to abandon post, proceed south, and join him in the general vicinity of Tinna, about 32 miles away. The garrison at Bar, not being immediately threatened, was directed to hold on.

On 25 March Hube's command was between Skala and Tinna, and was joined by the former Proskurov garrison. Proskurov was occupied by the Russians, thereby removing for them an important road block. The main Russian force exploited its previous success and without much fighting reached the line Zaleszczyki—Skala (exc)—Husiatyn—Grudek—Satanov. Orders were issued for the next day to advance on Kamenets Podolsk, and the force from Vinnitsa was ordered to the same place. Apparently it was assumed that this would practically encircle the large force of Hube and ensure his ultimate destruction.

On 26 March Russians arrived at Kamenets Podolsk from all directions. They found only a small German force there, which was surrounded. No report has been found as to the fate of this garrison and it is assumed it was captured or destroyed. Hube marched around to the north of the Russians moving southeast toward Kamenets Podolsk, but failed to break the Russians near Skala. He realized that the Russians were closing in on him and that he had to act fast. The sector he selected for attack in order to advance west was too far to the south to enable him to break out toward the west. During the night he moved north.

The terrain in this area is generally flat and open. It is intersected by shallow valleys which run nearly north and south. These ravines are wooded, and contain the few main roads in the territory. Most of the villages are in these valleys. There are many orchards. Hube took advantage of the terrain to conceal his troops as far as possible in the valleys, where there was cover from air observation. He changed position at night. He was supplied in part by air, but there was considerable food in the country. As his force was large it could not be attacked with impunity. The Russians used caution in approaching him. Usually before a major attack could be launched against his 15 or more divisions, Hube slipped away during the night. He now made his main mission that of being a movable road-block in enemy rear areas, charged with interrupting enemy communications to his best ability.

On 27 March the Russians attacked Hube from the northeast on the line Yarmolintsi—Sinkovsy and drove him southeast. After detaching other forces to watch Hube, the main Russian force crossed the Dnestr on a front of 50 miles from opposite Tlumacz to opposite Cernauti. The immediate objective was to seize the line Stanislawow—Cernauti. Hungarian troops on covering duty were driven in, but there was no serious opposition.

At this time the German High Command had concentrated what reserves it had available against the Russian offensive westward into Poland north from Tarnopol, as already discussed. It was avoiding combat elsewhere pending arrival of reinforcements and was depending largely on its detached forces, charged with delaying the enemy by blocking his communications. As they arrived new troops were being assembled to protect the Carpathian passes.

On the 28th the advance across the Dnestr continued against minor opposition. Now 'way to the north the attack against Hube was pushed southward through Yarmolintsi. Hube fought back viciously, and the Russians made only a small advance. The advance south of the Dnestr continued to meet only light opposition.

On the 29th the Russian advance met strong opposition at Stanislawow. Except for this it continued to push southward and reached the linue Stanislawow (exc.)—Prut River from Kolomyja (inc.) to Cernauti (exc.). At Cernauti the Russians captured the bridge over the Prut before it could be demolished.

Hube on this day moved south. The Bar garrison seems to have joined him. He left a delaying force south of Yarmolintsi and during the night 28/29 March moved south to the area around Staro Ushitsa. He there attempted to cross the Dnestr but met opposition from troops of the 2nd Ukraine Army Group on the south side. Unable to make it, he decided to move west again during the ensuing night with part of his force, while continuing his efforts to cross the Dnestr.

On 30 March Hube, back again in the Skala area, met strong opposition and his march to the west was stopped. Near Stanislawow the Germans attacked. They found only a motorized brigade in front of them and drove this away. Russian forces pushed out; meeting no special opposition they occupied Cernauti, with the advance guard reaching Starojinet on the Seret River. On the right flank other advance troops reached Delatyn, at the door of the Carpathian passes, on 31 March. As the month ended the line in this sector was

Stanislawow (G)—Delatyn (R)—Kolomyja (R)—Starojinet (R)—Cernauti (R)—Hotin (G).

On 1 April, the Russians north of the Dnestr advanced west to include Podhajce. Hube also moved west and made progress in the Skala area. On this date a Hungarian army completed organization in rear of the Carpathians. Its leading elements appeared in the vicinity of Stanislawow and gained some ground.

On the 2nd Hube's troops which had been left behind to cross the

Dnestr if possible southeast of Kamenets Podolsk abandoned the attempt after suffering considerable losses. Those left moved west to join Hube's main force. At Stanislawow German and Hungarian troops continued to attack cautiously, while on the opposite flank Germans at Hotin repulsed Russian attempts to take that place. Between these extreme flank positions Russian forces advanced into the Carpathian passes. Meeting strong resistance, the advance was slow.

Hube continued to attack westward on 3 April. The Russian communique for this date indicates that the Russian Command had been misled by the attempt to cross the Dnestr River east of Kamenets Podolsk. They were under the impression that they had stopped Hube's main body and now had him cooped up. They expected to destroy him within a few days. Hube received assistance from the German air force which scouted for him, aided in attacks on the enemy, and transported some supplies. South of the Dnestr the main fighting was south of Cernauti, where the forces that the Russians had available that far forward were unable to proceed.

On 4 April the Germans renewed their attacks eastward from Stanislawow. Like other German attacks of this period they were cautious, made with a mission of inflicting proportionately greater personnel losses than were received. The advance made was minor.

A German relief expedition had been assembled north of the Dnestr River west of the Zlota Lipa River. Its mission was to make contact with Hube, who was instructed to continue to advance westward and join the relief force. In compliance with this order he attacked at daylight, ramming a way westward and succeeding in making some advance. The German garrison at Hotin also attacked westward, cutting some Russian supply lines. The mission of this force, however, seems to have been primarily to save itself. Except for the rear guard, this seems to have been accomplished. The rear guard left in Hotin held out until the next day, when it was over whelmed.

On 5 April both Hube and the Hotin garrison were attacked. Both warded off the attacks and continued on their way west. Hube had attacked at daylight in a northwesterly direction, penetrating the Russian lines at one point. A Russian counterattack kept his advance down to a short distance, but the German forces (supported by strong air forces) made gains.

During the night 5/6 Hube continued his attacks and forced a crossing westward over the Sereth River. He blew up all trucks and tanks unable to make this crossing. The relief expedition going eastward similarly forced the Koropiec River against strong opposition.

On the 6th the Russians (following in Hube's rear) occupied Skala. Hube continued his westward attack all day. The Hotin garrison passed the danger point and rejoined its main forces southeast of Cernauti. The Russian advance forces were yet in the Carpathian passes, meeting stiff resistance but making some progress. A rather strong Russian attack made toward Stanislawow with a view of clearing up the situation on the right flank developed very strong resistance and was unable to advance.

On 7 April the German relief expedition north of the Dnestr made substantial progress. This was now close enough to Hube to enable joint operations against the Russians in between to be coordinated. Russian dispatches of this date recognized this situation. It was explained that when dealing with such a large force as a complete motorized army it was impracticable to cover all possible exits from an area. Russians attacked Hube from the rear through the Skala area. Since Hube was moving in this direction anyway, his rear guard fought off the Russians from successive positions long enough to enable the main body to move on to the west.

The Russians in front of Hube were more concerned with the relief expedition. They were fighting a rear guard action against Hube's advance while counterattacking the enemy coming from the west. They had insufficient forces to do both. The Russians seem to have had too many troops in rear of Hube and too few in front. This appears to have been caused by the erroneous estimate of the situation of the 3d, which assumed that Hube's main force was east of Kamenets Podolsk trying to go south. Whether Hube had intended to give this impression or whether this just happened is not yet known. The result was that Hube was able to get away.

Still fighting night and day, the relief expedition going east and Hube going west made contact on 8 April. The last of Hube's troops did not enter the lines of the relief expedition until the 10th.

According to Russian accounts Hube at the date of his relief had 22 divisions, including 6 Panzer, 9 motorized, and 7 infantry divisions. This was an increase of Hube's original strength, stated at the commencement of his campaign as then being only 15 divisions. He accumulated additional divisions during the campaign from Proskurov and possibly others from Bar.

Russian accounts claim that not over 10,000 men and 80 tanks remained to Hube at date of relief. This fails to check with the German losses reported in the Russian communiques of 3 and 10 April. Together these claim the Germans lost 28,000 killed and 12,000 prisoners, which with the men admitted to have escaped accounts for only 50,000 men. This seems to be much too small a number for so many divisions.

During the final days of the foregoing campaign the main Russian advance pushed slowly into the Carpathian Mountains. These are unusually rough and difficult, and afford innumerable good positions for defense. Nevertheless, the Russians by 8 April reached the frontier near the divide into what had been Czechoslovakia but was now Hungary. The line was

Stanislawow (exc.)—Pantyr Pass—Jablonica Pass—Zabie—Strol Pass—Suczava River.

The mountain front was nearly 80 miles long.

On 8 April the 1st Ukraine extended its operations eastward from Cernauti and occupied Dorohoi and Botosani. The latter had been previously taken by the 2nd Ukraine on 27 March. The new operation consisted of an offensive moving southeast between the Siret River on the right and the Shisiuya River on the left. This attack connected with the 2nd Ukraine, also attacking southward just to the east. The attacking troops were largely motorized; they met little opposition and advanced rapidly.

50 miles were covered by evening of the 9th, when the Russians arrived at Zahorna (8 miles northwest of Iasi) and cut the railroad from Iasi to Pascani.

On 10 April enemy resistance stiffened, but the advance was pushed to Vultura, only 5 miles northwest of Iasi. Troops in rear exploited the initial success by crossing the Siret River and advancing to the line Radauti—Suceava with a view to extending the mountain line southward.

Hungarian troops this day started a general counteroffensive. They were aided by German units. The main attack came through the Pantyr and Jablonica Passes, and moved initially down the mountain valleys with the mission of taking Kolomyja. A secondary attack was begun at the same time by renewing the previous offensive moving southeast from the Stanislawow area. On the very first day the Hungarians cleared the two passes and with the help of a German Panzer Division entered Delatyn. A strong holding attack was delivered by Romanian troops, strengthened also with German armor, on the passes southward to include the Strol Pass.

On 11 April the German counteroffensive was extended north of the Dnestr. It advanced to the Strypa River, wtih a strong fight around Buczacz, which remained in German possession.

On the 12th fighting was general over the entire front. Attacks of the Axis made only slight gains, while a Russian attack south of Suceava advanced to Falticeni. On the 13th the Hungarians made considerable progress in clearing the passes, while the Germans north of the Dnestr crossed the Strypa. Very severe fighting occurred for several days, with both sides constantly attacking and counterattacking. The Germans were unable to push on across the Strypa. Further south Germans and Hungarians by their usual system of cautious advances occupied Nadworna on 18 April. Continuing onward, by 20 April the Axis forces had reached Ottynia, about 10 miles west of Kolomyja.

At this date the line on the front of the 1st Ukraine Army Group was

Turja River, with German bridgehead at Kowel—Luck (R)—Brody (G)—Tarnopol (R)—Strypa River as far as Buczacz—Tlumacz (?)—Ottynia (G)—Zabie (R)—Radauti (R)—Suceava (R)—Harlau (?)—Iasi (G).

The Carpathian Passes (including the eastern exits) seemed to be, and were claimed by Hungary to be, completely in Axis possession.

Campaign of the 2nd Ukraine Army Group

On 19 March the right of this army group was close to the Dnestr River in the vicinity of Yampol, while the left was 150 miles to the rear and east of the Bug River. The Germans were in the process of withdrawing, but they resisted when opportunities presented themselves. Although the front for a long distance was nearly parallel

to the Russian axis of advance, the major German resistance was on their right.

During the course of the 19th the Russian right reached the Dnestr in the Soroca area on a front of 35 to 40 miles. About 2 Romanian divisions retired so fast that they failed to destroy the bridges. On the following day the Russians' extreme right arrived at Mogilev Podolski, and on a 50-mile front they crossed the Dnestr. Without encountering major resistance the Russians by 24 March reached the line Mogilev Podolski—Balti (exc.) (Bielzy on some maps)—Floresti (inc.). Balti was occupied next day. The Germans avoided battle, withdrew westward across the Prut River. The right of the 2nd Ukraine was now almost on its objective, which was the line Iasi—Chisinau, and there were at the army group boundary. However, at this date the 1st Ukraine was on the right but considerably to the rear.

In the meantime heavy fighting had developed in the vicinity of Pervomaisk, a town at the confluence of the Sinyukha and Bug Rivers. A strong attack against this city was started on 21 March, when the Russian line reached Lysaya Gory, 7 miles to the north. Attacked from north, east, and south, Pervomaisk was taken on the 22nd. Attacks further south brought the line to the Bug River from Pervomaisk to Voznesensk, the Germans retaining a bridgehead at the latter place.

Now the Russians changed the location of their main effort westward, striking southward from the line Yampol—Gaivoron. This commenced on 23 March. On the 27th Savran was taken. On the 29th a severe battle occurred in which the Germans were thrown back and the Russians entered Balta. The Russian right met some resistance, and advanced at a slower rate; it reached Rybnitsa on 30 March.

In the meantime, across the Dnestr in Romania, the Russians had advanced against only light opposition. On 26 March they arrived at the Prut River from Balotina to Falesti. As the Germans held the far bank in force, no further advance could be made in this direction. On the 27th a Russian detachment crossed the Prut higher up and advanced into Botosani. This was not occupied permanently, but subsequently was taken by the 1st Ukraine as already related.

On 31 March the line of the 2nd Ukraine Army Group was

Mogilev Podolski (R)—Botosani (R)—Balotina (R)—Falesti (R)—Rybnitsa (R)—Balta (R)—Bolyshe Vradiyevka (?)—Voznesensk (R, to 3d Ukraine).

On 1 April the 2nd Ukraine advanced southward astride the Dnestr River. It did not meet strong resistance until the next day, and then only west of the Dnestr. On this date the Russians were moving toward Tiraspol on their left, but the right (after forcing a crossing of the Prut River north of Iasi) failed in its attempt to cross the much smaller stream of the Shisiuya.

On the 3d the Russians renewed the attack toward Iasi. It snowed all day, but the battle went on just the same. Some Russian gains were made: Carpiti (8 miles north of Jassy) was taken. Further east heavy resistance was encountered north of Orhei (Orgveyet or Orheiu on some maps).

New German divisions having arrived in the Iasi area on 4 April, a counterattack was made which recovered a small amount of ground. No attempt was made to push beyond what had been selected as a good defensive line. To the east the Russians pushed by Orhei and reached the Deel River, crossing it in places.

On 5 April German and Romanian troops attacked north from Iasi, advancing several miles. Armored troops breaking through and circling backward cut off one Russian combat group. The Axis troops did not hold all the gains; they were contented with repulsing the enemy and securing a better line of defense.

A rearrangement of Russian troops was made. It was decided to strike southward west of the Prut River from the Botosani area rather than to persist in a direct advance against Iasi, which obviously was behind very strong hostile forces. This attack was assigned to the 1st Ukraine Army Group. The 2nd Ukraine would assist by holding the enemy in its front and by attacking strongly in the direction of Chisinau.

On 8 April the new attack started off. The part played by the 1st Ukraine has already been described. It resulted in securing by 12 April the line Falticeni (R)—Pascani (R)—Targu Frumos (?). The 2nd Ukraine attacked from north of Iasi to Orhei, both inclusive. These attacks failed to make important gains. The advance east of the Dnestr on Tiraspol did gain.

On 9 April very heavy battles developed east and west of Orhei, with Axis troops holding less one sector where the Russians advanced. Russian gains were made toward Tiraspol. At this date the Germans were retiring westward along the Black Sea coast; it was therefore important that there be no Russian advance into south Bessarabia until after the withdrawing troops had cleared this area.

On the 10th the Axis troops closed in around the sector near Orhei where the Russians had advanced the day before. They failed to restore the line to its former position, but were able to prevent a further advance and even win a small amount of ground. Strong Russian attacks toward Iasi and northeast thereof failed.

On 11 April the battle continued between the Iasi and Orhei areas. The Russians attacked with strength, and the Axis made some counterattacks. The net result was to leave the line substantially unchanged. An effort to have the 1st Ukraine envelop the enemy's left west of Iasi failed. Axis troops drove back the Russians and recovered Targu Frumos. West of the Dnestr the battle died down on the 12th. East of the river the Russians captured Tiraspol.

On 13 and 14 April the Axis counterattacked on the line Pascani—Targu Frumos—north of Jassy. This recovered Pascani and a small amount of territory beyond the former lines. This operation appears to have been a mopping expedition. It met no great resistance, the Russians having established a main line of resistance further back.

On the 16th a Russian attack northwest of Iasi failed. Another due north of Iasi on the 18th had no success.

At the end of the period the line was

Targu Frumos (G)—8 miles north of Iasi—Koroneshty (?)—Orhei (G)—Beut River—Dnestr River.

Campaign of the 3d Ukraine Army Group

On 19 March this Army Group was practically on the Bug River, with the mission to drive west into south Bessarabia. Between Voznesensk and Nikolaev the Russians had some small bridgeheads across the Bug; they were endeavoring to enlarge these and establish new ones. Voznesensk and Nikolaev (both held by the Germans) were key points, as the main roads passed through these cities.

An attack on Voznesensk on the 19th failed. Renewing on the 21st, the Russians captured the city but promptly lost it to a German counterattack. On the 23d the Russians reached the edge of the town. On the 24th, using armor and self-propelled armored batteries, the Russians once more broke into Voznesensk. After considerable street fighting the place was captured.

Commencing on 22 March, daily attacks were made to cross the Bug south of Voznesensk. These met strong resistance and failed. An attack started the same day against the Nikolaev bridgehead did make progress. Nikolaev is situated between the Bug and Ingul Rivers, with a neck of land only 2 miles wide between them on the north side. The Germans had erected strong defensive positions with the usual mine fields, pill boxes, wire, etc. By 25 March the Russians were only 2 miles southwest of Nikolaev and were attacking all the way around by the east to include the north sector. On the 27th the Russians on the north were only 2½ miles away.

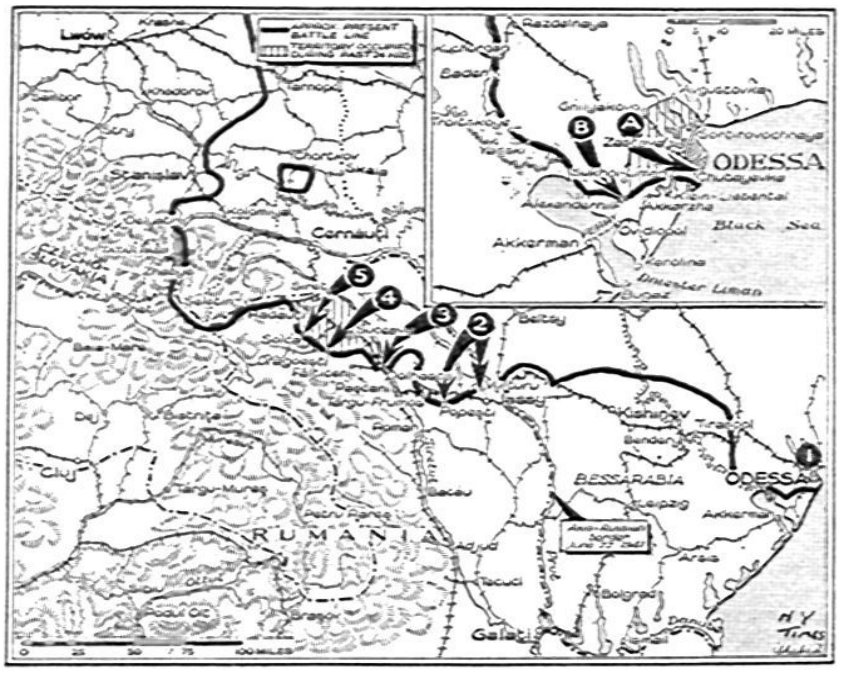
Early on the night 27/28 March an amphibious expedition landed south of Nikolaev, and advanced into the city. Heavy attacks with strong artillery support were made on the land sides. In view of this situation, the Germans started to abandon the city the same night, withdrawing westward by land. On 28 March Nikolaev, which had been the main Russian naval base on the Black Sea, was retaken. The Germans now abandoned the Bug River line and ordered a general withdrawal westward to the Dnestr River.

The Russians streamed across the Bug. On 31 March the line was Voznesensk—Landau—Ochakov, all inclusive.

The retreating Germans made their main rear guard resistance along the highway from Voznesensk to Odessa. A delaying action was fought along the Tiligul River, where the Russians were held until 3 April.

The Russians made their main effort on their right. After crossing the Tiligul, mobile troops pushed forward rapidly and reached Vesely Kut on 4 April. Next day they turned south and arrived at Razdelnaya, in rear of several German divisions (estimated as 5 or 6) holding the line of the Bolyshe Kujalnik in the vicinity of Ant Kodintsevo.

On 6 April the Germans withdrawing from the Bolyshe Kujalnik attacked northwestwardly toward Razdelnaya, with the aid of troops from the Odessa garrison. The Russian attack had its main effort



Toward the end of the period Odessa (1), held by the Nazis since October, 1941, was captured by the Red Army. The port fell after the Russians had speared to the sea at the suburb of Chubayevka (A on inset). At the same time the Russians, racing toward the Akkerman ferry to cut off the enemy's retreat, reached Alexanderhilf (B). In Romania the flanking of Jassy was pressed with the capture of Popesti and Vulturu (2). The Siretul River was forced along a 45-mile front above Dolhasca (3). Red units advanced to Suceava and Dragoesti (4) and to Radauti and Solca (5) to reach the Carpathians.

on the left along the Bolyshe Kujalnik River. Although there were but few roads and mud was deep, this Russian column advanced 12 miles southward.

On 7 April the battle was renewed; it ended on the 8th. According to Russian accounts the Germans (now estimated as 6 or 7 divisions) which had been on the Bolyshe Kujalnik, were destroyed. Announced German losses, however, were given as 12,000 killed, 4,200 prisoners, 193 guns, which would not account for the number of divisions stated to have been "liquidated." According to German accounts the divisions got by, their losses not being stated.

The Germans did not defend Odessa. They abandoned it, part of the garrison going by sea and part overland. The evacuation was completed on 9 April. The Russians occupied the city (the former most important port on the Black Sea) on the 10th. Without serious interference the Germans cleared the Dnestr River by 12 April, this part of their withdrawal having been rapid.

The Russians reached the east bank of the Dnestr on 14 April.

On the 16th two attacks, one north from and the other south of Tiraspol, succeeded in crossing and establishing bridgeheads. The Germans closed in around them. Attacks to expand them on 17 and 19 April failed. Attempts to cross the Dnestr further south made on 17, 18, and 20 April failed also.

At this date the line was

the Dnestr River, with Russian bridgeheads north and south of Tiraspol.

Crimea Campaign

The Crimea had long been held by the Axis, with a garrison of mixed German and Romanian troops estimated as about 8 divisions in all. These were disposed as follows:

a. Guarding the sole land connection with the mainland at the Perekop Isthmus, which at its narrowest point is 3½ miles wide. This isthmus was heavily fortified, and included a deep antitank ditch with revetted walls of stone and concrete.

b. A few troops east of the isthmus, where the Crimea is separated from the mainland by the Sivash, which is a narrow and shallow sea, extremely salty. On the south shore are numerous salt marshes and lagoons. As this appeared to be a difficult area to attack over, it was only lightly guarded.

c. At the east end a strong force held Kerch, less a Russian beachhead at Yenikale. The Russians had for long attempted to enlarge this beachhead, with uniform failure; same as regards repeated efforts to establish a new beachhead south of Kerch.

The Russian 4th Ukraine Army Group (Gen. Feodor I. Tolbukhin) held the north shore of the Sivash. The Maritime Army (attached, and based upon Caucasia) held the Yenikale beachhead.

On 22 March Russian attacks, which appear to have been reconnaissances in force, were made across the Sivash and near Yenikale. Continued the following day, they still had no great success.

On 5 April these attacks were renewed with no gains to the Russians. Next day only that at Yenikale was continued. It was made by about 2 divisions and provoked a strong Axis artillery fire which repelled it.

April 7th the 4th Ukraine launched its main effort against the Perekop Isthmus and across the Sivash. A tremendous artillery fire was directed against selected targets, and the Russians were able to get some men across the Sivash.

On the 8th Axis counterattacks kept the Russians south of the Sivash from advancing but did not prevent more Russians' crossing over. The water was so salty that horses would not stand in it. Guns and vehicles were floated over on barges and rafts; men waded across in part, or crossed on rafts and boats. The artillery preparation against the defenses on the Perekop Isthmus was increased in intensity. It was aided by an air bombing.

On 9 April the Russians, having accumulated enough men and materiel south of the Sivash, attacked southward and penetrated at several places what seems to have been a weak enemy line. The artillery and air preparation continued uninterruptedly against the Perekop Isthmus. It was followed by an infantry and tank assault, which found the fortifications sufficiently demolished so as to be able to work a way through. The defenders in forward lines were found to have been either killed or dazed by the long and tremendous artillery preparation. Resistance was slight.

On 10 April the Russians coming down the Perekop Isthmus in strength reached Armyansk. Just south of this place, the Germans had a second line of defense. South of the Sivash progress was made, with main effort in the direction of Dzhankoi, which was nearly reached.

The Axis strength opposite Perekop and the Sivash can hardly have exceeded 4 divisions on a front of over 30 miles. The German High Command decided that this was too small a force to hold a much superior Russian force which had already succeeded in piercing the prepared defenses. It was decided to abandon the defense of the Crimea, less the fortress of Sevastopol, to which place all Axis troops were to fall back.

On 11 April the Axis troops got a start. Their rear guard held south of Armyansk, around Dzhamkoi, and at the isthmus just east of Feodosiya. The Russians closed in. At Kerch the Axis abandoned what appears to have been rather large quantities of stores, including many guns in the prepared defenses.

Next day the Russians advanced rapidly, notwithstanding enemy mine fields. On the right, troops advanced southward from the Perekop Isthmus, while troops which had crossed the Sivash reached a point 36 miles south of Dzhankoi. On the east the Maritime Army approached Feodosiya, with main effort north of that town. The German rear guard activity centered largely in air action. Strong forces of fighters sallied out and attacked Russian armor. According to German accounts the air force on 11 and 12 April disabled 382 armored vehicles. The center of the Crimea is largely steppe country, affording in good weather few possibilities of avoiding air observation.

On the 13th the Axis rear guard held the line Yevpatoriya (exc.)—Saki—Simferopol. A heavy battle developed with the 4th Ukraine attacking from the north. The Maritime Army encountered the rear guard in their direction and drove it back from the line Staro Krym—Feodosiya. This was a 60-mile advance for them in three days. The Russians claimed to have taken 17,000 prisoners by the 4th

Ukraine, and 14,000 others by the Maritime.

At the end of the day the Axis rear guards abandoned their positions and fell back. The troops made their next stand at the line of the Belbek River—Demir Kapou (Hill 1538)—Roman Koch (Hill 1541)—Aiou Dagh (Hill 565) (on coast). (Note: heights are in meters.) This line united the two retreating Axis forces.

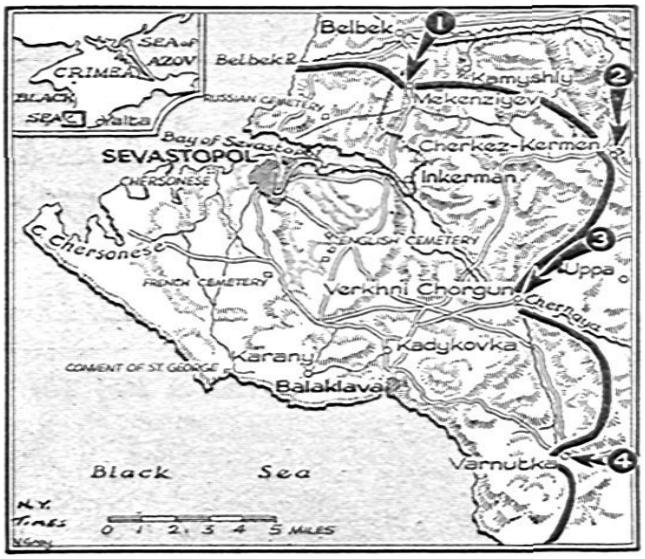
On 15 April the Russians attacked the left of the line. They gained a small footing just north of Sevastopol, but in general the attack failed. No better progress was made on the 16th. On the latter date the Maritime Army arrived in line to the east, and attacked toward Yalta. There are two roads leading to this city on the coast, one near the shore and another about 8 miles inland. Both go over mountains and have steep grades. There is much cover from vegetation. The upper was defended by the German 2nd Division, the coast road by their 98th Division. The Russians turned the left of the 2nd Division and attacked from the rear. Thereupon the Germans abandoned the right of the line and fell back all the way to the Sevastopol defenses.

On 16 April the Martime Army arrived at Yalta. Meeting little opposition they arrived on the 18th at Balaclava, where they were in touch with the main German lines of resistance.

On 19th April the 4th Ukraine worked southward east of the German main line and joined with the Maritime Army.

At the end of the period the Axis line was

high ground south of the Belbek River (has strong permanent defenses)—Cherkess-Kierman (?)—Churgoun-Karlovka (exc.)—Kadikoi (?)—Balaklava (exc.).



This was the Crimean situation near the end of the period. From the Belbek River the Reds had closed to points (*1*) *and* (*2*), *and toward the south had advanced to* (*3*) *and* (*4*), *ever squeezing the Germans trapped at and near Sevastopol.*

COMMENTS

1. It would seem that the present Axis line from Kowel south to the Carpathians, inclusive, is a line which is to be held. In confirmation British accounts state that the German GHQ Reserve has been moved to and assembled in the area Radom—Kielce. This would be a proper location for supporting the line "as is" at date of writing.

2. In south Bessarabia the Axis line through the areas of Iasi and Chisinau and the Dnestr River is a good line of defense. Strategically it could retire in this sector to the line of the Carpathians—Galati—Danube River. On account of the agricultural products of the country that would be abandoned in this case, such a retirement will probably not be made unless forced.

3. This period has seen the envelopment by the Russians of several German forces. In no case has complete success been obtained. At Kowel a German relief force broke through to the besieged. At Tarnopol, a part of the garrison broke out and met a relief force. Against Hube's motorized army, he was able to break out and join a relief force.

4. These examples bring to mind old rules as to sieges, which are just as true today as they ever were. They apply equally to a fixed place, such as Tarnopol and Kowel, and to a movable area, covered by an army in being, as in the case of Hube.

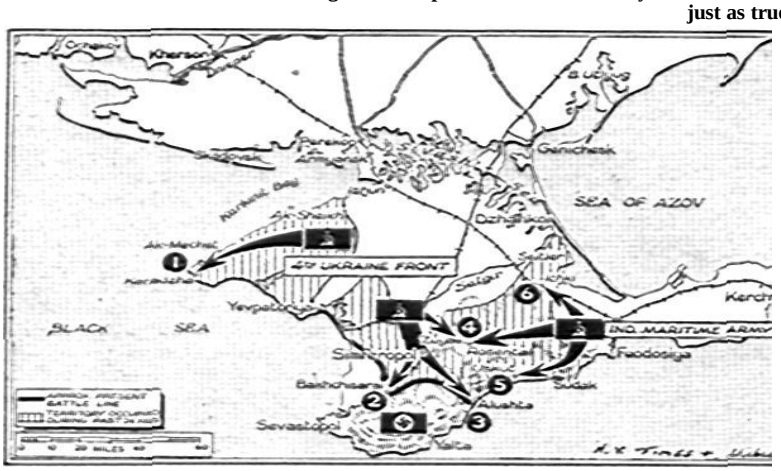
5. There are two ways in which such a situation can be handled. The besieging or encircling force may first dispose of relief forces, by destroying them or driving them off to a great distance. An excellent example is Grant's campaign against Vicksburg, where he first disposed of relief forces before proceeding actively with the siege.

6. The other way is to go ahead with the siege and at the same time establish covering forces against relief expeditions. For this purpose two lines of resistance are required by the encircling force, known technically as

contravallation—to keep the encircled force from breaking out; and

circumvallation—to keep the relief force from breaking in.

It seems probable that in our modern military schools too little instruction has been given in problems of this kind. The experiences of the great campaigns in Russia should bring out the necessity for staffs being prepared to handle such situations. With the rapidity of movement now possible with motorized transportation these may arise on very short notice.



The pattern of recovery of the Crimea clearly appears from this map. This was the situation in mid-April.

THE WAR IN ITALY (19 Mar to 20 Apr 44)

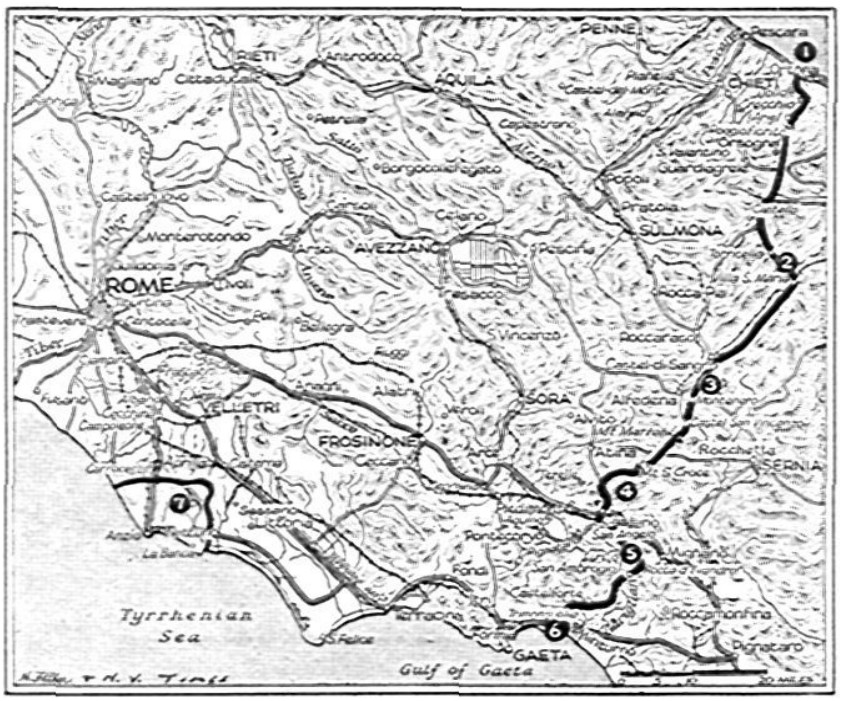
Only minor fighting has occurred, limited to patrol and raid activities. At the beginning of the period the line on the main front was

3 miles north of the mouth of the Garigliano River—Minturno (Allies)—Castelforte (G)—San Ambrogio (G)—Cassino (?)—Terelle (G)—Mt. S. Croce (G)—Alfedena (A)—Castel di Sangro (A)—San Angela (A)—Torricella (A)—Casoli (?)—Orsogna (G)—3 miles north of Ortona.

As an aftermath of the great air attack on Cassino which had taken place on 15 March, this sector was quite lively at the beginning of the period. The Allies were endeavoring to cash in on the results obtained from the unprecedented bombing and a subsequent terrific artillery preparation. The Germans were seeking to recover lost territory.

It was found that Cassino had been thoroughly destroyed, but that the ruins of the buildings were at least as difficult to capture, where defended, as the buildings had been before. The Allies advanced from the north to occupy the flattened town, and the Germans from the south to reoccupy it. Both sides used tanks and infantry in small parties.

At the same time the Allies were seeking to complete the capture of the hills just west of Cassino. The enemy held the summit of the Abbey hill, including the ruins of that ancient monastery. Two hundred yards below, on a spur known as Hangman's Hill, were Gurkha Infantry from an India Division. Other India troops had



Revised versions of the main battle line in Italy pull the Allies back about 3 miles northwest of Ortona (1). The Germans also regained territory below Toricella (2), and we have lost Alfedena and Montenero (3). The Allies moved forward toward Terelle (4), but near Trimonsuoli (6) their position is about 1½ miles farther back. Near the end of this period the Germans vainly tried to infiltrate north and cast of San Ambrogio (5) and were active near Aprilia (7).

already taken Castle Hill (which had a medieval castle on it) and a spur to that hill known as Hill 165. The enemy held the base of Abbey Hill, which was adjacent to Route 6, and the west edge of Cassino. This sector closed the only road, a very steep one, which led up to the top of Abbey Hill. The Gurkhas on Hangman's Hill were thereby cut off from direct communication with their division. They were supplied by air with food and ammunition. Principal difficulty was in supplying water.

On 19 March, at 0600 hours, the German 1st Parachute Division (Lt. Gen. Richard Heidrich) attacked Castle Hill and by 0800 hours had recaptured it, including the spur Hill 165, which is only 100 yards from the medieval castle. India troops counterattacked promptly and retook the castle but failed to retake the spur. At 1530 hours the Germans reattacked, advanced a few yards, but were unable to enter the medieval castle. The result of this action was the reoccupation by the enemy of Hill 165, whose position made it still harder for the Gurkhas to remain on Hangman's Hill.

While the foregoing engagement was under way other German troops from the same division entered Cassino near the west exit of Route 6. They were able to seize a few ruins and organize these into centers of resistance. German tanks took fixed positions within ruins. Tanks so placed and appropriately camouflaged are hard to locate. The rubble of surrounding demolished structures affords protection against all except direct hits. New Zealand troops counterattacked and made gains which, however, they were unable to hold.

During the period 19 to 23 March the Germans made slow progress in south Cassino, while the Allies made a similar slow progress in the north sector. As this fighting was unsatisfactory, on 23 March Cassino was heavily shelled by American 240-mm howitzers. This failed to cause the enemy to withdraw. At the end of the artillery fire it was estimated that the enemy held approximately the west edge of Cassino and part of the south quarter, amounting to about ¼ of the village. Reconnaissance developed that the Germans had at least six established centers of resistance within Cassino, and were steadily pushing in.

Similar fighting continued for several days. The main mission of the Allies was to complete the capture of Abbey Hill or else relieve the cut-off Gurkhas, only 200 yards away from the objective. All efforts to take the Abbey failed. It was therefore decided to abandon this mission and concentrate on relieving the Gurkhas. During the night 27/28 March the Gurkhas abandoned their position and started to rejoin their division. According to the Allied account this was accomplished. According to the German version some of the Gurkhas were surrounded near the foot of the hill, near the foot of the road. Here they held out until 30 March, when the last of them were overcome.

Since that date this sector has been relatively tranquil, except for artillery fire.

Elsewhere on the south (or main) front there has been constant artillery and patrol activity. The number of raids made has been large, many more than in the preceding World War. Whereas the main mission of raids has been to capture prisoners and thereby secure identifications and information, there is a growing tendency when a raid succeeds in entering a worth-while position to reinforce the raiders and hold on. This has resulted in modifications of the front line. As the front, in order to avoid excessive losses from artillery fire, is often lightly held, it has not been unusual for a well conducted raid to advance as much as 2 miles into hostile territory. If properly organized and prepared the raiders may in such cases occupy some predetermined line where they can be temporarily protected by their own artillery defensive barrages until the new position can be consolidated.

Unfortunately the gains in this direction, during the period, have been almost exclusively in favor of the enemy. This has resulted in the line at the end of the period being as follows:

2 miles north of the Garigliano River (Allies lost about 1 mile)—Minturno (Allies)—Castelforte (G)—San Ambrogio (G)—Cassino (?)—Terelle (G)—Mt. S. Croce (G)—Montenero (?) (Allies here lost Alfedena and about 2 miles)—Castel di Sangro (G) (had been held by Allies)—Villa Santa Maria (?) (Allies lost about 3 miles from the Villa Santa Maria line)—Torricella (A)—Civitella (G) (had been Casoli)—Orsogna (G)—1½ miles north of Ortona (had been 3 miles).

These changes, minor in themselves, have been fairly evenly distributed over both flanks and the center of the line.

At the Anzio beachhead, raids with patrol and artillery activity have marked the period, without important changes. On 31 March a German raid northwest from Campo gained an initial 1½-mile advance, some of which was retained. The territory in this vicinity contains woods of cork and of beech saplings, with interspersed tall Italian umbrella pines. Numerous gullies facilitate infiltrations. A further enemy attack on the following day by about a half battalion made at dusk and continued until midnight failed to gain ground.

A raid by Americans was made on 15 April near the southeast of the perimeter, in a direction parallel to the sea. Using armor it advanced 2½ miles within the German lines, where it was stopped by a fortified village and strong points. It then returned to its own lines without having had any casualties other than two motor vehicles disabled from running over mines. 61 prisoners were taken, of which 16 were Italians.

At the end of the period the line was

a point on the coast 10 miles northeast of Anzio—thence due east about 5 miles where the line is dented to a depth of about 1 mile—around the dent on a prolongation of the line from the coast, to a point about 2 miles southwest of Cisterna—thence south to a point on the coast 1 mile east of Astura Creek or about 7 miles from Nettuno.

All parts of the beachhead are subject to enemy artillery fire. According to German accounts their main targets are the beaches, dumps adjacent thereto, and ships off-shore unloading cargoes.

COMMENTS

1. On the German side Italians in small numbers have been reported fighting with the Germans. A much larger number are engaged in rear areas in transportation and supply services. A congratulatory radio from Japan has been noted on the reconstitution of major Italian units under Mussolini. Appearance of such units in line has not yet been found.

2. Both sides are employing propaganda to induce Italians opposite to change sides. Tracts and pamphlets are dropped from the air and are fired in forward areas by artillery shells. There is no reliable information as to what effect, if any, has been obtained.

3. There is a growing recognition that more and heavier artillery is needed to get ground troops forward. Destruction of stone towns and of large buildings by air bombing may be spectacular, but unless the defenders are driven out is not particularly useful.

THE WAR AGAINST JAPAN (19 Mar to 20 Apr 44)

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

BURMA-INDIA AREA

General activity has increased on three fronts, although none involve large forces. The three areas are the coast (or Arakan), central (or Manipur), and north.

Arakan Area

The Japanese offensive which had commenced in February had at the beginning of this period been exhausted, with a return of the opposing troops to approximately the original line. This extended from Maungdaw near the coast and in British possession to Buthedaung on the Mayu River and in Japanese possession. A road joins the two towns and passes through the intervening Mayu range in part through two tunnels. The enemy held the ridge and the runnels.

The British had passed to the offensive, and with elements of two India divisions were attacking southward on both sides of Buthedaung. Another British force was attacking along the coast beyond Maungdaw. An auxiliary British force of West African troops was in the Kaladan valley, facing south and about opposite Buthedaung.

The main British effort was to clear the Maungdaw—Buthedaung road, to open a convenient line of supply to their troops in the Mayu valley. As the west end of this road was already held, operations consisted of a series of limited attacks, through hilly and jungle territory against the enemy in the Mayu range and about Buthedaung.

The Japanese resisted strenuously and counterattacked frequently. Tanks and artillery were used. Due to the cover afforded by the jungle, the operations of the Air Force were less important. The British made steady advances. By 26 March they were on top of the tunnels. These were not finally cleared until 6 April. By this date Buthedaung had been taken, with some enemy still north of that town. With the opening of the road Buthedaung becomes the roadhead, and it was a minor matter that the enemy held positions to both north and south. Slight advances were made on the coast.

After 6 April operations slowed down and the sector tended to become stabilized.

On 19 April, as this account closes, the Japanese started a counteroffensive. This crossed the Kaladan Valley about 35 miles north of the located position of the West Africa troops in that valley. The enemy moved west and occupied Paletka without serious opposition. As this account closes this hostile force is in a position to turn south and attack the West Africa troops, or else cross the mountains to the west and operate against the coast road, which is the British line of supply to their forces on the coast, at Maungdaw and beyond.

Manipur Area

As this period opens a Japanese force estimated as about 3 divisions were conducting an invasion of Manipur. These Japanese troops were aided by an India National Army of unknown strength, but apparently less than a division.

As this account opens the situation was:

The 17th India Division (Maj. Gen. A. T. Cowan) was in the general vicinity of Tiddim. This division had been in Burma in 1941 when the war against Japan started. It withdrew from Burma by the road through Tiddim, and had been guarding this area ever since. For the first time since May, 1942, it now found itself engaged with major enemy forces. By infiltrations through the jungle mountains the 17th India Division was cut off from supplies, except as these were brought in by air.

The 23d India Division was in support of the 17th, and was in the general vicinity of Bishenpur, on the west shore of Lake Logtak, which is about 12 miles in diameter. At this point a trail extends westward to Silchar on the Bengal & Assam RR. A road extends eastward across the mountains through Palel to Tamu in Burma. The enemy was advancing over this road and was being held, to prevent his cutting the main highway from Imphal to Tiddim, which crossed the east and west trail and road near Bishenpur.

At Imphal, a long straggling village of about 75,000 people, was the British reserve, reported to be the IV Corps, mostly of corps troops.

At Kohima, 60 miles north of Imphal, was a British Home Counties regiment, guarding the main line of communications which led to the railhead, 45 miles further to the northwest at Dimapur, also on the Bengal & Assam RR.

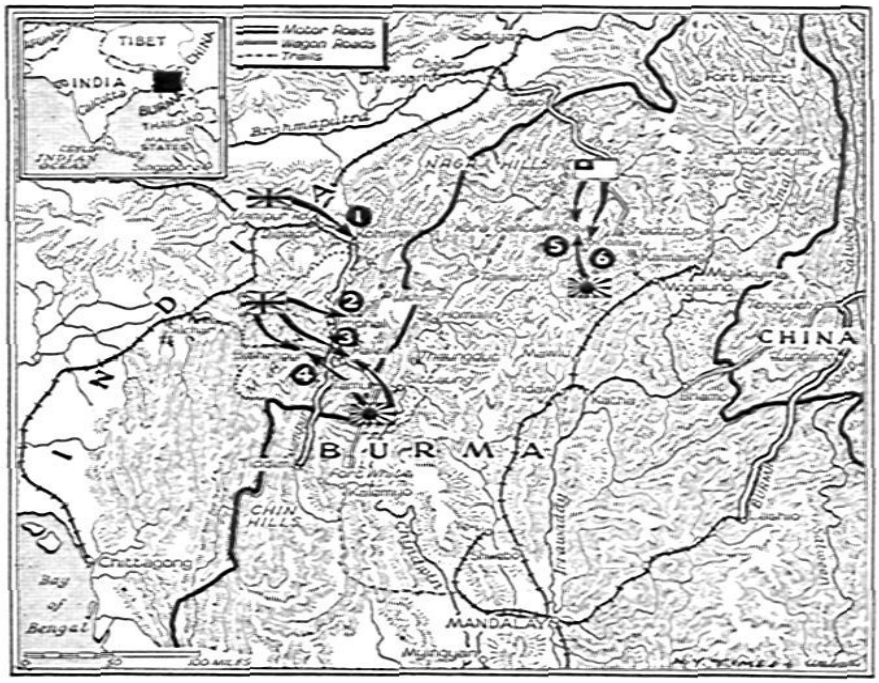
The road from Dimapur through Kohima and Imphal to Tiddim is an all-weather hard-surfaced road. Trails diverge at right angles across the mountain ranges, which run in parallel ridges generally north and south. The trails were supposed to be impracticable for motor vehicles, except the one through Palel to Tamu. All trails were guarded by security and observation detachments. The Allied air force dominated the air, but on account of the jungle could not be counted upon accurately to discover enemy dispositions.

The Japanese division operating against Tiddim and westward from Tamu had started on 8 March from their bases on the Chindwin River, and were actively engaged against the British who had stopped the advance.

Another Japanese division based on Homalin, also on the Chindwin River, started west from that place on 15 March with Ukhrul as the immediate objective. This movement had not yet been discovered by the British. Still another Japanese force, based on Tamanthi, was en route across the mountains toward Kohima and had so far evaded discovery.

The Chindwin River is navigable throughout the year as far north as Homalin, and the Japanese could be supplied by water transportation as far as this point. North of Homalin the Chindwin is navigable to Tamanthi only during the rainy season, which had not commenced at this time. Roads parallel the river, while others lead eastward from the Chindwin valley to the valley of the Irrawaddy, which has both road and railroad communications. It is probable that the Japanese accumulated supplies for a considerable period and stored them in forward areas, so as to be temporarily independent of their communications. They had had two years to consolidate their establishments in this region.

On 19 March minor engagements took place in the Tiddim area. Next day the British noted what they believed to be two small hostile detachments near Kohima. This caused no special alarm. More attention was given to a report from the outposts that a strong force



At the end of the period British and lndian troops broke through roadblocks to relieve Kohima (1). Around Imphal (2) the Japs were driven further beyond the plain and lost 3 important positions. They attacked, however, near Palel (3) and southwest of Imphal (4). In northern Burma the Chinese threw back 3 Jap assaults at Kora Gahtawng (5), and approached Lonkin (6).

of all arms was advancing westward across the mountains toward Ukhrul. To meet this threat orders were issued to move certain troops from the Bishenpur area northward to confront the new enemy. It took until 24 March to complete this concentration in the Ukhrul area. In the meantime operations were continued southward from Bishenpur against the enemy in rear of the 17th India Division.

The Japanese were able to reach Ukhrul before the British, and they occupied it. They improved the trail which they came and made it passable for artillery and trucks. This was the same trail over which General Stilwell retreated from Burma in 1942, but at that time it was practicable only for foot passage. The distance from Homalin to Ukhrul is about 40 miles. It had taken the Japanese eight days to move this distance and then deploy their troops at the exit of the pass.

On 24 March the Japanese attacked southwest of Ukhrul, with main effort on their left. This attack made progress; it reached a line about 30 miles northeast from Imphal, but still in the jungle-covered hills. An attack on the ensuing night failed to advance the Japanese line. The next attack, on the 27th, was very determined but indecisive.

Under cover of these attacks the Japanese pushed a substantial force north of Ukhrul which reached the vicinity of the Kohima—Imphal road on the 28th. The British at first were under the impression that this was only a hostile patrol; by the 30th it became evident that it was more. On this day also a large enemy force was identified in the hills just east from Kohima.

In the south the enemy was attacking northward along the Tiddim road against the 17th India Division, with main effort on the west flank. Here Japanese were pushing north around the British, and were approaching the Lake Logtak area. On the road from Tamu the enemy was acting vigorously, and had reached a point approximately half way to Palel.

In view of this situation the British abandoned the attempt to relieve the 17th India Division. Orders were issued to that division to evacuate Tiddim and retire north to the vicinity of Bishenpur. This movement broke through the enemy's line and was completed on 30 March, with the enemy closing in behind the retreating troops. The Japanese column from Ukhrul was now 25 miles northeast of Imphal, still in the hills.

As the Japanese operation was now recognized as a serious effort, the British ordered in new troops. The III Corps was directed to assemble near Dimapur. Japanese accounts state that some British troops were flown by air from Arakan, thus possibly accounting for the suspension of British activities in this area. This has not been confirmed as to the troop movement, but is correct as to the reduction of activities. Since the Japanese had crossed the main highway between Kohima and Imphal, it was impracticable to supply the Imphal area from the railhead. Work was immediately started to improve the trail from Bishenpur to Silchar. The British around Imphal concentrated to defend the Bishenpur area, in order to:

a. keep a line of supply open to Silchar;
b. prevent a junction of the Japanese attacking northward from Tiddim, with those attacking westward from Tamu.

Other British troops were operating to prevent the Japanese about Ukhrul from reaching the Imphal plain. A detachment was detailed to prevent the enemy from advancing southward along the Kohima road. Allied air forces daily attacked the Japanese trails and roads to their bases. It was hoped that this would materially interfere with the enemy's ability to wage a long campaign, and that he would soon have to retire from lack of supplies.

It was believed that the Japanese intention was to cut the Bengal & Assam RR, a main line of supply for the Allied troops in north Burma along the Ledo road. This railroad was guarded. It was impracticable to guard every foot of it against small patrols, but all sensitive points were protected.

Heavy fighting developed in the Ukhrul and Kohima areas. The British attacked constantly and limited Japanese gains in the direction of Imphal. They were not so successful as to advance north of Ukhrul, and Japanese forces crossed the road to Kohima, advancing westward. At the same time they closed in around Kohima and isolated the garrison at that place. The Japanese failed to pass the British cordon around the Imphal plain.

The Japanese division from Tiddim failed to break the British defense across the main road. This runs through a continuous deep valley of little width, and is easy to defend. At places it is a gorge not over 500 yards wide. The Japanese got out of the valley on the west side and despite very difficult terrain approached the Silchar trail. On 9 April some Japanese were close enough to bring fire to bear on the trail, which by this time had been made practicable for jeeps.

By 11 April the Japanese from Ukhrul had occupied positions westnorthwest from Imphal. They were unable to get into the plain. At this time the enemy had a half-circle around the north side of Imphal. The Japs on the Tamu road were still fighting but were being held 20 miles east of the Imphal—Tiddim road.

The British III Corps, having assembled in the Dimapur area, moved east and commenced operations initially to relieve Kohima, now surrounded by the enemy. The British regiment there took a hedgehog position on a 500-foot ridge in the west part of the town, previously the site of the British colony.

On 13 April the Japanese from the Tiddim area were on the Silchar trail with small detachments. On account of the length of this trail and its location parallel to and just back of the front, it was nearly impossible to prevent the enemy from interfering with traffic. As the entire Imphal plain—about 30 miles wide and 60 miles long—was in British possession, the superior Allied air force was always able to bring in supplies as required. Replacements and reinforcements could also be moved in.

In this way the British accumulated a sufficient force to stage an offensive launched northeast from Imphal toward Ukhrul. On 15 April this captured some heights suitable as a line of departure for a further effort. This occurred on the 18th and was continued on the two following days, at which time the British had advanced to a line approximately the same as that held on 24 March—30 miles northeast of Imphal.

On 16 April the British reopened the Silchar trail without driving the enemy away from the vicinity.

The III Corps from Dimapur (of British and India troops) was not seriously opposed in its advance. It relieved the Kohima garrison on 19 April by penetrating the Japanese line in the jungle on the northwest side. To accomplish this task the corps artillery concentrated on a front of only 150 yards. Some of the guns were only 700 yards from the target. This punched a hole through the enemy's single line, and Kohima was relieved.

At the end of the period the situation was:

a. A British force in the vicinity of Bishenpur separates two hostile forces, one immediately to the south astride the Tiddim road and the other 20 miles to the east on the Tamu road, Small hostile parties continue to threaten the Silchar trail.
b. A British force holds a semi-circular position on a radius of 30 miles northwest, north, and northeast of Imphal in immediate contact with an enemy force based on Homalin and Ukhrul. This hostile force occupies at least a 15-mile segment of the road to Kohima.
c. Kohima is held by the British and the line of supply to Dimapur is open. The enemy is close to Kohima on the north, east, and south, with Japanese patrols 20 miles northward.

North Burma Area

At the beginning of the period an Allied force consisting of Chinese units plus an American detachment of infantry and tanks occupied a line from Taro to Jambubum protecting the construction of the Ledo road. Ledo is the railhead on the Bengal & Assam RR—a meter-gauge road leading to connections with a broad gauge railroad to Calcutta. The newly constructed Ledo road is to connect with the Burma road which, starting at Bhamo in Burma, extends to Chungking, China. The Allied force is covering the engineer troops extending the road.

The immediate objective was to advance southward down the Mogaung valley to Mogaung. This valley is 4 to 6 miles wide, with sides rising from 1,000 to 1,500 feet. It affords suitable positions for defense, but the enemy has in general not offered much opposition.

On the night 18/19 March the Japanese withdrew from the vicinity of Jambubum with all their equipment, and crossed the divide leading into the Mogaung valley to a position north from Shaduzup, about 50 miles north from Mogaung. A Chinese unit plus an American detachment turned the enemy's position from the east and on 24 March were able to enter Shaduzup in rear of the enemy, estimated as only 1,000 men. About half of these are believed to have been lost, the other half managed to escape.

The Allied advance was renewed on 30 March. It reached Wakaung on 5 April, and has since advanced about ten miles.

To the east a British force of native troops has moved south from Sumprabum. It appears to have advanced about 15 miles during the period and is near Tiangzup, abreast of the China troops in the Mogaung valley.

Slight advances have been made by China troops south of Taro, where the front is at Pumsin. The three Allied forces are operating in separate valleys, and do not have a continuous line. The enemy is withdrawing, and during the period made no serious resistance.

Miscellaneous

Allied troops brought by air and previously dropped in central Burma, have been operating throughout the period. Their original mission was to aid the Allied troops in north Burma, by disrupting enemy communications between Katha and Myitkyina. Since enemy's advance into Manipur the mission of this force, to which the name of Chindits has been given, has been extended to operations against bases on the Chindwin River. There is little information as to what this force has accomplished, but after two months it has avoided being surrounded by the enemy pursuit forces and has caused a number of demolitions.

The original commander, Brig. Gen. Wingate, was killed in an air accident on 28 March. The new commander is Maj. Gen. W. D. A. Lentaigne (British Army). The Chindits are regularly supplied with ammunition, replacements, and food as necessary by air.

BENGAL SEA OPERATIONS

On 15 April the U. S. 10th Air Force raided Port Blair. This is a magnificent harbor in the Andaman Islands. No great damage is claimed to have been inflicted by this raid.

On 19 April a British Task Force, in which Americans participated, launched a carrier-based air raid which attacked Sabang, a small island just off the northwest tip of Sumatra. It is claimed that this raid caused considerable damage to shore installations. Japanese reports are that the damage caused was slight.

NEW GUINEA

An Allied ground force which had been originally in the Ramu valley crossed the divide and on 22 March arrived at a point in the Mintjim valley, 7 miles southwest of Bogadjim. Another Allied column advanced westward along the north coast and was approaching the Kaula River east of Bogadjim.

No details of these operations have been released. Bogadjim was occupied on 14 April. Since it took 24 days to advance 7 miles, it is presumed there was some enemy opposition.

An intensive air bombing of the enemy-held Wewak area, and of the coast on both sides of Madang, has been under way. The average weight of bombs dropped per attack was respectively 114 and 116 tons, there being 15 attacks on Wewak and 9 on the Madang area.

Commencing in April, the weight of air attacks shifted to Hollandia and Aitape, with 3 attacks against the former at an average weight of 258 tons of bombs dropped and 1 against Aitape with 284 tons.

ADMIRALTY AND MATTHIAS ISLANDS

The previous occupied Admiralty Islands have had their occupation forces extended to include Rambutyo Island, in addition to Los Negros and the main Manus Island.

U. S. Marines have been landed on two of the St. Matthias Islands—Emirau and Mussau. On the latter there was an enemy radio station. There was no opposition.

NEW BRITAIN

The enemy has abandoned the central part of the island and is concentrating in the east quarter. During the period of 32 days, the Rabaul area was bombed 26 times by Allied planes. Average weight of bombs dropped was 76 tons, with a maximum on one day of 160 tons.

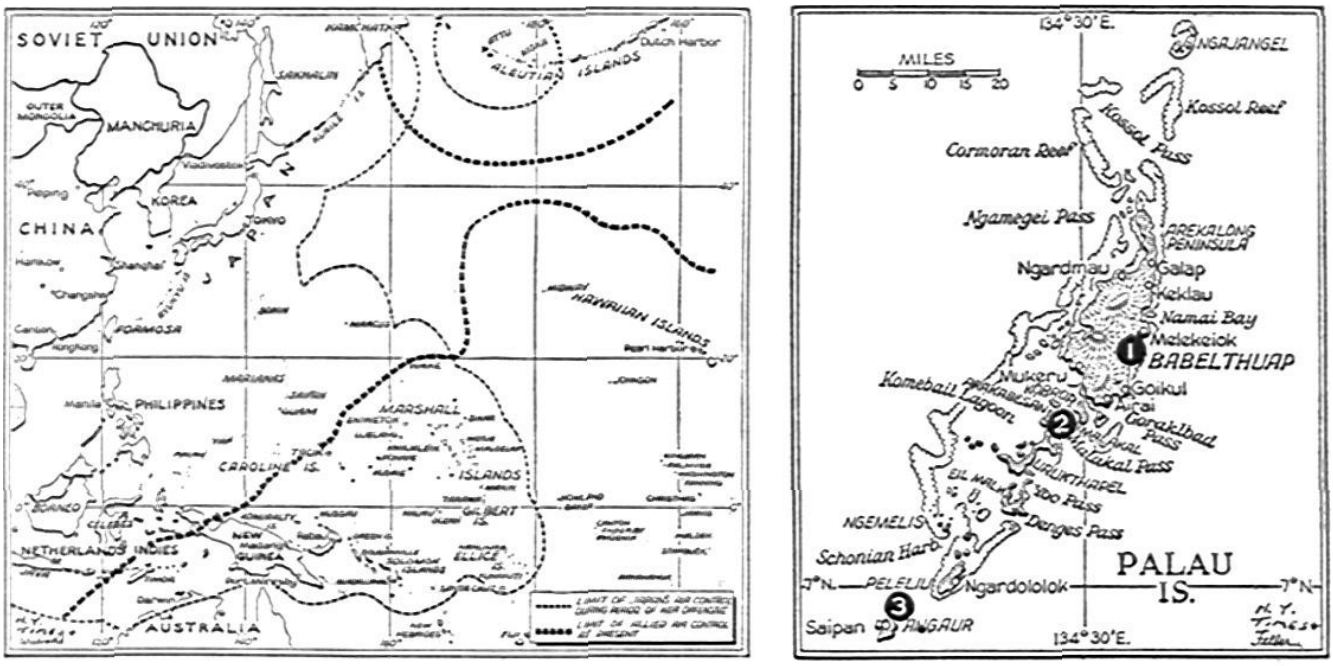
NEW IRELAND

On 20 March, the enemy's main post at Kavieng was shelled by the Navy. More than 1,000 tons of ammunition were fired in 3½ hours, or 5 tons a minute for that period of time. Kavieng was bombed on 5 other occasions, an average of 43 tons being dropped each time.

BOUGAINVILLE

Allied troops, estimated as about 2 divisions or equivalent, maintain a beachhead about Torokina Bay. This has been enlarged eastward to a depth of about 2 miles. An enemy attack on 26 March was repulsed. Enemy bases at both ends of the island have been regularly raided from the air. Enemy positions along the coast have been bombed, and shelled by the Navy.

Two Japanese divisions, including the 6th, are reported present on Bougainville.



At one of his last press conferences the late Secretary of the Navy Knox displayed 2 maps, combined at left above, to show how the Pacific air picture has changed in the last 2 years. Palau's strategic situation is clear on the general map; the detailed map shows sites of recent naval gunshell and bomb damage there: an ore dock on Babelthuap (1) was damaged, as was a phosphate plant on Anguar (3); warehouses, dumps, and hangars were destroyed on Korror (2) and other destruction was widespread.

"SOUND RANGING"

By Lt. William A. Barnes, Jr., USMC

ABOUT THE AUTHOR

Two days after graduating from Harvard University in 1942, Lt. Barnes entered the Marine Corps. He went through the Marine Corps Schools at Quantico, emerging as a graduate of the Field Artillery School there. He has served with the 3d Marine Division ever since. For a year he was a battery forward observer, including a couple months' combat on Bougainville. At present he is a battery RO.

The biggest problem the artillery face in the jungle is the almost complete lack of observation. Some islands (such as Guadalcanal) do have rolling grasslands with possibilities for normal hill OPs, but most of the Southern Pacific islands are like New Georgia and Bougainville, which are heavily covered with rain forest. Even though the forward observers up with the infantry have no more observation than a mole burrowing in the ground, they are still expected to deliver effective supporting fires. This isn't easy to do, for it has a good deal of the "crystal ball" in it—but it can be done. It won't be any where near as accurate as normal observed fire, but it will do the job. The best way to explain the method is to take a typical situation and go through the solution step by step.

We assume that on this particular day an expansion of the force beachhead line has been ordered. Little opposition is expected, for patrols have made only desultory contacts with the enemy. The infantry battalion with which the observer is working has been given an azimuth on which to advance and a distance to go. When this distance has been covered in the proper direction the battalion will stop, dig in, and reestablish contact with units on the flank if contact has been lost.

Early in the morning the battalion with the observer with his wire and radio teams starts the advance slowly and cautiously.

In the early afternoon, after passing through a small stretch of swamp, enemy rifle and machine gun fire is received from a low hill rising from the swamp. The infantry battalion commander pushes ahead to develop the opposition and locate the enemy flanks. As is often the case, what starts as a small firefight soon boils up into a considerable shooting scrape. The enemy pushes more men into the fight, as do we, and things begin to look serious when a few rounds from one of those big Japanese 90-mm mortars come slamming into our position.

By this stage of the game the observer has his phone on the wire and is telling the "Three"* his troubles (of which he has plenty). He does not know where he is except in very general terms, for in the jungle it is extremely difficult to tell how much ground has been covered. Also, compasses don't work too well in some parts of the islands. To add to things, he can't see more than twenty feet in front of him and by this time (if things are proceeding normally) each side is so mixed up with the other that the fight is banging and thumping on all sides of him.

Being a man who is not easily discouraged (or he shouldn't be there), he gets out his lensatic compass and his 1:40,000 aerial photo (which is about as legible as a damp piece of toilet paper after being in a muddy foxhole all night long). Then he goes to work.

First he may have to tell the infantry that they must withdraw a little to get artillery fire. This isn't easy to do and Ft. Benning says it's lousy tactics, but it sometimes must be done. Fire fights in the jungle are conducted at ranges of 15 to 30 yards—which makes it impossible to fire artillery without hitting friendly troops. Usually the infantry is very cooperative in such matters. To an infantry battalion commander Harry James playing "You Made Me Love You" doesn't sound nearly so sweet as ten volleys from a battalion of artillery coming down into the Japs.

While the observer has been performing his liaison function the "Three" has been trying to get from a set of 1:5,000 stereo pairs an idea of the observer's coordinates. Whether in this case an exact estimate of those coordinates can be made or not, the "Three" throws a round out well into enemy territory. If it is possible another observer located some distance from the officer conducting the adjustment should be cross-jacked into the line. It is best for the two observers and the "Three" to all talk together on one line, for a lot of misunderstanding can be avoided by the direct personal contact.

When the crash of the round is heard in the jungle an azimuth is taken by both observers. By a plot of the back azimuths the FDC can get some idea of the relative positions of the observers.

After due consultation among the three people on the line a spot (or sensing) is decided upon for the round. And here we have an extremely important variation from standard procedure.

The observers do not sense in relation to the gun-target line, but instead sense in terms of East and West, North and South. So a typical sensing would be, *400 North, 200 West*. Of course the FDC must plot each shot and measure a new range and deflection for the adjusting battery, which makes the process a slow one. But we found in combat that the average number of rounds required for a sound adjustment was cut down from around 15 to 7.

The reason for this is simple. Almost every field artillery officer has seen someone fire forward observation and attempt to move both elements at once before being sure of the guntarget line. The result is that the adjustment goes around the target. And in the jungle with no observation it is impossible to visualize a gun-target line. Hence this unorthodox method of sensing.

Once the observer has "hold" of the adjustment he carefully brings the fire closer to his own position. When he is getting "warm" the whistle of the shell will help him judge where the projectile is falling. When he is about right he will be able to hear the rush of the shell distinctly, and the explosion

*Equals FA's S-3.—Ed.

will be very loud. Generally an inexperienced observer will think that the burst is a lot closer than it actually is. The noise overhead is a good indicator. If the shell bursts some time after it passes overhead the burst is too far away. And whether you like it or not, it is an axiom that in a sound adjustment the burst must be *close* to the observer or else he cannot be sure where the rounds are falling. Only when they are bursting nearby is it possible to be sure that there will be effect.

The apparent distance of the fall of shot varies greatly between a tree burst and a round which falls into some swampy ground or into a gully. A simple way to check the range is to fire two rounds at the same range but with a slight change in deflection.

Once the adjustment has been completed fire for effect is delivered in the normal way. Plenty of ammunition must be used to search the area thoroughly, for the adjustment is never very precise and the heavy jungle growth greatly reduces the effect of fragmentation.

Lastly, the Japanese is a very cagy little man and he can be doing several things behind that wall of vegetation. He will often move if he knows he is in for a heavy shelling. Sometimes he will pull out entirely; a couple of volleys at a greater ranges will get this out of his mind. Often he will move off to one side and attempt to catch the expected attack in the flank. And occasionally he will move toward the infantry. This latter trick can be nicely stopped with rifle grenades and 60-mm mortars. If the situation permits, the infantry always should cover the area between themselves and the concentration with fire from light weapons or they will some day get a nasty surprise from the Nips.

There are plenty of objections to be made to a sound adjustment, but it still is the only method which will work in flat country covered with rain forest. Most important of all, a lot of Japanese have been permanently laid away with sound adjustments.

FIRING IN THE JUNGLE

By Lt. Col. T. N. Dupuy, FA

THIS ARTICLE IS BASED ON TWO AND A HALF MONTHS OF COMBAT EXPERIENCE AS A LIAISON OFFICER WITH A BATTALION OF CHINESE 75-MM PACK ARTILLERY IN SURMA

Editor's note: Col. Dupuy writes, "The Chinese artillery has played an important part in the recent Chinese victories in the Hukawng valley. For two months the battalion I was with acquitted itself excellently, making numerous displacements and firing thousands of rounds in support of three infantry regiments. One battery even supported a regiment from another division for a short time.

"In the past three weeks I have used the principles outlined in this article as a basis for combat firing problems for units not yet in action. In these problems I put OPs within 120 yards of targets and chose the locations so that rounds could not possibly be visible until they were in the immediate vicinity of the target area."

Initial data for the first round fired from a newly occupied position has always been approximate. Survey has not been attempted since the limited visibility, the twisting trails, and the traffic along these defiles of supply and evacuation were considered sources of error that would render the results too inaccurate to compensate for the time and effort expended.

When they were available, air photos were found to be the best means of determining initial data. It is rarely possible to make out the exact locations of enemy positions on these photos because the thick foliage conceals them from air observation. Streams, wide trails, and paddy fields, however, show on the photos, and positions can be located approximately with respect to these terrain features. The users of air photos must realize their inherent inaccuracies and the difficulties in determining the exact scale. They must consider all data obtained from air photos of jungle terrain with a certain skepticism until target area and position area have been tied together by registration on known terrain features.

Maps of the combat area are inaccurate, but they were, nevertheless, the basis for most initial data in the battalion I was with. Originally maps of a scale of 1/126,720 were the only ones available. Later 1/63,360 maps were issued. These latter were hardly better than the half-inch maps, though their greater size made the mechanics of measuring ranges and azimuths somewhat easier. As with air photos, it was necessary to locate positions with respect to terrain features identifiable on the map and on the ground.

Pacing and frequent use of compass were necessary to get the relationship between prominent terrain features (shown on map and photo) and the positions to be located. If prominent terrain features are lacking it is sometimes necessary to obtain the respective locations of target and howitzer position solely by compass. In view of the terrain, this was little better than an educated guess.

As may be readily imagined, the inaccuracy of initial data poses quite a problem when the artillery is firing near our own infantry. Visibility is such that the only remunerative targets must be near the observer, who naturally does not stray far from the protection of his own infantry. Thus an error in range or deflection might well cause the first round to land in our own positions. Chinese infantry view this with the same chilly disapproval that is expressed by out own infantry under similar circumstances. Generous measurements and the addition of a 200-yard safety factor have always given us rounds that were surely over our own positions.

Obviously, under the circumstances encountered by us in Burma thus far, unobserved fire has been completely valueless. This is sometimes incomprehensible to infantry commanders, which again leads one to believe that the understandings between artillery and infantry are similar in all armies.

Adjustment fire has been almost completely accomplished through sensing by sound. Because of the proximity of observers to targets, creeping methods (this does not mean timid methods) must be employed. Sensing by sound is obviously not so accurate as by eye, therefore initial adjustment should be by one gun in order to save ammunition. Forward observation methods are used.

The first problem of the observer is to locate the direction of the pieces with respect to his own position or, in other words, establish the gun-target line. There are three aids in doing this. The howitzer position telephone operator must report *On the way*, alerting the observer to listen for the sound of the piece being fired. This sound is often obscured

Behind the Chinese advancing in the Hukawng Valley, a bulldozer widens and smooths the narrow road. The wrecked trucks were abandoned by refugees fleeing from Burma in 1942, and since have been stripped by the Japs and riddled during battle. Impenetrability of the country is well illustrated by the dense bamboo and hardwood growth which extends to the very road-edge.

by the noise of battle around him, but the whistle of a shell overhead will usually be audible over normal, desultory rifle fire, so this whistle becomes the second aid in determining direction. The third means is to make a bold range change and establish the line by comparing the location of successive bursts.

Thus, after the first round bursts, the determination of range is coupled with the determination of direction. As we have seen, the first sensing is made for range only, without change in deflection, unless there is good reason for a deflection sensing. Changes of one element at a time have been most successful in the early part of the adjustment.

After practice the observer will be able to tell from a high-pitched whistle and a closely following burst that small changes are necessary. He must be on the lookout for smoke and falling branches to give him the exact location of the bursts. Smoke shell has been of some assistance, though it has less value in locating lost rounds in the jungle than in other types of terrain. Firing a battery volley will sometimes provide an observable round when the observer knows he is close but is doubtful as to exactly where or how close. Rounds less than 50 yards away are often never seen. The observer, therefore, must listen for the sound of fragments. Knowing the enemy position is only 50 or 100 yards away, hearing the burst in the direction of that position, and seeing or hearing occasional fragments in his own vicinity, the observer can be certain that he is getting effect. Under such circumstances, however, it would be dangerous to bring in another battery through FDC without adjusting that battery separately.

The artillery preparation prior to an attack is much the same in the jungle as in other types of terrain. Prior to the attack there must be a conference between infantry and artillery commanders. A time schedule must be prepared. Without time schedules, or when schedules have not been adhered to, infantry-artillery cooperation has been unsatisfactory.

Effective surprise fire is not possible. Registration must be made on at least one point in the enemy forward line and, if possible, at several points. If an envelopment is to be made, we must register on the limits of his position closest to the enveloping force or forces. Because of the limited visibility this usually means that each battery must have two or even three observers in order to accomplish the registration and to render proper support after the attack has begun. This may involve difficulties with wire. T-splices and party lines will make limited wire serve several OPs.

Preparations should be short but intense. The enemy races for cover when the preparation begins. He burrows so deeply that after the first few rounds casualties are negligible. At the instant scheduled for the infantry jump-off the fire must lift, preferably being continued at the same rate for a short time a few hundred yards beyond the immediate objective. Short concentrations prior to the actual preparation confuse the enemy and cause him to stay in his hole after the fire lifts. The observer will find that the massed fire of the preparation will improve his observation if further firing is necessary.

Much has been made of "limited visibility" in this article. Like other artillerymen I had read of the denseness of jungle foliage, but it took a battery volley landing 30 to 60 yards away but completely unobservable, to really show me what "limited visibility" in the jungle is like.

SOUND OBSERVATION IN THE JUNGLE

By Lt. Ivers L. Funk, FA

To begin with, I wish to explain I have no intention of creating an illusion that I'm an authority on sound observation. It is merely my desire to pass on to those who are interested a few facts I've learned from actual combat in New Georgia. The National Guard outfit with which I was mustered into service on October 15th, 1940, was composed of a lot of officers who were senior to me and who hadn't been to the School. Of course they were sent first, and before my turn came Japan attacked Pearl Harbor and we were alerted to go overseas. That cancelled our quotas immediately.

I've always had a great desire to take the course, and firmly believe the principles taught there are the best in any Army, but our recent replacement officers mention the fact that they weren't prepared in any special way for sound observation. Actually, though, the art of jungle artillery observation would be a difficult subject to teach for several reasons. For instance, almost any soldier can orient himself on a map or map substitute on ordinary terrain—but jungle terrain isn't ordinary.

If you're given the usual photomap of an area that comprises the remarkable saneness of jungle, with perhaps a shore line showing a few points and islands offshore, it's easy to see that as soon as one leaves the shoreline and goes into the jungle he is out of orientation. The farther he goes the more doubtful it becomes. These are the things that begin to make the forward observers' and liaison officers' jobs tougher in the jungle. The infantry does its best to keep in general orientation but it is we, the artillery, on whom the task falls of placing *accurate* and *safe* artillery fire in direct support of their mission. We can seldom find an OP where it is possible to see more than 50 yards in any direction. To climb a tall tree means only to see more jungle, for there are tops in all the other tall trees.

Observers on Guadalcanal had this same condition, but they also had some open grassy knolls and ridges where they were able to get some observation. I've been over both battlegrounds and can say that the terrain in New Georgia was much tougher. Any hills or ridges we found there were as thick as the swamps. Many places the trees towered 100 feet above the jungle undergrowth. So try to visualize yourself sitting in the middle of this and trying to figure out how to place fire on an area 300 yards from where you sit and on a given azimuth from there. That's what the infantry CO will ask you to do.

If you were on the ball as you advanced—made use of your compass once in a while and paced or estimated distances as you came—you may have a rough idea of where you are. If you're lucky it's within 1,000 yards, more or less depending on how accurate were your IP and estimate of the distance travelled. It is hard to imagine how difficult direction and distance are to maintain in this mass of jungle growth! Sometimes after tearing and twisting your blind way for 25 yards through vines, wait-a-minute bushes, high roots, etc., you'll swear you've gone 100 yards and when you check your compass it seems to be a long way off from your sense of direction. It is tough—I know.

So the best you can do is estimate your position the best you can and add a large safety factor. It is well to ask for the initial round in a place which you are fairly certain is in enemy territory. Better ask for smoke the first round: not that you're likely to see it, but if it falls close to our troops they are less likely to be injured. One of our forward observers with his party and several infantrymen would be out of the war for good if he hadn't followed this rule. His first round landed less than 10 yards from several men, and the only damage was a slight burn on the face of his telephone operator. When you get *On the way*, always insist on absolute quiet around your position.

Loading for high angle fire on Bougainville

People have a way of congregating around an observer during an adjustment, and they find it hard to keep quiet.

You can get a lot of information from each sound you hear as pertains to your round or salvo. In fact, that's the only way you'll get any dope, so use all of it. Listen to the battery firing—that tends to give you their relationship to your position. Usually you can hear the round overhead if it passes within 1,000 yards of your position. Then when the burst comes you have an idea of the GT line. You know the round passed either to your right, left, or directly overhead. With experience you can tell approximately how far right or left. In case you heard the round go over but didn't hear it burst, it is best to change to HE, Fuze Quick, unless you think it may be too close by its sound as it passed. Smoke isn't nearly so loud as HE. Now that you know the round is in front of you, smoke is of no further use. Delay fuze causes more duds, so fuze quick is better for registration. I've yet to get a positive dud from a fuze quick.

If you still don't hear the round, move it in the same way you would any lost round—only be more careful. I'd never make a sound sensing of more than 200 yards even if it sounds a mile away. Sound is very deceptive and no two bursts fired at the same elevation sound exactly alike. I make it a rule to repeat range with HE when changing from smoke because of the difference in sound. Whenever there is any doubt, repeat range. Let the S-3 worry about ammunition supply, and never let him talk you into a sensing against your judgment. You're on the spot and can hear better than he. Ammunition is cheaper than soldiers.

While acting as Liaison Officer on Baanga Island, New Georgia, my forward observer (Lt. Charles R. Martin) made a sensing of *200 over* on a round that sounded at least 600 over. The artillery liaison officer with the infantry battalion on our left was with me, his forward observer was about 100 yards to Lt. Martin's left, and neither forward observer was more than 100 yards from my position. We were using a sort of bilateral sound observation which helps at times. All four of us concurred on the sensing; however, the subsequent round burst at a shorter range than our perimeter and, fortunately, to its right edge by 100 yards. This might have been caused by errors at FDC or at the battery, but more likely was caused by dispersion and/or false sound. That taught all four of us that 100 yards is the largest range or deflection bound one should ever make when working close in toward friendly troops. Your estimation isn't always perfect when you can see, and sound is even more unreliable.

The difficulties of observation are tremendous under such circumstances, but every infantryman I've talked to who participated agreed that we might still be fighting the Jap at Munda if we hadn't had artillery. A lot of ammunition was ineffective, but you couldn't call it wasted, for most of it had devastating effect. It not only harassed, demoralized, and neutralized them many times, but it also killed a lot of Japs.

I feel I can safely say that 90% of the direct support missions were observed only by sound. There is usually at least one exception to the rule, so I had one of the few good OPs in the whole operation. In the closing days of Munda proper I was on the nose of a small hill north of Munda Strip and could see all the way to the ocean in a westerly direction. Directly in front of me on the slope of the nose was the crater

of a 500-pound bomb, and it had cleared away enough foliage to give me good visibility on the flat coastal plain—which was relatively sparsely covered with jungle, with few big trees for about 1,000 yards. Our advance had been halted the previous day and we put down a protective fire which enabled our troops to drop back for the night on higher ground.

Our advance started at 0800, following a 20-minute preparation adjustment as close as possible to our lines and moving out as our infantry advanced. The advance had hardly started when they started to receive direct fire from Jap 75-mm dual-purpose AA guns. From my position I could see flashes from three or four of them, although their positions were virtually impossible to locate even while they were firing. We shifted our fire to them and the infantry mortars also were brought to bear on them. Later we found there had been eight guns in a 300-yard area. They were soon neutralized, although our troops got so close we had to stop our artillery before the last one ceased to fire.

These tricky Nips once stopped our fire over here by firing into our rear areas at the same time we were firing. I knew none of our fire had fallen short, for I could see every volley, but it took some convincing to get going again. One observer joked that one Jap 90-mm mortar fired at the right place and time could neutralize a whole Division Artillery. The liaison officer's job in such cases is to use his head and be intelligent enough to recognize such a ruse. An artillery officer constantly at the side of each infantry commander would be helpful. With a little experience and common sense anyone can tell the direction from which a shell came and what kind of a weapon fired it. All commanders would do well to make sure before they cry "wolf" and so stop vitally needed artillery fire.

Remember that in sound adjustment it is always better to exercise the utmost caution. Above all, keep in mind the dispersion factor and the unreliability of what you hear, based on only one round. Use every possible bit of data the sound gives you. Before you start the adjustment, pick out some prominent object in the direction you desire your fire to fall. As the round passes over and when it bursts, be sure you are looking directly at the chosen object; in this manner you can easily tell if direction is about correct. Never adjust more than one element at a time and try to keep on your sound O-T line by alternating changes if necessary. Always change to salvo fire and the type of projectile you will use for effect before you get too close. Your adjusting piece might be firing over the other three guns.

We found intermittent volleys on a jumbled schedule effective in keeping enemy night patrols from infiltrating. These protective fires were placed in the most likely avenues of approach of an enemy counterattack during the night. Usually not more than two were needed for a battalion perimeter, many times only one as battalion sectors are narrow in such terrain. From these concentrations we could quickly start a preparation for an early attack in the morning.

A word about communications. We habitually put in combat wire (W130) as we advanced, and the battalion wire party replaced it the next day (if possible) with W110 field wire. Combat wire doesn't last long over trampled jungle trails, especially as bulldozers are usually making peep trails as soon as possible. The answer is to replace combat wire as soon as you can, laying it well off the trail and tying it up into trees six or seven feet. We had excellent results with 600-series radios, primarily because of previous experience with and study of its possibilities. We used special antennae on base sets and were hardly ever out of voice radio communication. No piece of electrical equipment will give satisfactory results if it is wet, however. Without your communications you would be better off at home, so take special care of radios, phones, headsets, mikes, handsets, and spare batteries. Cover them with your own raincoat if necessary. You can function when thoroughly soaked but your communications equipment can't. It is a good idea to remove the bell from your phone before you start—it will still buzz like the old EE5 and attracts less attention.

High angle fire may be used to good advantage when in tall jungle and there is danger of shorts caused by the angle of fall at some ranges. Dispersion isn't much greater from this kind of trajectory. Fire direction personnel should be carefully trained in this type of fire. It must be remembered that high angle fire, especially with the heavier charges, places a terrific strain on the trails, spades, and carriage. We had to send several howitzers to ordnance to have the trails welded. Our howitzers were among the first ones manufactured, however, and these weak spots have been adequately reinforced in later carriages.

An empty projectile with rotating band and bourrelet filed off, and a handle welded to the fuze end, makes a good tool for helping to straighten bent shell cases. We found it a "must," as some ammunition doesn't arrive in perfect condition.

STOP-WATCH LOCATION OF HOSTILE BATTERIES AND ADJUSTMENT OF FIRE

By Maj. B. H. McCurdy, FA

Determination of ranges by timing sound is not a new idea. It has been used in this war by the Marines, but from further study and test this method has been improved so that it is possible for a single observer with a stop-watch to locate enemy batteries and to adjust our own artillery on these hostile batteries at night. One main difficulty in accomplishing this was the fact that it was not possible to pick out one battery when several were firing at the same time, as is usually the case. This problem has now been solved.

To determine the location of hostile batteries by sound we must know the distance and direction to that sound source. Direction was determined by ear and by the gun flash. Directions obtained by ear were found to be not sufficiently accurate for our purposes. Very accurate results were obtained by laying an observing instrument on the flash made by the hostile battery or on the glow on the horizon produced when the battery was defiladed. Range was determined by multiplying the time interval between the flash and the bang (sound) of the enemy gun, with the speed of sound.

Theoretically, that is all there is to do to locate an enemy battery. Practically, we must overcome four more problems.

1. *Distinguishing between "ballistic" sound and "muzzle" sound.*—Whenever a gun fires with a muzzle velocity greater than the speed of sound, the two sounds mentioned are present. The ballistic sound or wave is produced by the projectile as it passes through the air. This sound is a sharp crack, originates along the trajectory, and is heard before the muzzle sound.

The muzzle sound or wave is produced by the powder explosion as the gases leave the muzzle. This sound is a dull roar and sometimes is very difficult to hear, but this is the sound that must be used. With a little experience this differentiation is not difficult.

2. *Determining the proper sound corresponding to a certain observed flash when there is other firing from the same area*.—When several guns are firing it is necessary that the time interval between "flash" and "bang" be for a single battery.

A flash was selected and the proper time interval for the bang resulting from the same source as the flash was determined as follows:

a. The stop-watch was started as soon as the flash was observed, and the times were recorded for each sound heard for a reasonable period thereafter. This was repeated several times.

b. From the series of figures obtained, a predominant time reading will appear. For example:

1st	*2nd*	*3d*	*4th*
1.4	2.4	.8	1.6
2.6	3.6	2.0	2.8
3.0	4.0	3.4	3.0
4.2	7.6	4.2	4.2
8.4	9.6	8.0	7.0
9.8	12.8	9.2	9.4
12.4		10.0	11.6

The predominant time is 4.2 sec., and as it occurs each time, it is the proper time interval for the battery whose flash is being observed. This should be checked by starting the watch when flash is observed and stopping it when sound is heard (at approximately 4.2 sec). The interval is usually different when the watch is read (instead of being stopped when the sound is heard).

3. *Weather Corrections*.—

If the *temperature* varies greatly from 50°F, a correction should be applied. The velocity of sound is 351 yds/sec at 0°F and increases approximately 3.7 yds/sec for each 10°F increase in temperature. The speed of sound at 50°F is 369 yds/sec.

Unless the *wind* is blowing toward the observer no corrections need be applied, because a cross-wind or a wind blowing away from the observer of sufficient velocity to warrant a correction, usually makes it impossible to hear the sound of the enemy battery. The velocity of sound is increased 0.5 yds/sec for each mile per hour of range wind, blowing toward the observer.

4. *Errors*.—Several undetermined errors were known to exist, and after repeated tests (using different personnel, different OPs, and different battery locations) it was found that the computed locations always averaged about 100 yards short of the true locations. A constant correction of 100 yards was added to all ranges determined and the average range error resulting from all tests was 7 yards.

For intelligence purposes only, the weather corrections and the constant correction need not be applied. For accurate locations, however, as well as for counterbattery, they must be applied.

As previously stated, fire can be adjusted on enemy batteries using the "flash"-to-"bang" principles. This is preferable to locating the enemy battery and then firing by normal methods, since no corrections need be determined and all errors cancel out. This is because the fire is adjusted by the same method as was used to locate the target. The observer orients his instrument on the "flash" and times the interval between "flash" and "bang" (muzzle sound) of the enemy battery just as was done before. This gives him direction and approximate range. The observer then fires a high burst, places it on the OT line by using his instrument, and brackets the *time interval* between the "flash" and "bang" of *his* bursts until it coincides with the time to the enemy battery. When the target is in a defiladed position and only a glow is observed above the crest, the observer should place the horizontal hair of his instrument on the crest line and adjust his fire to that point. Estimating how far below the crest the target is located, based on the shape and intensity of the glow, he should then go into fire for effect with the proper height of burst. When the target is not defiladed, the horizontal cross hair should be placed on the center of the flash, and fire for effect initiated with the proper height of burst.

Example:

Time interval "flash" (glow behind crest) to "bang" for enemy battery = 18.0 sec.
Target estimated 40 yds below crest.
Approx. range = 18.0 × 370 = 6650 yds.
r/R = 1, guns about 1200 yards to left.
s = 5.
BA, Sh, HE, Ch 7, Fz Rn 6600, Ca 1500, Si 320, S①, Rn 6600.

Comds.		*Time Int.*	*Sensings*	*Remarks*
	6600	17.4	G ? 30R	Graze
L30, U10	6600	17.6	A—	
L20	7000	19.0	A+	Air, 5[illegible] above crest
R10, D5	6800	18.4	A+	Zero height of burst
L5, D3 B①	6700	18.2	RC	at crest
	6600			
	6800			

Several problems of this nature were fired at night, using high bursts from friendly artillery to simulate enemy batteries. These bursts were then adjusted on the simulated target by the above method and the adjusted data compared to the data used to fire the high burst originally. The results of this firing were sufficiently accurate for counterbattery fire (within 70 yds, corresponding to the smallest reading of the stopwatch).

Another valuable use for "flash-bang" which was used successfully is the determination of ranges to points in the target area from an OP or by a forward observer, by timing bursts which are landing in the target area. The location of the BP can be determined initially, then other ranges from any burst that might be seen regardless of its source. This gives very good initial data for adjustments by either forward observer methods or normal observed fire methods. By determining the range to the BP (using rounds fired in adjustment) and measuring the azimuth, the location of the OP can be determined.

With a little training these methods, if properly used, will pay dividends many times when no other means are available for this type of mission. All that is required is an observer with an azimuth instrument and a stop-watch, although a recorder is a great help.

RECENT FILM BULLETINS

101—Tournapull
102—The Engineer Dozer
106—Airborne Troop Carrier Maneuvers
109—Training Weapons for the 4.2-Inch Chemical Mortar

Modifications to the "Third" Wheel

By Capt. William Gray, FA

In order to overcome some of the difficulties of jockeying a 105-mm howitzer around over jungle trails under jungle conditions of sand, mud, and rough terrain, it was thought that a "third" wheel giving the 105 the outward appearance of a trailer (pivoting the gun in the same manner) would be of value. With this in mind, we have modified our original attempts (for which see page 294 of this JOURNAL for April, 1943) in this direction, to simplify and improve its workability.

An ordinary trailer wheel pivot assembly was removed from some salvaged trailers and the assembly cut off about 1″ above the lower pivot swivel. Welded to the center of the lower pivot swivel is a ⅝″ bolt, 2½″ long. A piece of sheet iron, roughly 7″ in diameter and circular in shape so as to cover the under side of the lunette ring when in the traveling position, is welded to the outside of the pivot swivel in the form of a large cuff. A piece of 2¼″-long pipe, the diameter of which is approximately the same as the inner diameter of the lunette, is welded onto the lower pivot swivel and serves as a shaft. This completes the base of the assembly.

A lid or cover (to clamp down on the upper side of the lunette) was fashioned out of another piece of pipe 2″ long, ⅜″ thick, and of 4⅜″ inner diameter. A circular piece of sheet iron, serving as a cuff, was welded around the lower edge of this pipe. The upper end of the pipe was closed by welding a second piece of sheet iron, with a hole in its center to permit the passage of the bolt. A nut, with small arms welded to it to facilitate tightening the assembly in place and to do away with having to use an adjustable monkey wrench, was added.

The job was completed by attaching a balloon tire, acquired from a salvaged bomb trailer, to the fork of the lower pivot assembly (see Fig. 1). Inflation of this tire to about 25 lbs. pressure proved adequate to keep the weight of the trails from sinking the wheel into the ground. This "third" wheel is inverted in the air when the trails are spread in the firing position, and if it is desired to move the gun by prime mover the wheel assembly can be quickly removed and placed in the truck.

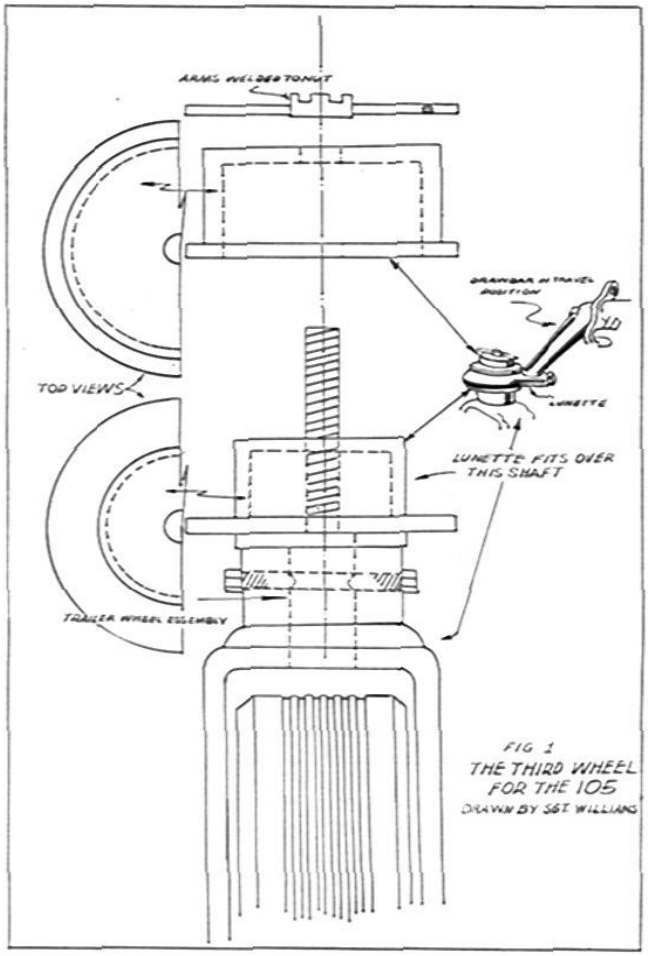


FIG. 1
THE THIRD WHEEL FOR THE 105
DRAWN BY SGT WILLIAMS

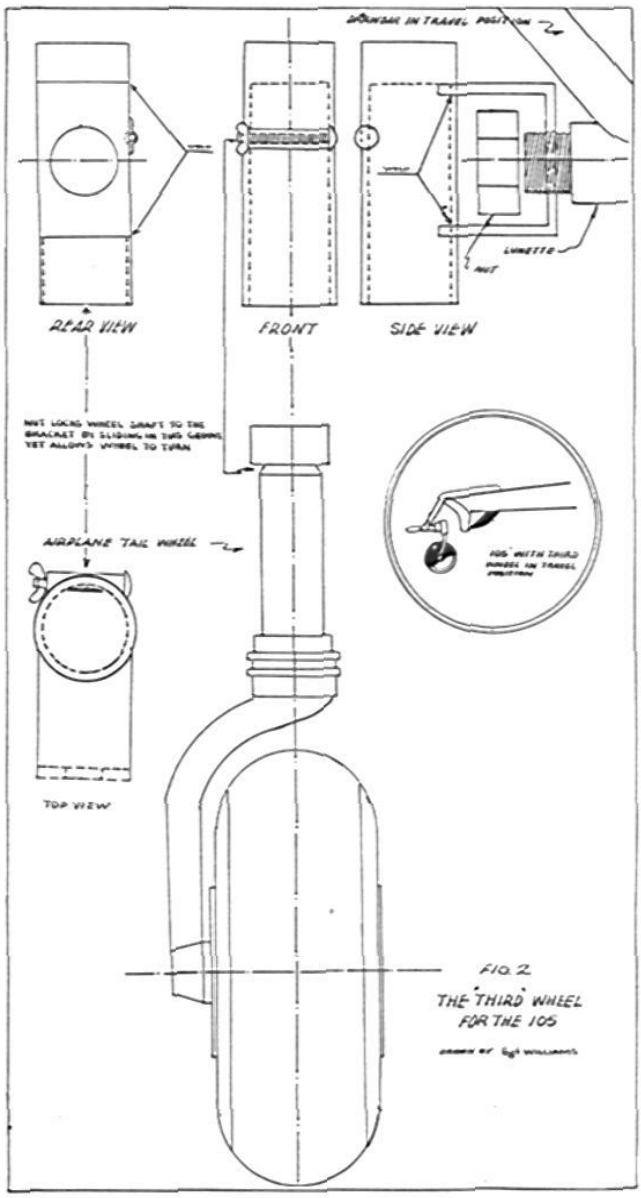


FIG. 2
THE "THIRD" WHEEL FOR THE 105

The Marines have evolved a different theory working on roughly the same principle. They obtained a tail wheel off of a salvaged Vought Corsair and cut off the support at the head of the fork. Then they welded a piece of 5″-length pipe, 1½″ in diameter, to the fork, and grooved the pipe about 1⅜″ from the top so that a locking nut could engage the groove and lock this pipe (which serves as a shaft) into another piece of pipe 1 9/16″ in diameter which receives the shaft pipe. A small rounded piece of metal was then welded onto this outer bracket pipe 1⅜″ from the top and a place drilled for the locking nut. This nut locks the wheel shaft pipe to the outer bracket pipe by sliding into the groove cut into the shaft, yet allows the wheel to turn (see Fig. 2). A U-shaped piece of sheet iron, the ends of the U being 3″ apart, is welded to the bracket pipe about 2″ from the top. The width of this U-shaped iron sheeting is approximately 2⅜″, and there is a hole cut in it to fit the diameter of the bolt which attaches the lunette to the draw bar (see top and rear views, Fig. 2). This device allows the third wheel to remain attached to the gun whether the trails are in the firing position or latched together and the gun coupled to a prime mover. This device may prove more feasible. Its main drawback seems to be that the wheel surface is not wide enough to keep the wheel assembly from sinking into the sand, and the shaft itself seems too short to raise the latched trail spades adequately.

Artillery Security in the Jungle

By Maj. Su Sing, Chinese Artillery and Lt. Col. T. N. Dupuy, FA

Author's note: The principles of security described in this article have been used by Major Su's battalion (75-mm, pack) in combat in Burma. As liaison officer with his battalion I have had frequent opportunities to observe the principles, and some violations of the principles, in practice. Violations have been costly.

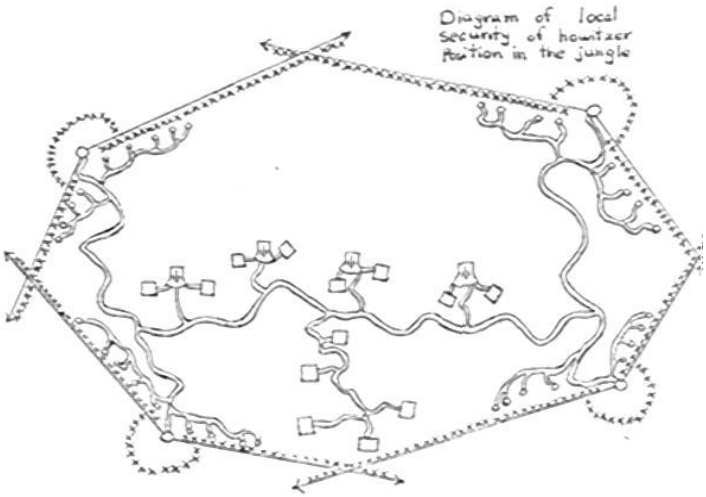
Location of suitable positions is probably the most formidable problem confronting the artillery commander in the jungle. The denseness of the foliage limits him to the trails in reconnaissance. This same denseness and the height of the trees restrict range and direction in even the best positions. Furthermore, positions which are logical for him to occupy to accomplish his mission are logically the recipients of attention from enemy artillery and from enemy infantry patrols.

Trails are favorite targets for Jap artillery. Jap counterbattery has been very ineffective save when they have searched for positions along these trails in territory they have previously occupied. Such locations have also been visited by Jap patrols. Positions therefore should be located as far away from prominent trails as possible.

The same is true, to a lesser extent, of large paddy fields and clearings which appear on the maps. Often it is necessary to occupy such clearings in order to accomplish the mission. In that case choose the largest possible field, if there is a choice, and put the position several hundred yards from any trail, if possible.

The most successful positions have been cut out of the jungle on high banks overlooking small streams, at least 500 yards from prominent trails. If these streams do not appear on the map, so much the better. In order that the general jungled appearance of the location be unchanged from air or ground observation, cutting of trees is kept to a minimum. In most cases a minimum elevation of 350 mils is satisfactory and targets can be attacked at ranges varying from 3,000 to 8,000 yards.

Concealment is quite effectively provided by the jungle if personnel are careful to observe the proper precautions. There is no tree cutting other than that absolutely necessary to clear a field of fire and to provide cover. Light and fire discipline must be maintained. Drying clothing must not be prominently displayed.



Local security has followed, insofar as terrain would allow, the principles shown on the accompanying sketch. As will be noticed, the defense has been built around automatic weapons.

Light machine guns are so arranged as to provide interlocking bands of fire completely around the position. Each machine gun is dug in, and embrasures provide two firing directions; a narrow lane is cut for a field of fire for each of these directions. Lanes of neighboring machine guns intersect and should be continued slightly beyond the intersections. Whenever possible these lanes are made to simulate animal trails, of which there are many in the jungle. On the inner side of these lanes there should be obstacles. The most satisfactory obstacle is impenetrable jungle undergrowth, real or simulated. Even such obvious obstacles as abattis, panji stakes, bamboo fences, tin cans strung on wire or vines—even booby traps—will do. The main purpose of these obstacles is to discourage Jap patrols from pushing through (and thus disclosing their presence) and to encourage them to reconnoiter along the narrow trail covered by the machine gun. There are also obstacles in an arc around the exposed side of the machine gun to prevent the undetected approach of an enemy to within grenade-throwing range; 20 or 30 yards are sufficient, in ordinary jungle, to prevent such unannounced grenade tossing.

There must always be one man on the alert at each machine gun.

Paths, which become trenches when the position is occupied for a considerable length of time, link the various parts of the position. Foxholes for riflemen are scattered around the vicinity of the machine guns. The occupants of these foxholes are primarily for lookout, for protecting the dead spaces of the machine guns, and for covering obstacles around the position. In daytime one man should be on the alert in the vicinity of each machine gun. At night there must be at least one man on the alert on each side of each machine gun.

Because of the known propensity of the Jap to use strong patrols as his major counterbattery means, some support should be given the battery in the defense of the position. A platoon of engineers or infantry has been found most helpful. This provides more automatic weapons, help in clearing fields of fire and constructing cover, and riflemen—so necessary in the protection of the position, yet so scarce under existing T/Os.

When there is time and the situation demands it, the pieces should be dug in. The emplacement should be as deep as possible without interfering with the maximum elevation. It should be as narrow as possible for maximum protection, being only wide enough so that the piece can be traversed to cover its entire assigned zone of fire. Overhead cover, the last thing to be considered in an emplacement, has two advantages. In the jungle there are many tree bursts, which have an effect similar to time fire on personnel beneath the trees. The other advantage is one of morale. When shells are falling nearby, men are comforted by even the scantiest shelter overhead. But it must not interfere with the maximum elevation of the piece, and it must not interfere with the traverse of the piece.

When a position is to be occupied for any time at all, and personnel and time are available, covered foxholes or dugouts should be provided for all personnel. Log-covered pits have been found quite satisfactory as sleeping quarters and cover for personnel, and for storage of ammunition.

Security of animal parks is next in importance to the security of the howitzer position. The park should be at least 500 yards from the howitzer position, and similarly it should be as far from the main trails as possible. It should be near water for convenience in obtaining water for both horses and kitchens, which should also be located in these parks.

If the park can be located near infantry installations the problem of security is simplified. All automatic weapons not needed at the howitzer position should be made available for the defense of the park. Again interlocking fields of fire for automatic weapons, and all around defense, are desirable. If there are any gullies, particularly gullies perpendicular to the direction of fire of enemy artillery, the animals should be placed therein. The dead space on the side of the gully closest to the enemy is the most appropriate place to keep the animals.

The principles contained in the manual, *Far Eastern Warfare Combat Methods* [printed, I believe, in CBI Theater], should be followed for security on the march. This text should be required reading for all officers and non-coms operating in jungle terrain.

THE MIGHTY JEEP

We think of the 105 as needing a 2½-ton truck as prime mover. So it does, as a rule, but circumstances do alter cases. An incident on the sands of Sicily during that island's invasion points up this fact. Told by a staff correspondent of *Yank* and Corporal I——, the gunner, this account is republished by courtesy of Willys-Overland Motors, Inc., to whom go the thanks of us all for making available the graphic illustration of the scene which accompanies this issue. But for the story itself—

"The crew of Ten-O-Eight certainly loved their gun. They had teamed up with it through all their months of Army Ground Forces training, from Texas to New York. Then, at last, one thrill-packed day, the boys found themselves and the rest of their battery aboard a transport headed for Sicily.

"Long will they remember the wild morning they landed amidst the smoke and noise of bursting German bombs and shells. It was their baptism of fire.

"The gun crew were disembarked first. But the gun couldn't be put ashore there. So Corporal I——, the gunner, was ordered to go with the landing boat to a point about ten miles down shore where the gun could be landed. A little while later the Corporal found himself on the blazing beach with the gun, no ammunition, and with no means of transporting the gun.

"By that time all hell had broken loose. Nazi shore batteries, bombers and strafers were literally spraying the beach with death-dealing missiles of every description. Young Corporal I—— was in a tough spot. But here is what he did—as told in his own words:

"'My job was to get the GUN back to our battery, and quick. But how? Things kept getting hotter every second. I had just about made up my mind to duck under the gun and wait for help, when I saw a Jeep coming my way. My only chance was to beg, borrow or steal that Jeep. So I yelled, "Hey, Yank! Can that baby pull this gun? We got a date up ahead with our battery!" "Sure," he says. "She'll pull anything that ain't set in concrete. Just tie on to her."

"'So a couple of sailors and infantrymen helped me hitch the gun to the Jeep, and the drive began to ease the power into the Jeep's four wheels. Believe me I was praying hard. I had *all* my fingers crossed. Why? Because that Jeep was pinch hitting for a big brute of a 2½-*ton six-wheel drive truck*—the kind that always tows 105-mm howitzers. It was a "field expedient," as they say—not a Jeep's regular job at all.

"'But it *worked*. With some help in the heavy going, that fighting Jeep pulled the gun all those ten miles—*through sand*—right up to a high spot where our battery was in action. And in a few minutes old Ten-O-Eight was shooting *for keeps*, for the first time in her life—and in ours.

"'I had often heard that Jeep fighting cars packed a load of power. Now I *know* it. That Jeep baby sure pulled *me* out of a hole that day, and I mean pulled!'"

DECEPTION

By Cpl. Walter S. Goff, FA

Editor's note: Our Corps of Engineers has labored long, hard, and well in preparing excellent camouflage manuals with the cooperation of the using arms. These should not be passed by as being "just some more manuals I'll look at some time—maybe." Cpl. Goff has been through the mill "down under," and his comments on this subject squarely agree with the manuals. May his remarks stimulate greater interest in the art of concealment and deception.

Sun Tzu once said, "The art of deception is all-important in the art of war. To make the enemy think you are great when you are small, to make him believe you are near when you are far away, is to panic him; to make him believe you are small when you are great, to make him think you are far away when you are near, is to lull him to false security." The great Chinese general enlarges when he gives methods, examples of which are false agents, spies, and (most important to us) concealment of baggage and men.

The Art of War was written about 500 B.C. Although their applications have changed, the fundamentals of war have not. We must still deceive the enemy in order to survive, in order to attack "the fustest with the mostest." To show these applications, let us look at methods by which the artillery deceives the enemy.

Artillery is no longer "behind the lines." The front now extends many miles in length and depth, leaving numerous gaps which enable even mechanized battalions to infiltrate. Against them the field artillery has fair, active defense. However, our antitank weapons may not always be enough, the carbines of our battery not sufficient to cope with the armed might of an infantry battalion. Remember, the enemy cannot shoot what he cannot see. Therefore, don't betray yourself, even if it means lying in a cesspool of the Solomons and listening to screams and whimperings without answering back. It takes self-discipline and high morale to do this, I know.

Artillery is particularly vulnerable to aerial bombardment. Against this, especially planes at altitudes higher than 500 feet, we have very little defense. Our small arms help some, but not much.

Our third vulnerability is from counterbattery. If the enemy once ranges us we are dead ducks unless we can move to an alternate position without being observed. Needless to say we are most vulnerable when we are easily seen, going into or out of position.

It is apparent then that the best way to avoid attack is to stay out of sight of the enemy; conceal not only your howitzer or vehicle and its tracks, but the slightest latrine path. After the first bullet passes your way, if it is not too late, you'll know to do the same with yourself. If your efforts here at home are half-hearted your efforts there will be half-effective, which will be worse than none at all. Remember, camouflage can't be "pretty good"—it must be perfect.

Enemy observation of our installations falls into two categories: ground and air. Ground observation takes its form in observation by direct means from OPs whose vision is very limited and should not bother us particularly if we have a normal amount of defilade from reconnaissance patrols who may be dealt with by the local security detail. This is a *must* in battle. Don't rely on the infantry for security, for they have their hands full elsewhere most of the time. Security is your job. While to be defeated may be excusable, to be surprised never is.

Observation by the sound and flash batteries is another story. Concealment is obviously the only means of obtaining flash defilade, and this is the responsibility of the executive. Sound ranging is not very effective, but let a flash detail see only two rounds and you will have Division Artillery on your neck. Watch your defilade and report anything wrong. It will be your personal neck too, you know.

Of the two means of observation, air is the more important and the harder to conceal against. Direct observation is less important from the air, but with the aerial camera nothing is missed.

Aerial photographers use cameras with interchangeable lenses. Normally a 12″ lens is used, making a picture of the same scale we have all seen. If an area looks suspicious, however, a 24″ lens will be used so that if flying at 30,000 feet it is possible to take a picture of an object two feet in diameter on the ground. By using infra-red film artificial camouflage (garnished netting) can be detected, as it photographs black. Since the enemy will use such special and expensive equipment only on suspected locales, don't let him suspect you.

As a word of warning, aerial photographs are taken from two angles, vertical and oblique. Watch your nets: if they are too high the camera eye will see under them. The enemy employs experts whose sole duty is to read aerial photographs and find your position. These officers follow a pattern in looking for a position.

First comes form. They look for straight lines, such as a truck body. Only man makes straight lines; observe nature: she never does. Watch your nets—thick at the center, thinning out at the edges, breaking up the form. To cover a gun and forget its shadow spells doom since the shadow of a man-made object forms a line, too. Remember, a 9 o'clock shadow will be in the opposite direction at 3.

Texture and color catch the eye of the enemy next, smooth textures appearing light while rough textures are dark. Common sense tells you to use the same color as the surrounding territory when camouflaging a position. It would deceive no one if you made a portion of the Solomon Island jungle look like a coral beach. For positions that will be occupied for a short while only, cut small trees and stand them upright to break up the form and shadow, using a staggered formation for better results. However, remember to stick them in the ground in the same position in which they grew, as the under side of leaves photographs differently than the top. When gathering these materials be sure to take them from widely scattered areas as far from your position as possible.

Fox holes and slit trenches must always be dug. Put the dirt on a shelter half, take it away from the position, and scatter it as you would throw rice at a wedding. Never dump it all in one spot. If you are to occupy a position for a long time it would be still better to sod this dirt.

Throughout their inspection enemy observers look continually for changes from previous photographs. Don't make new paths and roads—they will betray you every time. Stick to natural cover if new latrine paths have to be made; should this be impossible, string garnished neeting. Always rope off all paths. It may be tough to stick to these paths; it's doubly tough at night, but dying is a lot tougher. In the Solomons our camp was a maze of wires; we maintained camouflage discipline and the Japs never purposely bombed our areas. Others who weren't so careful as we weren't so lucky.

Camouflage itself is artificial. Use either cut branches stuck in the ground or the article itself for temporary positions, or netting for longer installations. Remember, when using limbs new ones must be emplaced every four hours or (and this is very important) the color will change and photograph differently.

The most important single thing to remember is that natural cover is best. If you have it, use it, because camouflage is only a substitute for natural cover. You may disguise a gun to look like a house. Good! You may build dummy positions, you may blend by disruptive paintings or by drape or flat top netting, *but they are only substitutes* for natural cover. If natural cover is adequate, it is impossible to detect.

But first you camouflage, then you work under it. You cannoneers remember, when camouflaging: look nature over first, see how she aids you to break up *form, shadow, texture, and color*, then don't go back on her. Don't make new roads, and if you must mar the landscape, hide your work from prying eyes of the enemy. Deceive him, make him think you are far away. We did and lived!

TUNNEL GUNS

In Sicily the Germans used 17-cm guns on railway carriages, which were pulled back into tunnels between rounds (see page 849 of this JOURNAL for November, 1943). Against our Anzio beachhead they seem to have used similar tactics, keeping the guns at a range of over 30,000 yards.

HIGH ANGLE WITH WIDE FIELD—ADDENDA

Lt. Scott A. McKinnon, FA, writes further concerning the field expedient developed by him and his men with the 37th Div Arty:

"Our unit first saw action in the New Georgia Campaign. In that action low angle fire was used almost exclusively, and then too we were in direct support so large shifts were not called for. Not until our present assignments [on Bougainville] did the problem of high angle fire with a 6400-mil field of fire occur.

"As a further development in the expedients described [on pages 304 and 305 of this JOURNAL for May, 1944], we have found that after a prolonged session of firing the howitzer is driven backward a certain amount and that with the blocks wired to the wheels it is difficult to recenter the piece in the gun pit. To offset this difficulty we have spliced a rope net, identical in construction with a tire chain, which is placed over the wheel like a tire chain and attached to the ends of the wheel blocks. This permits the piece to be rolled the full length of the blocks, (if necessary), centered over the jack, and lifted, and the blocks then readjusted. Otherwise the aids are operating smoothly and efficiently.

"I would point out another field expedient shown at the extreme left center of the left photo on page 305 of the April JOURNAL. Just outside the trail pit is a shell case, driven into the ground and bearing the number '641'. That is the number of a base point. When the battery is to be laid on Base Point 641 the command is given to the Chiefs of Section, who can swing the howitzer until the lunette is over the shell case marked with the desired number. Each base point in the entire 6400-mil field of fire has a shell case buried and appropriately numbered so that when the tube is in the middle of its traverse and directed at the base point, the lunette is centered over the case. Many rechecks are thus eliminated in laying the battery, and the howitzers can be shifted to a surprisingly close position by the time the Executive Officer has the angle set off on his instrument and is ready to give deflections. This idea was conceived in another battery of my battalion and, since it is so practical, was readily adopted by the entire battalion. Possibly it works best with jacks and blocks, since with them the piece is always centered over the same point, but it could be used separately and probably to advantage."

Make Your Gunnery Practice Realistic!

Editor's note: "Machine gun in the vicinity of that lone bush" is a time-honored target designation at service practice. Good enough a few years ago, it is 'way out of date now. Artillerymen in training are pointed toward combat against either the Germans or the Japs. Neither of them follows the "lone bush" principle.

Realism can be injected into *all* our training, and we can become instilled with Jap and Jerry tactics during service practice, terrain board firing, blackboard firing—in fact, during all types of gunnery practice—by assigning targets like those we'll later actually attack. We therefore intend to publish periodically sound descriptions of typical German and Jap targets to that artillerymen in training can have an even better idea of the types of objectives they will meet in combat.

GERMAN

A forward observer working with an outfit in attack or on a pursuing mission should expect to run into the following type of typical rearguard or defense setup: a mortar, a machine gun, and a dual-purpose 88-mm antitank gun. They will be sited with all-around defense of the area they occupy and the three installations will be grouped fairly closely.

This is a very popular type of position, and should be remembered. If a unit is subjected to mortar or machine gun fire it should expect to find a gun in the group. These positions will be dug in and thoroughly camouflaged. The only hope of finding one is to be watching when fire comes from the area. If one can find any one of the weapons it will be worth a battalion concentration because in most cases the supplementary weapons will be grouped nearby. This does not apply to *every* machine gun or mortar, but any strong point will resemble this layout.

German motor transport assembled or breaking defilade can be picked up in daytime by the dust created in movement. In country where there are few passable roads, any transport in a zone of observation can be picked up easily during daylight. Assembly areas for motor transport or bivouac areas can be spotted (by use of air photos or air reconnaissance) by flaws in camouflage or new tracks in or around a wooded area or olive grove; in country where there are no trees the tracks will betray the presence of vehicles even when they are camouflaged. Lightening of the color of roads indicates increased traffic; on following up any suspicions, the transport can be spotted by air reconnaissance and photos taken periodically.

A favorite method of camouflaging tanks in a village bivouac is to knock out the wall of a house, drive the tank into the structure, and cover the open side with a canvas paulin painted to resemble the wall. Infantry patrols may discover these, and aerial photos will aid in identifying the set-up by tracks and signs of activity in the area. Fuel cans, barrels, and concentrations of motor transport and supplies may congest the area and provide an even more profitable target.

JAPANESE

This jungle's so thick and those Japs' pillboxes are so heavily constructed that we haven't been able to touch them with our mortars. How about knocking out that one under the largest palm with some of this 105 high-angle fire? Takes a delay fuze, doesn't it? And do be careful! My men are out there within 200 yards of the line of bunkers.

In this dense jungle, as soon as you open up with your artillery the Japs rush forward close to our lines and also bring their mortars down on us. I've had a tough time convincing my men the artillery isn't firing short. Can you bring your fires in close to our positions without endangering us too much?

Out there is an example of a Japanese defense system that's been causing us a lot of trouble. You'll find bunkers set as closely as five yards apart, with a second line of bunkers covering the gaps and a third line on the low ridge behind the second. Tough babies to crack, but you artillerymen ought to be able to do the job.

AA as AT

Know Your Enemies' Weapons

Libyan campaigns brought fame and notoriety to Germany's 88-mm FLAK 36, used there as an AT gun with great effect. Since then the FLAK 41 has been developed. Its reputed muzzle velocity of something over 3,200 f/s makes it an ideal AT gun: flat trajectory makes accurate range estimation less important, and short time of flight minimizes the required lead. It has appeared on two types of AT mounts.

In the lower left is a photo from the Russian front. Mislabelled in our April issue, this PAK 43 is a hybrid composed of the FLAK 41 mounted on the carriage of the 10-cm howitzer which has been modified by substituting the wider wheels of the 10-cm gun and adding a shield patterned after that on the smaller (PAK 38 and PAK 40) AT guns. Our photo source insists that the picture was not reversed in printing, which indicates that the carriage has been altered so that the trail traveling lock folds back onto the left (instead of the right) trail when in firing position.

As an SP AT gun or tank destroyer, mounted on the chassis of a PzKw IV and termed a *Hornisse* by the Germans, it has served on the Russian front and probably outperformed the "Ferdinand" SP guns. Its great size compels it to take advantage of all possible cover, and to remain in rear areas until called forward to fire on specific targets. Source of much of its high MV is apparent from its cartridge, whose firing creates such concussion that the immediate crew must protect its ears with special covers. During the night the crew gains protection by using a pit under the vehicle; straw gives additional insulation from the cold.

BURMA

By Col. Conrad H. Lanza

Britain's recent dependency of Burma is an irregularly shaped state with an area approximately equal to that of Texas. It is larger than either Germany or France — over 261,000 square miles. It extends from about 10° North Latitude to above 28° North Latitude. Although its upper areas are above the tropical zone, the entire state is substantially tropical in nature. In width its limits are between 91° 70′ and 100° 35′ East Longitude. Its general shape resembles a kite with a long tail. Due to the latter feature the north and south length exceeds 1,200 miles; maximum width, which is around Latitude 21°, is 575 miles.

For military purposes in connection with the current war Burma may conveniently be divided into three sectors:

The *coastal area,* over which any amphibious expedition would have to land.

The *India frontier,* over which a land invasion would have to come.

The *interior or central area.*

General Characteristics

Burma's inhabitants number 16,119,000, according to latest British census. Around 2/3 belong to the Burmese race, which belongs to the same family of nations as the Chinese and Siamese (or Thaians). The written language is not particularly difficult, but its pronunciation is; few foreigners acquire a mastery of the spoken tongue.

Burma is about the only country in south or central Asia where famines do not occur at least occasionally. The country normally exported three and a half million tons of rice alone per annum. A large part of this went to India. The interruption of this supply was a prime cause of the recent famine in Bengal. Due to the plentifulness of food, extreme poverty does not occur. In this also Burma differs from other Far East regions.

There is no system of caste, and no social distinctions, based on either wealth or station in life. There are no hereditary privileges. By custom, education is compulsory for boys; illiteracy among them is rare. It is not compulsory for girls, and among women there is a large percentage of uneducated. Women are well treated and respected. A married woman retains title to whatever she earns and to any property she may have had at marriage. Divorce is easily obtainable and common; in this case the communal property is divided equally among the separating parties, each, however, retaining premarital goods.

Buddhism is the prevailing religion. The people are quite devout. Every village has a monastery for its monks. About 2% of the population are monks or nuns. The monks have an elaborate organization, with a head, abbots, sub-abbots, etc. Monks and nuns are greatly respected, but neither group has any public religious functions to fulfill. They are devoted to contemplative study, in teaching in the schools, and in explaining the sacred books of Buddhism. Schools teach reading, writing, arithmetic, religion, and morals.

Under Buddhism every 8th day is a day of rest on which the people crowd to hear sermons by monks. There is a Lenten season, extending from the end of July to the beginning of October, during which all are expected to practice living on reduced rations and engage in appropriate religious duties. Buddhists are not idolators. The images of Buddha, scattered everywhere, are not idols—they are aids to the mind in fixing attention to prayers and meditations, usually offered at the monasteries or at pagodas.

Pagodas, a specialty of Burma, abound everywhere. Construction of a pagoda is considered a work of merit, and new pagodas are built and offered by those capable of doing so. Such a person then becomes a *paya-taga* (pagoda-builder), which is the highest unofficial title known.

Pagodas vary in size and shape. Some are as large as a church, having a diameter of 120 yards or more, while others may have a diameter of but a few feet. They may be all earth inside or have elaborate construction. Except in cities and at some special sites pagodas are usually covered with white stucco. In towns they may be partially or entirely gilded. As the rain washes off the gold, they need regilding about every ten years. Providing funds for this purpose is another meritorious work. Many pagodas have the eaves of roofs lined with bells which tinkle in the wind.

The majority of Burmese live in villages. These usually consist of a long straggling street. Houses are raised from the ground on posts, and are constructed of wood or bamboo frames with thatched roofs and mat walls. Villages have gates on the main road at entrances and exits, which are habitually closed at night. A guard is mounted who will open and close the gates if assured as to the identity of the travelers.

Tattooing is common among males—not among women. Buttocks and thighs are the usual places for tattooing. The design may be appropriate to the profession of the individual. For example, a sneak thief wears a tattooed cat on each thigh.

The customary dress of the men is a skirt, a jacket, and a kerchief worn in turban fashion. The women wear skirts and jackets, usually white, and no head covering except possibly a flower.

Burmese are quickly excited. Use of knives is deplorably common. Murder and robbery are much too frequent. A special feature is the dacoit. Dacoits are bandits, very prone to operate in bands for either criminal or political purposes. The last rebellion in Burma against the British occurred in 1930 and took but a few weeks to suppress, but numerous insurgents took to the jungle and became dacoits, attacking isolated posts, sentinels, and British travelers. It took years to get rid of these. Dacoits have killed their prisoners, sometimes with revolting cruelties.

Dacoits have not been entirely suppressed. Ordinarily they are plain criminals, stealing cattle and committing other crimes, but they may become dangerous guerrillas. Due to the terrain and the general abundance of food the country is particularly appropriate to guerrilla warfare.

Until recently the people of Burma were politically quiescent. The majority did not seem to be unduly interested in periodic rebellions. These were generally headed by some member of the former royal family or some pretended member. They never seemed to arouse much enthusiasm among their own people.

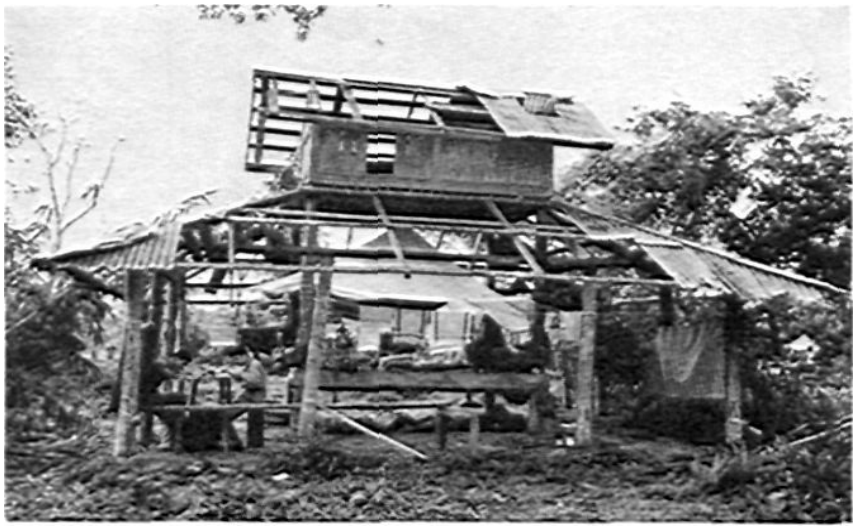
In the past ten years the people, from improved education and greater contact with the outside world, have become more

politically conscious. While not universal, a fair percentage desire separation from British rule. Their antagonism has extended to Americans, as they are thought by the Burmese to be prejudiced in favor of the British.

There is a very sharp antagonism against Indians, mainly due to economic conditions. India compared with Burma is a poor country, and the Indians have a lower standard of living than the Burmese. The entrance of Indians into Burma, under British authority, has been interpreted as an effort to reduce wages to the low India standard and is much resented. Due to this feeling most Indians fled when the Japanese invasion came in 1942.

There is antipathy against Chinese, due partly to economic and partly to national reasons.

Taking advantage of these native feelings, the Japanese have established an anti-British government in Burma. It is headed by a Dr. Ba Maw. In internal matters the Japanese are not apparently interfering with this government, but they keep close watch on everything that affects the war.



Buddhist temples are not always elaborate, or of marble, In this ruined one at Maingkwan, Chinese officers set up light housekeeping.

A Burmese Army has been raised. Very little is known about it. At date of writing no Burmese troops have been reported as in line against the Allies. Until World War I the British considered Burmese troops uncertain, and did not have any. Some were then raised and did quite well. It was considered, however, that they had not been sufficiently tested as to reliability. In the interval down to World War II the British gradually increased the Burma levies, especially for Military Police troops who guarded the frontiers and interior and isolated posts.

The British 1st Burma Division is reported as having fought well in the campaign of 1942.

Rice is the principal food of the Burmese. It is raised in all parts of the country. Wheat, potatoes, tea, and numerous fruits abound.

Agriculture is by far the main industry. Next largest is fishing. Manufactures are limited to weaving, lacquer, silver work, and similar arts. The petroleum industry and amber and ruby mines employ a certain number of people.

The climate in Burma varies over its large territory. In general the coast is very hot and moist, and considered highly unhealthy for white people. The interior is less moist, and many areas are relatively dry. Summers are usually excessively hot. In the mountains, freezing temperatures are encountered above certain altitudes.

Insects are a prodigious pest. Mosquitoes are found in large numbers; they are of great size and renowned for ferocity. On the coast it is necessary to furnish mosquito nets for animals, such as horses, cows, etc. Horseflies are a serious nuisance. Spiders of assorted species, some of gigantic sizes, are found in forests and in buildings. Scorpions are common—not deadly, but painful in their bites. White ants are a problem for supply departments; they destroy wood buildings and furniture, and eat books and papers. Red ants attack persons sitting or sleeping on the ground. A special local pest is the mole cricket, which crawls, jumps, flies, and bites; it has an undesirable aptitude for crawling up inside the clothing of men and women, and then biting.

Snakes of numerous kinds are unpleasantly abundant. The largest pythons in the world are found here. A sea variety, attaining lengths up to 20 feet, is numerous along the coast and highly poisonous. Another poisonous snake is the hamadryad, about 13 feet long; this snake frequently assumes the offensive and is dangerous. The ordinary land python may attain a length approaching 30 feet; it is not poisonous but has a ferocious bite. The snake giving the most trouble is the viper, which is very plentiful in certain areas; in such districts the natives wear high shoes to avoid being bitten after dark, when the presence of snakes can not be readily determined, and troops should be similarly protected.

Fever and dysentery are endemic and a serious problem. In spite of medical care they have caused many casualties in the past. Cholera, beriberi, dengue fever, and bubonic plague all exist. These should not cause invasion forces any trouble, as this type of disease can be kept under control by proper measures and diet. Tuberculosis is very common. Rangoon recently had the distinction of having the world's highest death rate except one, from this disease.

THE COASTAL AREA

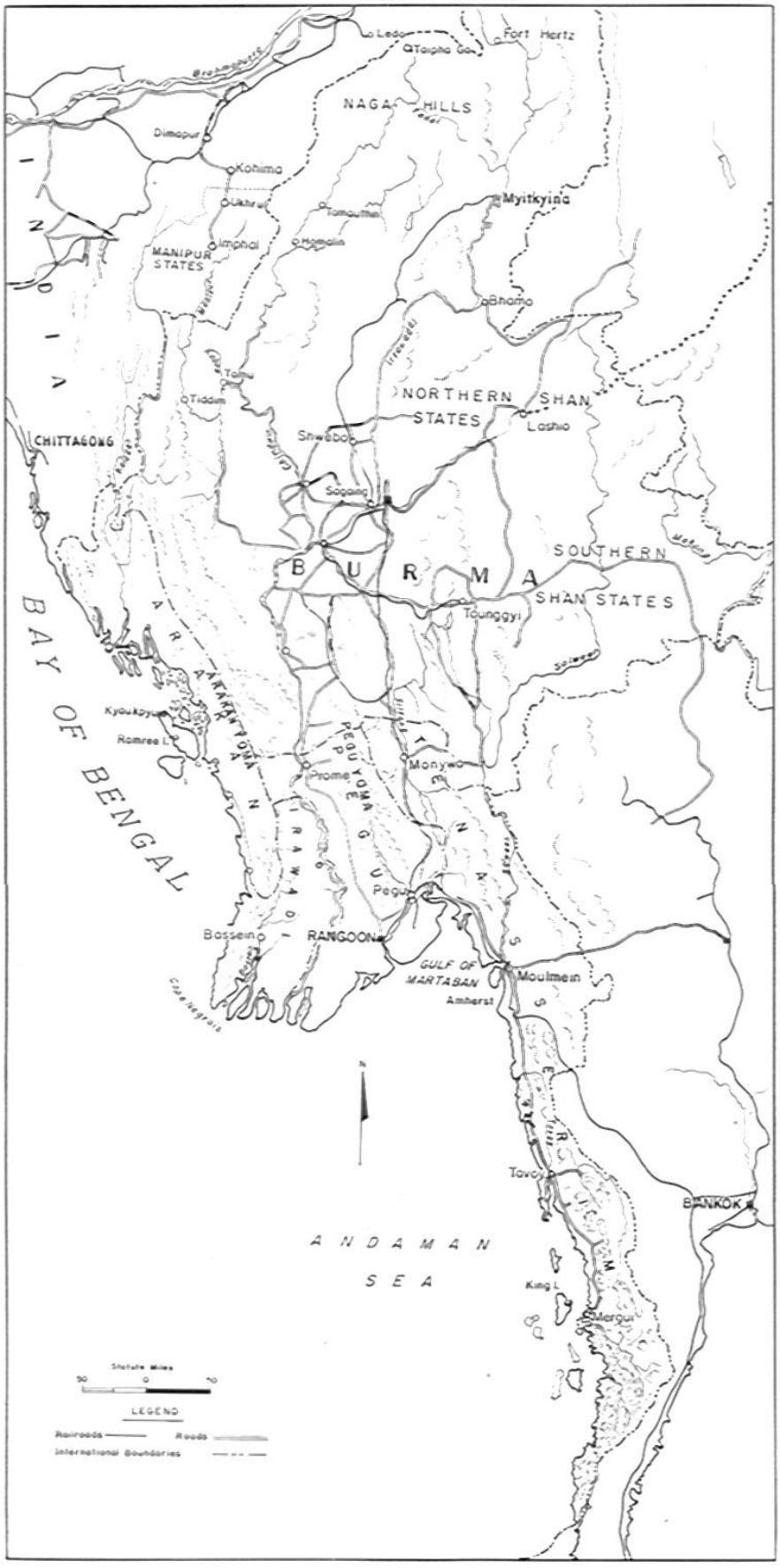
This consists of the provinces of

Arakan	**18,540 square miles**
Irawadi (or Irrawaddy)	**13,440**
Pegu	**13,084**
Tenasserim	**35,924**

The entire coast exceeds 1,200 miles. From an invasion point of view it has few beaches, much the greater part being littoral forests.

Littoral forests line the coasts and extend inland along tidal waters. They are occasionally interrupted by other types of forests. The littoral forests are usually mangroves on flat, muddy shores. At high tide they often extend far into the sea. There is a thick undergrowth of scrub. Trees are dense, 40 to 70 feet high, with dark green glossy foliage. They are a military obstacle but can be penetrated by specially-trained and -equipped foot troops.

In rear of the mangrove swamps are the tidal forests, which abound in dense bushes, vines, and high tropical grasses or reeds. The region is infested with noxious insects and water snakes, and is excessively hot and moist. It may extend far



inland. Trees do not exceed 50 feet in height. Along major streams the swamp forests may have 4 or 5 feet of water over the ground at high tide.

In the Malay campaign of 1941 and 1942 the Japanese landed small detachments of foot troops among littoral forests at numerous points. They made their way individually to previously designated points beyond. For this purpose they carried rations for several days—light for a Japanese, and not needing cooking. After penetrating the littoral forest the small detachments operated along enemy lines of communication and against detached posts and isolated parties, with considerable success. Large forces did not attempt this method: in Burma the littoral forests afford natural protection against the landing of large invasion forces.

Arakan extends for 400 miles along the Bay of Bengal from the India frontier to Cape Negrais. Its greatest breadth (90 miles) is at the India end. From there it tapers off gradually to a breadth of only 15 miles at its south end. The inland boundary is the Arakan mountain range, which separates it from the remainder of Burma. Its axis extends nearly north and south. From it, subsidiary spurs parallel to the main range separate the province into a series of valleys.

At date of writing active operations are in progress along two of these valleys, the Mayu and the Kaladan. About two Japanese divisions are in this area, with headquarters at Akyab, an excellent port.

Mountains and subsidiary ranges are jungle covered—difficult country in which to operate. The dense vegetation makes it almost impossible to determine the enemy's strength. At times concentrations have been accomplished, and considerable flanking movements made, without their being discovered until contact was made between ground troops.

The British have found it possible to make Commando raids along this coast. These accomplish demolitions and secure identifications. No effort has been made to effect a permanent lodgment.

There is one road along the coast. At places mountain spurs come down to the sea (or very close to it). These afford a series of good, narrow,

defensive positions at intervals. The enemy has taken full advantage of them.

Where the mountains are not close to the shore is found the littoral forest—hot, moist, and extremely difficult. There are so many water courses that the road contains numerous bridges and is consequently liable to interruption through their loss from bombing. The road is not hard-surfaced. Trucks find it deep mud when it rains, and deep dust when it is dry.

On the British end of the road all kinds of transportation have been tried. Wagons hauled by mules or buffaloes are in use. The buffaloes do better than imported mules. Elephants are employed to a limited extent. When everything else fails, recourse is had to bearers; these can go anywhere but can carry only small loads.

Tanks have been employed since the winter of 1943-1944. They can not operate on the hill slopes (which are too steep for them) but can operate in the valleys, where not stopped by streams (which are often excellent antitank ditches). Tank movements in jungle valleys can be observed from the air and from OPs on hills, consequently artillery support can be adjusted for them. The enemy has the same advantage and can determine where hostile tanks are moving, and their course and speed.

The south part of Arakan has rock-bound shores at places, and near Cape Negrais are a few real beaches. The mountains are close to the sea and afford good defensive positions.

Minor ports are at Sandoway and at Kyaukpyu. The latter is on Ramree Island, just off the mainland, and is held strongly by the enemy.

Arakan's rainfall is very heavy: it will average some 150″ on the coast, and in places amounts to 200″. From about the first of May until the beginning of November is the southwest monsoon, with heavy rains; the remainder of the year winds are from the northeast, with little rain. The heavy rains are for the most part precipitated by the Arakan Mountains, the rain on the far side being much lighter. Storms are common during the monsoon period and are a danger to amphibious expeditions. The forecast as to storms is severely handicapped by lack of weather reports from the Andaman and Nicobar Islands, as both are in enemy possession.

Inhabitants of Arakan number slightly over a million. They have been under British rule since 1826. They have a tongue of their own, but the Burmese language is widely understood.

Prospects of invading Burma by the overland coast road are not so good. The road is poor and unsuitable for supplying large forces. It is covered by numerous natural defiles where mountain spurs approach the coast, and which offer the enemy as many suitable lines on which to make a serious resistance.

Landings in rear of the known enemy positions would be difficult on account of the littoral forest and lack of ports. They are not impossible. If successful in seizing one of the defiles a landing would cut off direct lines of communication of enemy troops to the north. These troops could, however, retire to central Burma by crossing the Arakan range. There has been an absence of roads over these mountains, but the enemy may by now have constructed some. If not, trails exist and could be used by troops on foot. By abandoning materiel the Japanese could always withdraw and escape capture.

With this means of withdrawal open, the probable initial reaction of the Japanese to an invasion landing along the Arakan coast would be to close in and occupy defensive positions on next available spurs on both sides of the invasion area. This would hem in the landing between hostile positions to the north and south, the mountains to the east, and the sea to the west. It might require fewer Japs to do this than the force needed to seize and hold a beachhead.

Occupation of Arakan without need for direct attack will follow if an invasion force moves sufficiently northward in the Irrawaddy valley.

Irawadi and *Pegu* are two coast provinces adjoining Arakan to the south. They consist primarily of the deltas of the Irrawaddy and Sittang Rivers, which are separated from Arakan by the Arakan range. The two deltas are separated from each other by the Pegu range. The east boundary is formed by the Karen Hills. All these mountain ranges run essentially north and south.

The Irrawaddy delta is triangular, 120 miles wide at the base and with an altitude of about 150 miles. The Sittang delta has the same height with a base of only 60 miles.

Both deltas are flat country, intersected by countless water courses. Along the banks of these streams and along the sea are dense littoral forests with particularly thick undergrowth. Except in the vicinity of Bassein on the west side of the Irrawaddy there is no high land in the delta country. In the rainy season much of the deltas is flooded and resembles a vast lake.

Although this sector is but a small part of Burma it contains one third of the population of the entire country. Land is densely cultivated, mostly with rice. Flooding is controlled by embankments. The upper part of the deltas is solidly farmed except for the littoral forests. The lower deltas have some unclaimed ground.

Farmers live each on his own farm. Homes and farm buildings are on lots, usually not over a half acre in extent, which have been laboriously built up above the high-tide level. On these small areas families with their cattle (buffaloes) live for months at a time without leaving, surrounded by a flood of water during the rainy season. There are straggling scattered villages.

The whole of the delta is infested with mosquitoes. They are of several varieties, but all bite. Sand flies are a special pest.

From a military point of view, if an invasion is made in the delta country the coast first presents almost continuous littoral forest. This is real jungle, known locally as *kanazo*. If this is passed, there follows a succession of rice paddies, submerged during the rainy season, criss-crossed in all directions by water courses lined with more kanazo, which interferes with observation beyond the immediately adjacent field.

River banks are silt embankments. They are easily cut, and flooding can be arranged up to the limit of high tides.

The climate is especially hot, and the rains unusually heavy.

In spite of their torrid and tropical conditions, the deltas are the heart of Burma and the chief source of the rice crop.

The Irrawaddy River traverses nearly the center of its delta. On the Rangoon River, one of its branches, is the city of Rangoon, 21 miles from the sea. This is a broad river but the channel changes as in most silt rivers; consequently, without the customary aids to navigation ships can not safely enter it without danger of running aground. This might not be dangerous in itself, but a ship aground might block passage of other ships and would itself be an easy mark for hostile artillery and air forces.

Rangoon is the capital of Burma and the principal center of business and port of entry. It lies on both sides of the river, the business section being on the north side. The harbor

has deep-water wharves with all modern improvements. It is fully suitable for a major base, and the logical one for an advance into Burma by an invasion proceeding northward up the Irrawaddy River. It is the main base for the railroad system which extends throughout central Burma. The railroad is of 1-meter gauge. Roads extend in all directions toward the interior. The city's normal population is 460,000.

The Bassein River, another branch of the Irrawaddy, is navigable for ocean ships as far as Bassein, 60 miles from the sea. That city has a population of about 50,000 and lies on both sides of the river. Along this river are several sand beaches, the only ones in the delta area. In rear of Bassein are low hills, gradually rising toward the Arakan range. Bassein, connected by rail with Rangoon, would make a suitable auxiliary port. Where the connecting railroad crosses the Irrawaddy is the town of Henzada (25,000 pop.); although not an ocean port, this is a good river port.

Along the axis of Burnese advance are frequent "OPs" to warn of any Jap flanking move. This Chinese 'phone operator has his rifle right at hand. Behind him is a foxhole; in front, a Jap helmet.

The Irrawaddy River is the main line of traffic in Burma and the center of life of the country. It is navigable at all seasons for river boats as far as Bhamo, 687 miles from the sea and close to the China frontier. Passenger traffic to the interior now moves mostly by rail but some is still handled by river boats. The passenger boats travel only by day, tie up at night. Freight boats carry a great traffic. They habitually have a flat-boat attached on each beam. This is fitted up as a general store. At each village a stop is made to permit the natives to shop.

A large water traffic is handled by sampans, a native boat somewhat resembling an American canal boat. It is towed, pushed by poling, and occasionally may have a sail. Motor launches are specially common in the delta country.

At the east end of the delta districts is the Sittang River. At irregular intervals a tidal wave enters from the ocean. This may have a height of 9 feet and travel at a 12 mile an hour gait. It is an effectual hindrance to navigation.

For invasion purposes the Rangoon River, which affords direct access to Rangoon city, is likely to be blocked by the enemy. Any landing in the delta country will require difficult operations in watery silt, amid great heat and a vast profusion of disagreeable insects. Operations will somewhat resemble those around Shanghai when the Japanese sought to advance across the low country to the north of that city. In that case the Japs were unable, in the filth and muck, to overcome the Chinese resistance until after the Chinese lines had been turned. In the Burmese Delta conditions are even worse.

No airfields would be available to invaders until a large advance had been made. Nearest available fields would be the Andaman Islands, provided they were first captured. These would be about 325 miles distant. It would be difficult to find sites for batteries in the soft ground of the delta; special gun platforms would be needed.

There are at least a dozen mouths of the Irrawaddy available to invasion craft, and there could be as many landings multiplied by two. It is improbable that the enemy could guard such a large extent of territory. While operations would be very unpleasant and would require much time, they would not be an impossible task. The alternative is to turn all of Burma, by-passing the Irrawaddy River and first seizing Thailand, then attacking from the west boundaries of that state.

Tenasserim province, which stretches some 400 miles along the sea, is just east of the delta country. Tenasserim has three districts. Adjoining the delta country is Amherst District. Near the north end, on the Gulf of Martaban, is the city of Moulmein, a port 28 miles up the Salween River. This city (population about 65,000) was the original British headquarters in Burma, and is suitable for use as a base.

The Salween as a river rivals the Irrawaddy, but it is not navigable except from its mouth to a few miles above Moulmein, where there are extensive rapids. The lower part of this river is a delta, with the same characteristics as the delta country already described. It lies mostly to the west of the Salween. To the east are rolling, forest-clad hills and cultivated country.

The two districts below Amherst are Tavoy and Mergui. These are narrow coastal plains backed by a mountain range covered with jungle. The frontier between Burma and Thailand closely follows the watershed divide, and varies between 25 and 50 miles from the Bay of Bengal. The mountains rise to altitudes exceeding 6,000 feet.

South of the delta country the Tenasserim coast is rockbound. There are innumerable islands and islets off the coast. Most of these are uninhabited. The larger ones (such as Mergui and King Island) might be seized and developed into air bases prior to invading the mainland. Otherwise the nearest available air base possibilities would be in the Andaman and/or Nicobar Islands, an average of 400 miles away.

It would be hazardous to undertake an invasion on this coast if the enemy continues to hold the Andamans and Nicobars. From these he would be in an excellent position to raid the sea line of communications of the invaders.

There are no worth-while objectives in Tenasserim to warrant a major invasion. If a landing is made and an advance follows either up the coast toward Burma or downward toward Singapore, a situation will arise similar to that in Italy. It will be necessary to fight along the axis of a peninsula somewhat narrower than that of Italy, but just as mountainous, with numerous possibilities for the enemy to occupy a succession of defensive positions. There would be the added disadvantage of lack of good roads, and the possibility that the enemy while losing control of the sea on the west side might retain it on the east side, unless and until Singapore is retaken.

Mergui, in the south center of Tenasserim, is an excellent port and if seized and held might become useful as a base for operations of an amphibious nature against Singapore. Just

south of Mergui is a large delta country which would prevent counterattacks on a large scale from this direction. However, the Andaman Island harbor of Port Blair would be not much further from Singapore. As the enemy without control of the sea could not attack the Andamans after they have passed to Allied control those islands are more suitable for an advance base than any on the mainland, which would require major forces to protect them against overland offensives.

THE INDIA FRONTIER

This frontier is a maze of mountains, all jungle covered and forming a serious military obstacle. In the entire frontier of some 600 miles the only road prior to the present war which crossed from India to Burma was the coastal road—and this was unimproved and poor. The width of this mountain wilderness varies, but averages 100 miles.

All mountains run in ridges north and south. They are narrow and separated by deep valleys. For an east-west movement this requires ascending and descending several mountain lines, each involving steep grades, a river crossing problem, and (with the absence of roads) difficult supply conditions. Under these circumstances only three areas have so far been utilized for military expeditions.

Starting at the south end is the Arakan range, having 5 or 6 parallel chains. Near the coast these mountains do not exceed 3,500 feet in height. At the north end they exceed 7,000 feet. Everywhere are jungle and sharp slopes.

At date of writing a British force of considerable strength is operating along the coast and adjacent thereto among the Arakan ranges as far as and including the Kaladan valley. This valley is 50 miles west of the main range. After several efforts extending over two years in time, this British force is in substantially the same position as it was originally. The front of operations is also about 50 miles. With the lack of roads it is doubtful if a much larger force could be utilized.

An alert Chinese armed with a Bren watches a trail leading to the main road, as protection against a Jap flanking move.

This lack of roads has an important influence on military operations. If the enemy seizes any portion of the few roads available, and there establishes and holds a road block, detours through the jungle mountains are next to impossible for wheeled vehicles. Transportation by air, pack animals, or native human carriers can be improvised, but all these can deliver only the most essential supplies and nothing that is heavy. This year the Japanese have established such road blocks in the Arakan sector across the one coastal road and have held them for a month. These Jap forces moved on foot through the jungle and escaped detection from the air and from ground patrols until they were close to their objectives.

Due to the possibility of the few (or generally the sole) roads being blocked by the enemy, it is safer for troops in forward areas to have ample supplies of food and ammunition to last them for extended periods. If the line of supply then becomes blocked, forward troops can carry on until the blockade can be lifted, after taking necessary measures to protect themselves from an attack from the rear by adopting a hedgehog position. Operations in the jungle are very slow. One month's supply is a minimum for forward areas.

In attacking the enemy allowance should be made for his forward troops' also being able to operate for at least a month even if cut off.

Troops cut off by a road block which can not be lifted within the time for which supplies are on hand must resort to passage through the jungle around the road block. This is frequently successful, as the jungle covers the movement from air observation and with care the hostile ground patrols can be avoided.

The forests in the mountains consist of trees from 150 to 250 feet tall with clear trunks to a height of 80 to 100 feet. Beneath these are trees which branch out below the highest ones, and these in turn cover still lower trees. There are usually four to five distinct strata, resulting in the ground's being permanently dark. There is usually, but not always, a dense ground vegetation of tropical grasses and bushes which restricts movements.

250 miles north of the coast is the India state of Manipur—where polo was invented. Although a part of India, its drainage system belongs to Burma, along the border of which it extends. In this sector are other crossings from India to Burma which (since March, 1944) have been the scene of active operations with the Japanese on the offensive.

Manipur lies in the center of the frontier mountains, which are here 100 miles wide. As usual on the frontier, there is a series of narrow parallel ranges, jungle-covered and separated by narrow and deep valleys. At the center of Manipur state is an overgrown, long, straggling village called Manipur or Imphal located in a very fertile and highly cultivated plain 30 miles wide and 60 miles long and containing a large lake about 12 miles in diameter. The drainage from the lake and plain runs southward for 100 miles, via the Manipur River. Here it makes a wide U-turn, moves north, then east, and finally joins the Chindwin River, which is the principal branch of the Irrawaddy. Near where the U-turn commences is Tiddim.

There has been a road from Imphal to Tiddim for quite some time. It has not been an improved road. At the exit from the Imphal plain the Manipur River valley is a gorge with high bluffs not over 300 to 400 yards apart. Other narrow passages, all suitable for defense, are common. Beyond Tiddim the unimproved road continued on into Burma to a point only 20 miles from the nearest Burma road on the east side of the Chindwin River.

Over this route the British force of two divisions withdrew from Burma in 1942. Due to the 20-mile break where there was no road, and the fact that the withdrawal was under strong enemy pressure allowing of no delay, it was necessary to abandon all wheeled materiel.

The Japanese are using this route for their invasion of

Manipur. Since the invasion seems to have been rather carefully planned, it must be presumed that the enemy in two years has built the connecting 20-mile stretch of road and now has a road across the frontier. Obviously it is a practicable route. That portion of it north of Tiddim has been improved by the British during the same two years.

After the coast road, the Manipur valley road is the best across the frontier. In the center of the U-bend of the valley the mountains exceed 8,700 feet; at the point where the road leaves the plain the mountains on each side have an elevation of about 6,000 feet, while the Manipur plain averages nearly 2,600 feet.

Near the south end of the Manipur plain is a low pass through the mountains to Tammu. This is on the Burma side of the frontier, and a road this far was constructed by the British. Tammu is on the Kabaw River, which is another branch of the Chindwin. An enemy column has pushed across the frontier on this road too.

Leading out of the northeast end of the Manipur plain is a road to Ukhrul, 35 miles from Imphal. From there a trail crosses the mountains into Burma to Homalin, a village on the Chindwin River. The mountains on each side of the pass exceed 8,000 feet in altitude. Over this pass Gen. Stilwell's forces evacuated Burma in 1942, and this year the Japanese have crossed the mountains. In 1942 no wheeled transportation could be used on this trail. Supplies were moved by pack trains and human carriers. The enemy has improved this route to permit movement of artillery and trucks, but the exact condition of this road is unknown.

Another similar pass, which heretofore was unavailable to wheeled transportation, extends from Tamauthin on the Chindwin over the mountains to Kohima. This village is 87 miles by an improved road north from Imphal, and 46 miles southeast of the nearest railhead on the Bengal & Assam RR, at Dimapur. The enemy has attacked along this route, and at date of writing had reached Kohima. The road from Imphal through Kohima to Dimapur is the one good road into Manipur. It has been its sole line of supply.

Manipur is a semi-independent state with a native ruler. Its last revolt against the British was in 1891. Its present population is about 500,000.

The Burma ends of all the routes into Manipur start at the Chindwin River, which is navigable as far as Homalin and affords the enemy a direct water route to Rangoon. There are also transverse roads leading eastward to the valley of the Irrawaddy, which is also navigable and where roads and railroad communications are found. In the two years which the enemy has had, there has been ample time to improve routes and to establish forward bases as far as the boundary of India.

North of Kohima is the Naga Hills District. Naga means "naked," which applies to the usual condition of the natives. In this area the last rebellion against the British was in 1892. The length of this frontier is about 140 miles. Mountains rise to over 12,000 feet. There are no established routes across this area. It is not impossible, however, that the enemy may have established trails.

Just north of the Naga Hills is the railhead of the Assam & Bengal RR at Ledo. Opposite this is a pass leading over the Burma frontier to Taipha Ga, on the Tanai River (Tanai is the local name for the Chindwin). Over this pass is being constructed the Ledo road, which is ultimately intended to connect with the Burma Road. More than 30 years ago a project was initiated to construct a railroad through this pass; surveys were made, but no construction. The road will be some 300 miles long to Bhamo, where connection is to be made with the road to Chungking in China.

Along this route Gen. Stilwell's force, principally Chinese, is pushing ahead. It has crossed into Burma, protecting road construction gangs following in rear, and is approaching the halfway point to Bhamo. Part of the road is already in use for trucks. It has been possible to continue road work at all seasons of the year.

The supply of the forward troops in this very mountainous area has been facilitated by pack trains. Best pack mules are Chinese. To each 5 mules is a Chinese muleteer. The muleteers mess together, and seldom associate with other races. The Chinese pack saddle has no cinch, and rests on the mule's back by balancing loads on each side. Freight is loaded in cradles which are attached to the saddle. Saddles and crates are not interchangeable. Consequently if the proper muleteer is lost, a new man has difficulty in fitting packs. There are a breast band and a tail band to prevent loads from going over the mule's head or tail when operating on grades.

Of the Indian Frontier routes of invasion there are three possible sectors, each of which has already been crossed by sizable forces. The most promising is the central sector as this is a multiple route. The north sector is the next best route, and the coast route the least promising.

THE INTERIOR CENTRAL AREA

This area is sometimes spoken of as Upper Burma. It is bounded upon the south by the sea and its coastal provinces. On the other three sides are great mountain ranges, of which that on the India side has been described.

Parallel to the India frontier and generally within 25 to 50 miles of it is the navigable Chindwin River, an affluent of the Irrawaddy which it joins near Monywa. Monywa is about 125 miles from where the Manipur River joins the Chindwin, and has rail connections.

Opposite the Manipur area the Irrawaddy is 100 miles east of the Chindwin, separated by rugged hills which do not average over 1,000 feet high in the south but gradually increase to 5,000 in the north. On account of the jungle this range is an obstacle, and would increase the difficulties of an invasion. There are roads across it.

The entire north part of Upper Burma is a mass of rough hills and mountains. The south, in general below Latitude 23°, contains extensive plains. This is the dry zone where rainfall is limited and during the dry season (from November to May) almost non-existent. The climate is excessively hot. Vegetation is often scanty, and dust arises in huge clouds. White troops find this combination a hard one—lack of water, heat, and dust. Add to this the insect pests which abound—and life in a campaign is no joke.

This tract contains wide sterile areas, commonly referred to as "the desert" although it is not a true desert. The country is rolling and cut up by numerous deep ravines which interfere with cross-country movements of vehicles. There are many ranges of hills and isolated hills.

This arid tract is interrupted along the Irrawaddy and other rivers by low alluvial and well-cultivated ground where irrigation is possible. The best of these lands is around Mandalay, where the well farmed plain exceeds 700 square miles.

Just outside of this is the Sagaing District, which covers both sides of the Irrawaddy and is the dryest area in Burma.

Besides the north mountainous section and the south dry section, there is a third: the Shan States, which commence about 100 miles east of the Irrawaddy, below Latitude 24°. The west boundary of the Shan States is a well defined scarp for almost the entire length of that country. This area is a plateau with mean elevations of between 3,000 and 4,000 feet. It extends eastward to the far side of the Mekong River, with a maximum breadth of 250 miles.

The Shan States are extremely mountainous, there being chain after chain, all extending in the general north-and-south lines. Their inhabitants form over 40 separate states, each having its own government. The natives speak a different language than the Burmese. There are also a few detached Shan States in the mountains or North Burma.

Of the three sections of Upper Burma, the Irrawaddy valley is the most important. Here are the major cities and industries and the oil wells. The best oil wells are close to the Irrawaddy between Latitudes 20° and 21°. The Irrawaddy is the main artery for freight transportation. There are also roads and a good railroad system, the latter of meter gauge. How much of this has been destroyed by Allied bombing is unknown.

COMMENTS

1. An invasion of Burma across the India frontier meets at once the necessity of crossing a wide area of high jungle-covered mountains separated by narrow valleys. For the Japanese to cross the frontier into India around Manipur will require 100 miles of mountain fighting. For the Allies going the other way, at least 200 miles will be required.

2. The Allies have started an invasion around the central mountain section by going around both ends. The advance around the north end is making progress. To seriously threaten that part of Burma which has some economic value, it will be necessary to advance 200 miles beyond where the advance now (April, 1944) is. The Allied advance around the other end, following the coast, after two years of repeated attempts has gained but little.

3. An invasion which would follow up the valleys instead of across them would require an amphibious expedition landing in the delta country.

4. If Burma is invaded and retaken by the Allies, this will not involve in itself the loss of any other Japanese-held territory. After occupying Burma it would still be necessary to proceed with the recapture of Singapore, then Thailand, etc. By-passing Burma and proceeding first to the reduction of Singapore and Thailand would, if successful, separate the Japanese forces in Burma from their base. Ordinarily this could be expected to cause the fall of the enemy's forces in Burma within a reasonable time.

5. Consideration must be given, however, to some special features. There is so much food in Burma, especially of rice and fish, that Japanese forces could be subsisted indefinitely. They could also be clothed indefinitely, and could find animal-drawn transportation to supplement river lines. As long as the oil country is held, gasoline, even if not of best grades, will be available. In some localities oil is obtainable from hand pumps, or oozes out of the ground.

Iron ore is available near the center of Burma, but had not been developed prior to Japanese occupation. The lead mines in the North Shan States are among the richest in the world. It is quite possible that the Japanese have provided for the manufacture of some munitions, which would make Burma partly independent of direct connection with other Japanese-held territories. For this reason there is no absolute certainty that Burma would fall simply by being surrounded.

But in any case, since Singapore and Thailand will have to be taken anyway, the chance that their fall may involve that of Burma can be taken without risk. Should this not happen, nothing will have been lost. It will then be possible to either ignore Burma and proceed onward beyond Thailand to Indo-China and the China coast or else (if the situation at that time makes it advisable) proceed to the reduction of Burma, having the great advantage of being able to attack all four sides at once.

ALL SOLDIERS

If you see enemy artillery shells falling, call your headquarters and turn in a "Shellrep" (Shelling Report), giving them as much of the following as possible:

Where shells landed, when, and how many

Direction shells came from; or, if you can see the gun, where it is located, and the number of seconds from muzzle flash to sound of gun firing.

Type of gun—light, medium, or heavy.

THIS INFORMATION WILL HELP YOUR OWN ARTILLERY KNOCK-OUT THE ENEMY ARTILLERY.

From Italy, Lt. Col. R. C. Cooper, FA, writes: "This method of publicizing the importance of the SHELLREP went over big. It was designed and distributed by the II Corps Arty Sec. The demand from the doughboys far exceeded the supply."

HEADQUARTERS MOTORS

By Lt. Samuel C. Myer, FA

Three salient facts appear when considering headquarters motors in the light battalion: (1) slightly over half the enlisted men are non-commissioned officers; (2) including the attached medical, there are approximately twice the number of vehicles of a firing battery; (3) it is the normal function of headquarters vehicles to operate away from the battery and at odd hours. These facts have considerable bearing upon the difficulties of driver selection, training, and supervision, and vehicle maintenance, particularly when considered in relation to the firing batteries.

Driver selection, training, and supervision are the most important part of the motor officer's work. In garrison it is the part that receives the least attention, certainly so after the first 13 weeks of basic training. In commenting on commercial operators' successes in obtaining at least 40,000 miles of service before overhauls, and a maintenance ratio of one employee to 26 vehicles, a Holabird pamphlet states:

". . . What is behind their record of efficiency? *Well, the chief thing seems to be the driver.* Here the driver almost invariably is not hired as a driver, driving being merely incidental to his ability as a salesman. Consequently he has far more at stake than a driver's job. And yet, if he does not drive properly, which is the incidental job, he probably would find himself out of his real job. So there you are. A somewhat analogous situation might be if all Army motor vehicle drivers were non-commissioned officers or had specialist ratings. . . ."

The quotation is worth its length because it voices a truth often overlooked.

In headquarters battery the driver situation is acute. Half the battery are non-coms, which eliminates them. Half the remaining men are required for drivers, but motors cannot have the first choice as there are essential jobs elsewhere. A man of promise cannot be wasted as a driver! Of those left, a number are disqualified by eyes or similar disabilities. The result is that inevitably many hundreds of dollars' worth of equipment must be turned over to men with insufficient experience—yet if they do their work properly, these men must assume more responsibility and work harder than most corporals.

When it comes to finding assistant drivers, the situation is almost hopeless. A non-commissioned officer in a headquarters battery does not make a good driver. If he can drive, he will not have the time to do necessary maintenance: in a tactical situation he may be required at FDC to operate a radio or a telephone while the truck is in a motor park. In the second place, a non-com is almost never available for routine training in the motor park. The answer to the problem is that in some cases adequate assistant drivers are not available. Perhaps a solution would be to train half the privates in the battery as drivers, then take them off the trucks and train the other half.

Losing out in selection means that driver training and supervision must be superior, superior in the sense that it is better than excellent. This is the responsibility of the battery motor officer. His judgment and experience must be better than that acquired in 4 weeks of OCS. The battalion motor officer does not have time to supervise battery training. The manuals are excellent in outlining methods and subject matter, but to quote FM 25-10, "The success of preventive maintenance within a regiment or similar unit, depends upon the judgment, energy, ability, and common sense, not only of the commander but also of all subordinates" (par. 208*a*(5)). It is the writer's opinion that motor officers as a general rule are not selected because of their ability or background, but rather as the junior officer for purposes of training.

The author writes, "The whole thing is that no one really cares much about the driver, and as a result the driver doesn't care much about his truck. He knows he'll be changed in about six months, and in the meantime there is a new motor officer who doesn't know the score. He can get by without doing anything, he is only a private, so why should he worry and work?

"I know this all too well. Eight months ago I started off as a green motor officer, and other duty is beckoning right now. Cries rent the heavens a little while ago when I insisted that three drivers pay for parts clearly worn out because the drivers had failed to grease their trucks each week. One of them later admitted that he hadn't greased his truck himself for five months. He had always been able to get someone else to do it!

"The army is full of men of good will. Let's use as motor officers some men with good training."

Thus it results that the headquarters motor officer, without sufficient knowledge, is in charge of a quarter of the battery and perhaps thirty thousand dollars' worth of government property. To assist him he has a motor sergeant who of necessity must spend most of his time as a mechanic. If he is lucky this motor officer will have the assistance of the chiefs of section, but in most cases they will require as much training as the drivers. The time to train these men is limited. "It is the normal function of headquarters vehicles to operate away from the battery and at odd hours." This means that any class will have two or three men excused, that there will always be one or two vehicles out of the motor park when there are inspections. Sometimes there will be more than this number, further complicated by the fact that the same two will not always be absent. As incentive for the drivers there are three T/5 ratings open, plus one corporal agent and one T/4 mechanic. Thus there are 5 ratings for drivers out of 26 men, compared to 7 out of 14 in the firing batteries. Further, if in the course of training a man shows unusual ability, he must be removed as a driver to gain the rating he deserves. This is one cause of a continual flux which requires new drivers to be trained at odd times. Finally, a group of 26 men requires a different teaching technique than do smaller groups, making the job of indoctrination and instruction considerably harder.

Drivers, once selected and trained, must be supervised. The flexible nature of headquarters makes this difficult. Certain vehicles (e.g., the airplane truck) will rarely be in the motor park. Others (such as survey vehicles or staff cars) may be required when maintenance or instruction is scheduled. Their primary duty being elsewhere, it is difficult to train and require the chiefs of section to supervise daily and weekly maintenance. This puts the burden squarely on the motor officer—but to increase his difficulties, it is almost imperative that he work through the section chiefs. When something goes wrong it is hard to decide where to place the responsibility!. Such a situation is in direct contrast to a firing battery. To add to the problem, it is almost inevitable that there will be occasional changes in driver personnel which will alter the pattern of the motor park routine.

Well, says Holabird, the chief thing in commercial efficiency seems to be the driver. Second Army has figured that 53.6% of the maintenance required by AGO Form 461 (1000-mile inspection) is the direct responsibility of the driver. Probably 80% of the remainder could be prevented or discovered by an experienced man. The problem is that in headquarters battery in particular, and in all the batteries to a lesser degree, the motor officer has not sufficient training, as a direct result of which the drivers and mechanics do not have sufficient training (supervision). As long as this situation prevails vehicles will wear out at 10,000 miles instead of 50,000, and faulty maintenance will continue to be the rule.

This problem of maintenance is a particularly difficult one in headquarters battery. According to current doctrine outlined in TM 9-2810, the motor sergeant and his staff must do a 1000-mile inspection per day. This is an attainable figure, particularly in the field where there are not so many interruptions as in garrison, but it gives the mechanics little time for anything but monthly inspections. Should the vehicles travel more than a thousand miles a month, as they will in the field, it is physically impossible to reach the vehicles more than once in that space of time, and as a result it may well be a two or three thousand mile inspection. When the vehicles are new the problems are less than when they have aged, for then there is a constant battle between doing jobs which should be done and completing a 1000-mile inspection a day. Probably the latter policy is preferable as it should prevent any major breakdown. Perhaps the conflict can be resolved by a judicious adjustment of the maintenance schedule to catch vehicles needing special attention. Sometimes there is difficulty in obtaining a vehicle when it is due for an inspection as it is needed for use elsewhere. This is particularly true of radio vehicles. Lately there has been a scarcity of parts, which has meant that if certain ones were not available when a vehicle was inspected that vehicle would not be fixed for another month. This is particularly true of such items as mirrors or windshield wipers not essential for the operation of the vehicle.

In garrison, it is probably impossible to maintain the required maintenance schedule due to the many interruptions, chief of which can be listed as inspections of one sort or another. Shoe inspections, clothing inspections, command inspections, technical inspections, and the like lose time which cannot be regained. Next in line come day problems which break up the morning going out and the afternoon coming in. In headquarters, due to the number of vehicles, one day gone is one day behind. In garrison the only solution is to leave one truck in to be worked on, together with the maintenance crew. Although accidents (such as broken brake lines) will occur, they are the exception rather than the rule on short problems and a mechanic should not be required. It is probably a good idea for the drivers to go out alone, as the headquarters vehicles usually operate away from the battery in a tactical situation and as soon as driver responsibility and independence can be taught, it should be.

To do his work correctly the motor sergeant should not be burdened with details other than those related to maintenance. Except for technical advice he should be responsible for only the most general supervision of the drivers, the chiefs of section doing the rest. Tools and vehicles should be charged to the sections through battery supply, as that is the normal channel. Responsibility for the staff vehicles can rest with the staff sergeant computer, the remaining vehicles being assigned to the regular section chief. In the communications platoon it is probably most successful to assign the wire sergeant the wire trucks, and the radio sergeant, the radio vehicles; but, depending upon the personalities concerned, the Communications Chief might be responsible for the whole lot.

If at all possible, it is very convenient to have an unskilled helper in the battery shop. The best solution is to take a driver in the final stage of his training. In two or three months' work in the shop he obtains an over-all picture which helps to explain the necessity for the grind of daily maintenance. In addition, he can be trained to do most of the 1000-mile maintenance, thus gradually relieving the pressure on the mechanics. Finally, not only does it give him a change in work which often helps morale, but also an extra driver receives

1ST ECHELON MAINTENANCE

ITEM NO.	TOTAL	
4		*Horn*, Mirror, and Wind Shield Wipers
11		*Brake Booster operation*, filter loose and dry
16		*Gear Oil Level*, axles, transfer and transmission
22		*Battery*, cables, holddown, specific gravity
23		*Crank Case*, oil level
25		*Radistor*, core, cap, and gasket
29		*Drive Belts and Pulleys*, loose
34		*Air Cleaners*, loose and dirty
35		*Breather Caps and Ventilator*, not painted, dirty
47		*Tires*, value stems, caps, direction, matching
56		*Front Springs*, over lubrication
62		*Prop Shajts*, grease fitting, dust caps, alignment
65		*Clutch Pedal*, free travel
67		*Brake Master Cylinder*, vent, fluid level
79		*Cab and Body Mounting*, loose
87		*Winch*, clutch, cable, shear pin, brake
91		*Lamps*, B.O.D., head, tail, stop, blk out
94		*Hood*, hinges, fasteners, loose lub
101		*Pintle Hook*, lub, frozen in bushing
131		*Tools*, vehicle, pioneer, loose, rusty

TOTAL VEHICLES, "WHEELED" .....
INSPECTED AS OF .....
TOTAL OF DEFICIENCIES .....
GRAND TOTAL OF ALL MAJOR AND MINOR DEFICIENCIES .....

Figure 1
For minor deficiencies deduct 1 point, for major deficiencies 3 points; score of 85 or above required for satisfactory vehicle.

MAJOR DEFICIENCIES
Wheeled and Half-Track Vehicles
(See WD AGO Form 461)

No.	*Item*
3	Dash instruments and gauges
4	Horn, mirrors, windshield wipers and blades
5	Brakes (fluid low or cylinder frozen or out of adjustment or adjustment frozen)
16	*Gear oil levels too low and high
22	Battery gravity low or water low
23	Crank case (two quarts low or one quart high)
24	Oil filter dirty
36	Carburetor (governor seal or carburetor leaking)
40	Leaking (engine oil) (fuel) (water)
47	Tires and rims (valve stems wrong angle, tires improperly marked, tread wrong direction)
52	Rear wheel bearings (loose or wrong kind of grease)
57	Steering (tie rod ends loose or rod bent; steering binding or turn stops out)
60	Front wheel bearings (loose or wrong kind grease)
65	Clutch (not enough clearance)
85	Lubrication (need complete lubrication)
86	Front wheel toe-in improperly set
91	Lights (headlights, tail, body, stop, black-out)
92	Safety reflectors
96	Safety straps
100	Tail gate hinges broken or chains broken
132	Fire extinguishers

*Standards will be based on *Army Motors* of January, February, and March, 1943.

Figure 2—Back of form.

training.

Inspecting vehicles, particularly for the untrained officer, is an art in itself. The Second Army inspection teams give out two sheets which are of great assistance. The "Item No." refers to the corresponding number on AGO Form 461. These sheets are made up as the result of inspection experience of the most common errors found. To a large extent they are self explanatory (see Figs. 1 and 2).

Some battalions have had great success with inspection teams patterned after the Second Army's. These consist of 5 men under the motor officer or some other officer and are responsible directly to the battalion commander. They make a practice of inspecting one vehicle per day from each battery, and make a written or oral report of each deficiency found and the party responsible therefor. The men responsible for initiating this procedure claim that the improvement in driver maintenance which results relieves the shops of 50% of their work, permitting them to maintain the required maintenance schedules. It tends to relieve the motor officer of much tedious inspection for which he may not be well trained. Battery and battalion shop personnel should not be chosen for these teams. Usually a search of classification cards will reveal men not essential elsewhere who possess the necessary ability or experience.

Command inspections probably do not always help from the standpoint of battery maintenance. In the first place, there is all too little time to work on the trucks, and if much of that is diverted to "spit and polish," maintenance is sure to suffer. In the second place, some commanding officers seem to be unfamiliar with the details of current motor vehicles. Some staff officers seem to be even more unfamiliar, with the exception of ordnance personnel. One motor officer I know, having been highly complimented upon the condition of his vehicle, turned to the inspecting officer and said: "This here is one of them spit and polish jobs. We towed it on to the line." I know of no better illustration of the frustration felt by experienced officers when inspected by men technically their inferiors. One corps artillery commander with x-ray vision, having gigged five of my three-quarter tons for a dirty sediment bowl (i.e., dirty gas *inside* the *metal* bowl) finally allowed me to take off the sixth and empty out the clean gas; all of them having been checked the day previous. He had mistaken a metal bowl for dirty gas inside a glass bowl! About all one can do in such circumstances is to go into a corner and pull out each hair one by one.

Two months of field work highlighted the following items. Tactical motor parks are clumsy and unwieldy in a headquarters battery. Staff cars in particular are required at odd times at a moment's notice. The solution is to disperse the vehicles with each section, if possible along a road or the edge of a field under cover. It is desirable for the road to extend back from the main one, in which case sections which keep in motion a great deal should be nearest the road. CP and staff, survey, and wire are the chief of these, taking priority as the situation demands. Parking space should be reserved in appropriate areas for liaison and air vehicles when they are expected to join the battery. If these are overlooked, improper dispersion will result. The motor maintenance truck should be easily accessible toward the rear of the area and, when available, cover should be had for a turn-around and parking space for an additional vehicle in its immediate vicinity. Due consideration must be given the order in which the vehicles are expected to depart, to avoid last-minute snarls. Field artillery vehicles cannot move far from the beaten track, and even then prolonges are often indispensable. However, due to small sections, widely dispersed, the latter are less in favor than in a firing battery.

Gasoline is a problem. Unless more than one delivery a day can be expected, distribution is difficult. When cans are used, certain vehicles are sure to be out from the time the cans are brought in until they are taken back; as a result, one is confronted with the alternative of receiving less gas on the next delivery or emptying all the cans and having none ready when the cars return. The latter is the solution. Store the gas in the GMCs and drain or syphon it out when needed, taking care not to let any truck fall below a half tank. It is imperative that the drivers be trained in the results of dirt being introduced into the tank from the end of either the flexible nozzles or a syphon hose; the latter will leave deteriorated rubber in the tank if care is not exercised. Remember also that the kitchen will need from 20 to 30 gallons of gas a day for its stoves if white gas is not available. Gasoline is not a problem in firing batteries.

Our kitchens, incidentally, moved with the batteries every day except one. As corps reserve, the battalion lived a life of luxury.

Loading was a problem for two reasons. First, with only T/E transportation the battalion was considerably overstrength in both officers and men. Second, reconnaissance parties varied with every situation; as a result, the loading plan was very flexible. As a First Sergeant remarked on his return to garrison, "We had a loading diagram until we went on maneuvers."

Civilian automotive advisors must be mentioned. They can solve just about half your problems and the others don't matter much.

To sum up:

1. "The organizational motor officer should be selected from those having either technical automotive training, practical automotive experience or a particular aptitude for the work" (FM 25-10, par. 208*b*). The headquarters battery motor officer must be a technician. Upon his shoulders rests the whole tone of battery automotive work—and the situation being what it is, training and supervision must be *superior*.

2. Although headquarters is already well supplied with ratings, the degree of independent action required of the drivers merits additional ratings at least to the level of the firing batteries. "It is the normal function of headquarters vehicles to operate away from the battery and at odd hours." Responsibility, as well as skill, requires recognition.

3. "Many tables of organization do not allot assistant drivers. There is no alternative in such cases than to order appropriate men to receive driver training whenever possible, at least once a week. The resultant loss in training in normal duties of such men is surely balanced by the assurance that there are trained replacements available at critical times. These spare drivers may make delivery possible of a greatly needed weapon on time. No man can be expected to take over a strange vehicle during a blackout and arrive at his destination. An entire convoy may be disrupted by such lack of training. Too many organizations have been found where there are *no assistants*, the result is often *casualties* in men and trucks when twenty-four hour driving is demanded and when cadres are called for new units" (from Preventive Maintenance

Course for General and Field Officers, Motor Transport Special Service School Course "C," Holabird).

4. No corporal or above should be assigned as assistant driver in headquarters battery. He might be able to do the driving, but maintenance would suffer.

5. Loading charts should be made available for headquarters battery, and more emphasis placed on proper loading.

6. The motor sergeant should not be burdened with details other than those related to maintenance.

7. Chiefs of section should be held strictly responsible for their work as supervisors of first echelon maintenance. A few days of such indoctrination might well be included in technical courses at schools.

8. At least one member of the battery shop should be a graduate of the Ft. Sill motors course.

9. While technical inspections are beneficial on the whole, command inspections tend to decrease the efficiency of the maintenance.

AMERICA'S OLDEST?

By Roger Shaw

Editor's note: Although the United States is among the younger nations, it has some traditions antedating those of more ancient lands. The one Mr. Shaw describes is of especial interest. Your *Journal* lacks the space these days to serve as a forum on the subject, but we will be glad to forward to Mr. Shaw any dissent or other comment.

Far up the west bank of the sleepy old Hudson River is a fascinating place named Kingston, an historic riparian port called "Rondout" by the early Dutch. It is not too far above West Point and Father Devine's Krum Elbow, and contains many relics of sightseeing interest. Kingston was once, long ago, the capital of New York state, and the old Senate house still is there for all to admire.

There is still much Dutch blood around this area, and the local leading family (possessed of Mercedes cars which would delight any gunner) has a name your correspondent is unable to spell, though he has lodged in Holland. In the background loom Washington Irving's favorite Catskill Mountains, where the little men of the *Half Moon* play skittles against teams of selected Indian ghosts, and the eerie wildcats howl. Across the river, a little south, is presidential Hyde Park. Legend steeps the locality.

Quite in keeping with this historic region, though modernized to the hilt today, is what is believed by many to be the oldest military unit in the whole United States. It is a Kingston outfit—Battery A, 156th Field Artillery, New York National Guard. And it is one of the most versatile units that the military world has ever beheld. It started as infantry, turned into pioneer infantry, then into an ammuntion train, back into field artillery, and now is partly infantry again. And it dates back to 1658! This makes it two years older than the British regular army, whose founding date is generally given as 1660, and 17 years older than the bullying Prussian Army, which is often dated as of 1675. By the time of our Declaration of Independence, Kingston's Battery A was hoary with age. It had functioned long, long before the birth of Frederick the Great, and even before the Giant Grenadiers of Frederick's crotchetty old father. Here is the record.

Back in the mid-years of the seventeenth century this Kingston unit was a Dutch-controlled colonial group, for New York then was still under Netherlands rule. This Kingston militia was organized to fight a sturdy tribe of regional redmen sprung from Algonquin stock: the Esopus Indians. There were two wars with the wild Esopians, including a savage massacre at "Wiltwyck." Graphic descriptive material of the campaigns is still in existence for the benefit of the curious; in this account, distance is measured picturesquely in "musket shots," though how well the solid Kingston burghers could shoot is not very clearly revealed.

In 1776 this Dutch unit was reorganized into Capt. Henry Schoonmaker's company of Col. Johannes Snyder's regiment No. 1, New York militia. Note the continuing Holland names. At the close of the war, the company continued as a part of Jacob Bruyn's Ulster County regiment, and by 1812 it was included in the Ulster 131st regiment. In the Mexican war era it was Company A, 20th regiment, of New York State militia. By 1882 it was known as the 14th Separate Company, but in the Spanish war it became Company M of the 1st New York Volunteer Infantry. For four months, in 1898, it served in Hawaii with credit.

In 1905 the Kingstonites became Company M, 10th Infantry, and in the first World War they performed well as a part of the 51st Pioneer Infantry. Immediately after the war they were turned into a section of the 132nd Ammunition Train, with other train units in Newburgh, Middletown, Poughkeepsie, and Mount Vernon. In 1924 the Kingstonians finally became Battery A of the 156th Field Artillery. Other units of the regiment also were centered in Kingston, but torch-carrying Battery A is the historic group that here concerns us. On September 16, 1940, Battery A was called into Federal Service for another major experience in national and state defense. This time its language was English, though many of its names were still Dutch.

Battery A—lately at Fort Lewis, Washington—proudly carries a guidon-streamer with more silver service bands than any other unit in New York state. There are 14 of them, no mean number. The list includes Revolution, Civil War, Maryland 1862-63, Virginia 1863, Bull Run, Antietam, Fredericksburg, Chancellorsville, Gettysburg, Wilderness, Spotsylvania. Cold Harbor, Petersburg, Appomattox, St. Mihiel in the first World War.

The Kingston armory is technically tops. It can accommodate a thousand men at a time, feeding and housing them within the walls and providing game and reading rooms, mess hall, storage space, radio room, showers, officers' headquarters, a hall for athletics and social events, and an enclosed drillshed of the first rank. The 156th, which includes crack Battery A, boasts the following regimental insignia, authorized eight years ago by the War Department.

The upper left corner has a gold field with a blue cross denoting Civil War service, and a red cross for action in the Revolutionary War. The right side of the insignia has a blue ground indicating infantry service. On this blue ground is enscribed a tare leaf, symbolic of service in the Philippines, and a Fleur-de-Lis indicating service as infantry in the World War. The lower left side is a red space without markings, which means that the unit now belongs to the Field Artillery but has not seen active service as such. Separating the two sections of the insignia is a white band which represents the Hudson River dividing the units of the 156th Field Artillery.

On December 18, 1940, three months after the Federal mobilization of the 156th with its Battery A, the present "home" units of the New York Guard were organized at Kingston, as elsewhere, including a "pro-tem" company of the "56" regiment which helps to carry on the old 156th tradition. It is armed with Enfield rifles, Thompson and Reising sub-machine guns, and gas guns. Formerly, there were some shotguns, but these have been replaced by additional Enfields. First under Capt. Allan Hanstein, it is commanded (since Hanstein has joined the U. S. Army) by Capt. Charles Arnold. Come war, come peace, old Kingston carries on. If any critic can match this record, your correspondent would like to hear about it. A challenge? Certainly, and at dawn.

FIELD ARTILLERY TRAINING CENTER IN CHINA

Entrance to old compound used as temporary school buildings while new barracks and class rooms were being built by thousands of coolies. This compound had been badly bombed in 1941; in 1943 we had many alerts but relatively few bombings.

By Col. Garrison B. Coverdale, FA

In Southwestern China is a miniature Fort Sill that very few know much about. As time goes on, however, this School will assume greater importance and will become well known to many artillerymen.

The Field Artillery Training Center in China was organized early in 1943. It was my good fortune to be among those who selected the site, prepared the courses, and instructed the students. We taught Chinese artillery officer students, equipped and trained Chinese artillery battalions, and trained cadres for new artillery units.

An inspection of the artillery in China made by American officers late in 1942 and early in 1943 brought to light an assorted group of artillery pieces from various nations. There were 75-mm Japanese pack howitzers, French 75-mm guns (model 1897), Russian 3-inch guns and howitzers, and German pieces up to 150-mm howitzers. Practically all this assorted artillery was badly in need of ordnance repair. Mobile ordnance teams were organized and trained at the School, and after 6 months actually took to the field to put the Chinese weapons into fighting condition.

Officer students are receiving instruction in service of the piece. Note how much the terrain resembles Fort Sill's. We even had a Signal Mountain.

Mud bricks were hauled by water buffalo and cart to the buildings being built for the School.

One of our difficulties at the School was the language problem. Interpreters, mostly students from Chinese universities, were furnished by the Chinese government. All the American instructors had been given a basic course in Chinese, and by the time the School opened many had a good foundation in the spoken language. This basic knowledge was supplemented by specialists' instruction so that the gunnery instructors could conduct fire in Chinese, the materiel instructors teach in Chinese nomenclature, etc. When interpreters were used for conferences or critiques the instructor spoke directly to the class in English, generally not more than 2 or 3 sentences at a time. These were translated to the class, and as Americans and Chinese got used to each other the quality of the instruction improved greatly. Surprisingly enough the American instructor could put a great deal of personality into his conference or critique: his vitality and enthusiasm were transmitted to the class even though they did not understand his words.

Telephone operation presented another peculiar problem that could be found only in China—we had different dialects to contend with, principally Cantonese and Mandarin. Although speakers of the several dialects could understand each other fairly well when face-to-face, the strange telephone instrument and the separation furnished at least a mental hazard. All, however, knew Mandarin (the official language

Another view of the terrain. Our elevation was about 6,500 ft.

Lt. Zieminski and a group of students in a materiel class.

Officer students make a "squaw" bitch. The Chinese are quick to learn from demonstrations—generally they can step up and perform the same operation after one careful demonstration.

These Chinese majors and captains, learning to disassemble the breech block, are being prepared to serve as assistant instructors for the 2nd course.

A Phillips "China Special" pack saddle was built especially for the smaller animals.

Holding the mule is a Chinese soldier in winter uniform. The men saddling are officer students. In background is Major Carlton Russell with one of the howitzer mules; beside him is the interpreter.

of the School) well enough to understand the instruction.

About the 6th week of our first course I tried the experiment of having American officers speak Chinese over the radio to each other in competition with Chinese officers using their own language over the phone. A Chinese officer student was conducting fire at the OP, a team of Chinese student officers handled the OP-GP phones, and the American officers operated the OP-GP 610 radios. The officer firing gave his sensings and commands in Chinese, both communication teams relayed the latter to the GP in Chinese, and in the same language commands were given to the student executive; incidentally, student officers also acted as cannoneers at service practice. The American officers using the radio averaged a few seconds faster on each command so the entire problem was fired using their transmissions. We gained much "face," and after this incident the efforts, at least, of the Chinese operators improved somewhat.

Supply was of course a problem throughout.

Here is Col. G. B. Coverdale on a typical Chinese horse, actually the mount of the commander of a battalion of School troops. All American officers walked on pack marches. In the background are coolies.

Materiel class in foreground, pack class in background.

The Commandant of the School had arrived in China late in 1942 and inspected a large part of the Chinese artillery and the terrain over which it would work. He requested of the Chinese officials the pack animals (native horses and mules) we would need to train the required pack battalions. These animals ranged from very small to medium size. The mules seldom were heavier than about 700 pounds and a large one would be 13 hands 2 inches in height; any that approached this size were considered suitable for the howitzer loads. Test marches at a later date proved that these small animals could pack the howitzer loads (maximum pay load about 250 pounds) for 15 miles on mountainous trails, and after a rest of 2 to 4 hours continue another 8 to 10 miles. Using the native sawbuck saddles, the smaller mules and horses could pack 6 to 10 rounds of ammunition depending on the size of the particular animal. As the normal pay load here in the States is 10 rounds of ammunition (230 pounds) for our fine large mules, one can readily see how tough and wiry the Chinese animal really is. From the accompanying pictures the various sizes can be easily seen; unfortunately I have no photos of the mules packed with the howitzer loads.

In view of the difficulties, we considered the results of our first 8-week class very satisfactory. Students performed all

The Governor of Yunnan Province in a lieutenant general's uniform got a big thrill from the American radio.

required duties and received intense training in gunnery, materiel, animal transport, communications, tactics, and motor instruction (a very small amount). Gunnery instruction was made as simple as possible, observed fire being limited to forward observation and small-T bracket. Students were given position area survey, observed fire chart work, and fire direction, with such good results that the time devoted to these subjects was materially increased for the second class.

In the first course we started with small-T bracket and worked later into forward observation. In the second course, two months later, this order was reversed with excellent results. Instruction in small-T bracket included registration on the base point, seeking a ½-*c* bracket the center of which was taken as the adjusted elevation. *s* was to be considered in all cases, but if its value was 2 or less it could be discarded. Forward observation methods proved very popular with the Chinese students and actually could be used practically throughout.

The enthusiastic, willing, younger Chinese officers who were our students, were very favorably impressed with American massed fire. We could easily show them on the ground that in most cases a massing of fire actually saved ammunition as it accomplished the mission before the enemy could move or protect himself. To the older and senior group who attended the demonstration, however, it was much more difficult. They had endeavored to save ammunition so long that to fire more than one gun at a time was considered a waste of ammunition.

The Chinese are being equipped and trained to fight by people who know their job. It may be a long-range effort, but certainly the final goal is in sight. The armies have certainly improved recently, and with well-trained and -equipped artillery battalions a tremendous additional improvement can be expected.

Selling Artillery Support to the Infantry

By Capt. Thomas Dransfield, III, FA

Infantry commanders are usually well versed in the proper employment of their own supporting weapons, but judging from the reports on various operations in all theaters of action they have not always shown a similar knowledge of what their own artillery can do for them. As a consequence their troops have had a more difficult time in making progress. As infantry commanders they are well sold on the capabilities of their own weapons because they have the knowledge upon which to act and properly employ them. If they were similarly sold upon their supporting artillery they would undoubtedly make things easier for their own troops. It is the proper job of the artillery to sell itself to the infantry.

The recently concluded operations of the 7th Infantry Division on Kwajalein Atoll in the Marshall Islands are among the most convincing and demonstrable proofs of this thesis in the Central Pacific Area. The results obtained were possible only because the infantry had great confidence in their supporting arms. My purpose is not, however, to give a picture of the operations, but rather to discuss some of the aspects of some of the problems involved from the viewpoint of an artillery liaison officer with an infantry assault battalion.

It was most gratifying to watch the infantry advance with close support, confidently certain that the artillery forward observers with them knew what to do and were doing it. Front line troops must have confidence in their artillery forward observers. All artillery officers do not make good forward observers. The infantry are quick to find this out, but artillery commanders must be even quicker and must weed out unsatisfactory observers before they get the opportunity to show any weakness in battle.

In addition to technical qualifications (which need not be discussed here) a forward observer must be emotionally stable, otherwise he will react most unfavorably under small arms and mortar fire. If the forward observer is mentally neutralized and does not shoot when support is needed or else shoots incorrectly, the resulting confusion and hesitation in the front lines may delay and jeopardize the success of the operation. The forward observer is responsible for the results obtained from artillery support, and when he produces the results, the confidence problem is half solved.

Moving from the forward observer to the artillery liaison officer with the infantry battalion commander, we find the key to the other half of our sales problem. It is largely through the efforts of the liaison officer that the infantry and the artillery are welded together as one strong, effective weapon. The liaison officer must be a salesman, and he must sell the idea and picture of coordinated fire power to the infantry commander. The successful liaison officer will find the infantry commander relying upon him for recommendations and advice on all types of available support and will frequently be the man to coordinate air bombardment and strafing, naval shelling, tanks, and even the cannon company when it is employed as a field artillery battery. The training period prior to combat is the best time to lay the foundation for the coordination of arms.

During the intensive training period prior to the Kwajalein operation the artillery liaison officer with his section had ample opportunity to work with the infantry battalion to which he was assigned for combat. Both he and the infantry commander became fully acquainted with the mechanics involved in the mutual exchange of information and problems peculiar to each cooperating arm. The enlisted men of the liaison section became acquainted with the key men of the infantry battalion CP-OP group and familiarized themselves with the sources of primary combat intelligence. These contacts later proved invaluable in permitting immediate action on information as it was secured.

Frequent problems in the field involving the firing of all weapons and close artillery support gave the infantry an accurate picture of what massed artillery fire could do, and gave artillery personnel a complete picture of combined infantry and artillery fire support. Thus the infantry learned how and where to request supporting fire and what to expect in the way of results while the artillery personnel learned a tactical evaluation of all types of targets with respect to all available types of fire support. The cooperation and mutual understanding achieved in training were carried into battle. The infantry were sold on their artillery—and the results achieved on Kwaialein proved it.

MOBILIZING YOUR THOUGHTS

By Maj. W. P. Woodruff, FA

Part II—Study Procedure

In Part I we treated the basic elements which go to make up any study situation. Those three elements were: (1) *the Place* (where you study), (2) *the Person* (you or the soldier doing the study), and (3) *the Work Schedule* (planning when to study). Now, let's investigate the mechanics of actually studying. There are five essential principles around which study procedure must be based: *Concentration, Logical Progression, Association and Organization of Ideas, Discrimination*, and *Repetition with Time Breaks*.

1. CONCENTRATION

Definite things we can do to force concentration are:

a. Start immediately. Get your equipment and publications ready and then really "tie in to them." If you have trouble getting started, try softly reading aloud for a few minutes. This will force you to keep your eye on the printed page. You will have to look at the words to see what to pronounce.

b. Read "purposively" and fast.

(1) Read with the intent to remember. After all, the information will have to be used immediately and continuously. Lazy scanning and mere looking at the FM is not studying.

(2) Read rapidly. Most good learners do this. It permits you to cover more ground and gives more time for review. Speed in reading can be increased with practice. Some tips on developing speed in reading are:

(a) Keep lips still. Do this after you have gotten your attention fixed on the subject by reading aloud to yourself. "Turn on the steam" after you are concentrating and it will help keep your attention fixed.

(b) Take in several words in one glance.

With these tips go some CAUTIONS:

(c) Skipping causes you to miss "bone points." It also wastes time because you have to go back and pick up the trend of the explanation.

(d) Slower pace is necessary when studying difficult texts and material not purely informational—but this is no license to take 2 hours for a 15-minute job.

c. Allow a specific amount of time. This pressure helps force you to get down to business and drive hard. Provision for time limitation is made in your Work Schedule. The emphasis here should be to put "the squeeze" on yourself.

2. LOGICAL PROGRESSION

This is the principle of going from what you know to what you don't know, from the simple to the complex.

a. Review preceding material before going on to the new:

(1) Orients, like one of the three functions which must be served by the introduction to every period of military instruction. Do just enough reviewing to show the relation between the old (known) to the new (unknown) material. A good way to keep new material from being mere isolated facts is to look over notes or an outline of the previous sessions.

(2) Serves as a "warm up" to carry you into the details of new material.

b. Go from the whole to the part:

(1) Why? It furnishes "memory pegs" on which you "hang" the details.

(2) How?

(a) Summary. If there is a summary at the end of the chapter, read it first. (To conserve paper, a summary outline has been omitted from the end of this article.)

(b) Paragraph titles. When there is no summary, as is the case for most of our FMs and TMs, first read all paragraph titles in the assignment; they are indicated by heavy bold face type. In spite of the grumbling, I have yet to see a FM where the discussion was not concerned with the topic indicated by the paragraph title.

(c) Topical sentence. As the second step in going from the big picture to the details, read the paragraph title AND the first sentence following it. In military publications you will frequently find it is the topical sentence. Numerous exceptions do not warrant elimination of the guide just stated.

(d) Details. Finally, and for the first reading of the complete assignment, read the paragraph title, topical sentence, and remaining sentences.

(e) *A caution:* When memorizing lengthy materials (for example, conventional signs and symbols) or very difficult material, use information gained by inspection of the entirety to subdivide the whole assignment into a few logical wholes. FM 21-30 does this job for you with conventional signs and symbols. Keep going over one of the entire subdivisions until you have learned the whole. This procedure also permits you to mark off more difficult and unfamiliar material for intensive study.

c. Use the additional aid for learners:

(1) By the instructor. Some instructors point out "memory pegs" by calling their men's attention to highlights in the study assignments. They do this when announcing study assignments or by making reference to published schedules.

(2) In published schedules. A good way to give helpful guides in these is to follow the system used at the C&GS and FA Schools. Both of these now designate portions of the lesson assignments in the schedules as "study," "read," "scan," "review," or "solve." Each indicates a different degree of preparation as defined by a "poop sheet" previously issued the student.

3. ASSOCIATION AND ORGANIZATION OF IDEAS

a. Learning involves mental reaction. Mere reading and cramming do not get the job done. In mere reading there is no reasoning. In cramming, one attempts in a short time to put a large amount of material at his disposal for immediate use. Critical reactions, analysis of implications, questions and

answers, and careful re-reading are needed before one can assume he has mastered the text.

b. State points in your own words and make an illustration using them. When you can do this you have not merely memorized. For example, in tactics or communications draw a schematic diagram; in gunnery, fire a problem. For ideas on *Self Instruction in Gunnery* see the notes by Col. Eric A. Erickson on p. 612 of this JOURNAL for August, 1943.

c. Use underlining. This is very desirable, but should be confined to books belonging to you personally. Don't deface issued texts. When you do intend to underline your own books, read the whole paragraph before underlining any part of it. Useful purposes of underlining are to

(1) Designate points you do not understand.

(2) Indicate key points, important facts to be considered and remembered.

(3) Make a word, sentence, paragraph, or idea easy to locate when reviewing.

d. Take notes:

(1) In self study. Since most of the texts used by army personnel are not their own property, we must accomplish the purposes of underlining by notetaking.

(a) Be very brief. A detailed, full outline is definitely wrong at this stage of your study.

(b) Be systematic. It is important that the same system of notetaking be used for all subjects. This makes for straight thinking, avoids unnecessary confusion. Since the army is our profession now, we might just as well use the system of paragraphing provided in AR 340-15.

1. MAIN POINT
   a. Sub point
      (1) Refinements
         (a) . . .
            1 . . .

(2) In classes. To devote all serious effort in self study and then neglect technique of learning in classes would be a case of "saving at the spigot and spending at the bung." Most of the techniques of self study treated in this article apply with equal force to class learning. The training program is unquestionably expedited if the learners are told to (and then do) take the mental attitude of attention, train themselves to ignore outside interference, work with the specific intent to remember, etc. Many learners need some help in notetaking. Some tips:

(a) System. Same as in self study.

(b) Kind. The method of instruction largely determines the kind of notes a learner should take.

1. In a conference or demonstration. Assuming the instructor follows the advice of pars. 37-41 and 45-48 of TM 21-250, the learned should jot down only the summary or just a few words to point to the solution of a problem. The instructor should advise the learners:

A. Don't try to take detailed notes in a conference.

B. Keep your attention on the discussion.

C. When a classmate is in action, picture yourself in his position. Think what answer you would give to the question he is answering, or the answer you would give to this question.

2. In a lecture. More detailed notes are in point here. But a man is sure to get lost if he tries to obtain a verbatim copy of the lecture. While it would be very helpful to re-write the notes in his own words and in more detailed form, few students have time to do that task now. From the instructor's point of view the lecture must be so clearly organized that it presents an outline of the points discussed.

(c) Should students always be required to take notes? Usually, no, although it is advisable to suggest they take down references to particular paragraphs in FMs and TMs for further study, or some other special item of information. Generally more harm than good will be done by the blanket order "take notes on this conference," because full note taking is likely to degenate into a vain attempt to write down every word.

Since many students copy down what appears on charts or is put on the blackboard, it will help them if you and I put only important facts on them.

e. Consult seniors. If you are still stumped after seriously trying to work out the use of principles yourself, see your superior. Early help is vital in this mobilization training because it:

(1) Saves time. You don't get the wrong idea implanted in your mind which later must be "unlearned" and replaced with the correct impression.

(2) Avoids confusing those we are training.

The instructor can render this same service to his men by being present to give assistance during supervised study periods.

f. Devise memory bracers. Contriving a memory bracer is a useful way to summarize points and rules of procedure. For example, the number of days in a month is easily recalled by the jingle "30 days hath September, etc." The usual field artillery adaptation of this device is to employ a word in which each letter indicates a different key element. Among our most common memory crutches are WORM, LEWOG, and LARS.

Memory bracers can be very helpful in learning and recalling data. The most important general caution is to guard against forgetting what the bracer means. Three aids in accomplishing this are

(1) Thoroughly understand the facts behind the crutch.

(2) Use them frequently.

(3) Don't try to put all your data in this form.

4. DISCRIMINATION

a. Defined. Apply the law of the survival of the fittest; remember "bone points" and important details. You can't remember everything, and usually it isn't necessary.

b. Self-correction. The principle of discrimination does not mean we can take a chance that we have remembered the main points and important details. Techniques of self checking to assure ourselves we have learned the significant elements include:

(1) Questions:

(a) After reading a paragraph, stop and ask yourself questions on the material just read.

(b) Prepare a few written questions as you read and try answering them, with text closed, after completing the entire assignment.

Especially in supervised study periods some instructors have found it desirable to help their men do this job. They prepare typewritten questions on the assignment and issue them after the assignment has been studied.

(2) Summarizing:

(a) Orally. After you finish reading the material make an oral digest of the entire lesson.

(b) By outlining. Make your first full outline after you have completed reading the entire assignment, and without

reference to the text. This will test your power to recall important points in a logical sequence and definitely show whether or not you know the essential explanation of those bone points.

(3) Re-reading. Checking your solution (oral, summary, outline, or answer to questions) against the text is a *must* in effective study. This enables you to put your finger on precisely what you do not know about the subject.

(4) Value of self checking. Before actually doing any of this self-correction stuff, you want to know the answer to two questions: first, is it really worth-while? And second, if so, how much of my study time should be used in self checking?

(a) Return on your investment. Assuming you have devoted 40% of your study time to self-checking, and this moment is 4 hours after completing your study, you will know about 36% more of the material studied than you would know if you had done no self-checking. Hence, the effort is very worth-while.

(b) Maximum time which should be devoted to self-checking is 40%. While some increased return can be obtained by spending as much as 60% of your time in self-testing there is not enough additional return to justify the extra time.[1]

In addition to getting more of the material to stick in your mind on the original studying, self-checking serves another excellent purpose: it points the way to selective review.

5. Repetition with Time Breaks

a. Selective review. Haphazard reviewing is largely a waste of time. Point your reviewing to specific points which were indicated in the self checking. As a minimum these points should always include:

(1) Those you don't know.

(2) Those which are known, but which need to be "overlearned."

(3) Those which may form the basis for new points of view, enriched appreciation, and creative work.

Even in review these specific points must be studied in their relation to the whole topic.

b. Necessity for repetition. We forget much and very rapidly soon after initial learning.

c. When to review. Distributed review is better than "taking the whole prescription in one dose." For best results, the first review should be a rather detailed one within 3 days after initial study. The second review need not be so detailed as the first one provided it is done within a week after initial study. The next reviewing should be about one month after the first study, and subsequent reviews can be spread out over periods of half a year.

If you are interested in the basis for the statements in subparagraphs *b* and *c*, see Appendix II, below.

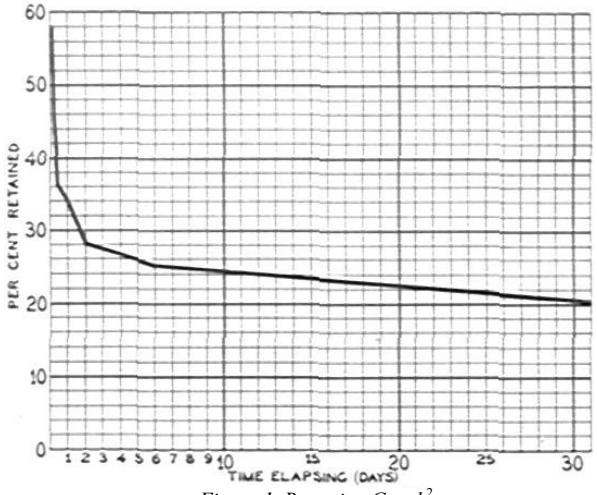


Figure 1. Retention Graph[2]

[1]The basis for these answers is presented in Appendix I, below.

[2]Reprinted, with slight modification, from H. E. Garrett, *Great Experiments in Psychology* (1941 Ed.), page 273, with permission of D. Appleton-Century Company, Inc., publishers.

Appendix I

Effectiveness of Self-Testing During Study of Significant Material

Per cent of time spent in self-correction:	0	20	40	60	80
Per cent remembered:					
(a) Right after learning	35	37	41	42	42
(b) After 4 hours	16	19	25	26	26

Note: This significant table was prepared with the assistance of Dr. Henry E. Garrett, Columbia University, and is based on the original research done by Dr. A. I. Gates, as published in Columbia University Archives of Psychology, Monograph No. 40, *Recitation as a Factor in Memorizing*. This publication of the original material is done with the authorization of Dr. R. S. Woodworth, Editor, Columbia University Archives of Psychology.

In interpreting the above table, I have heard the question asked: "Suppose there were exactly 100 items to be known about survey plans and procedure. I have the list of items and spend 40% of my time in self-correction. Four hours after studying it the first time, should I know (a) 15 of the items (25 × (100—40)) or (b) 25 of the items (25 × 100)?

Dr. Gates's original study leads me to believe the answer is 25 items. The question itself is merely getting at the problem of how much of the entire lesson should be studied if you do use part of your total available time in self studying. Whether a person spends 20% or 40% of his total study time in self testing, he still is supposed to cover the entire lesson, in this case the full 100 items. Consequently, if he has but one hour to spend on studying these 100 new items, and he decides to use 24 minutes of this hour self testing, then he will have to cover the whole 100 items faster in his initial reading than he would if he were going to spend only 12 minutes self testing.

Appendix II

Need and Value of Repetition

1. *Need for repetition*. We forget fastest and most rapidly soon after studying. Fig. 1 shows that the first week after studying a subject is the most critical. At the end of that time you will already have forgotten most that you will ever forget about the subject. During this week the first 2 days witness the greatest forgetting. Here we have the great reason why an instructor should review immediately before conducting any period of training; he will have more of the material immediately at his finger tips. And the chart also shows why learners cannot be expected to remember sometime next week many of the details covered this week if they had only one exposure to the subject.

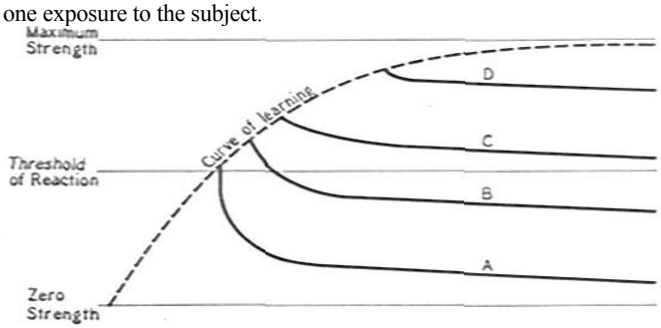


Figure 2. It pays to "overlearn."[3]

[3]Reprinted, with slight modification, from Gates, *Elementary Psychology*, page 328, with permission of the Macmillan Company, publishers.

Note: If you retain only some 30% of what was studied, it means you have forgotten 70%. This chart would be most discouraging indeed if it also proved that each time we re-studied a subject we would still forget as much as we do after the original learning. Fortunately such is not the case. The probable influence of disuse in the case of functions overlearned in various degrees is shown in Fig. 2.

Here the lettered curves represent functions: (A) barely learned (can merely repeat the function), (B) overlearned slightly (e.g., with reference to carbine marksmanship, is a marksman), (C) overlearned considerably (e.g., is a sharpshooter), and (D) overlearned greatly (e.g., is an expert). In each case the initial loss is rapid. Particularly in cases A and B the total loss is also great; there the soldier drops below the degree of efficiency needed for combat. In all cases, after the initial forgetting the soldier continues to forget some, but at a much slower rate.

Cautions: (1) These lettered curves do *not* represent any number of repetitions necessary to obtain a particular degree of efficiency. They merely show that the better a soldier learns to do a job, the less he will forget about it. For example, while no one will ever be able to shoot a bull's-eye every time, some soldiers will closely approach it—occasionally after very little practice. Another soldier may never be able to get beyond a marksman (curve B) regardless of how many times he practices.

(2) The dotted "curve of learning" should not be taken to mean that a person will always continue to progress without any "breathing spell." If you were to magnify any portion of this "curve of learning" it would appear something like Fig. 3. Unquestionably there are periods where it appears that little or no progress is being made. On the other hand, the first exposure to an entirely new subject usually results in very marked progress. That is because the learner is starting from "scratch"; he has the entire field to master. A cannoneer, for instance, will pick up numerous duties in service of the piece in the first training. The second day he may show no additional progress. With continued practice, however, he develops ability not only to do more of his duties, but to do them with greater speed and accuracy.

Figure 3. Enlarged portion of learning curve.

2. *What degree of overlearning is desirable?* Great overlearning (D) is necessary for actions which must be done all the time, such as driving a vehicle or being a gunner. For much field artillery work, however, the proficiency represented by curve C is adequate.

3. *How can one overlearn?* Assuming the soldier has the capacity to "overlearn greatly" and has studied until he can make one correct recitation, it takes very little extra effort to "overlearn" and thus keep above the minimum degree of proficiency required for combat. The best way to "overlearn" a subject is to review it many times after you think you know it pretty well.

Hot Tips on Hot Weather Vehicle Operation

About the only thing most car owners do when summer comes boiling around the corner is to have radiators flushed, oil changed, and the "old bus" lubricated. But in the Army, things are different. Hot weather operation calls for repeated attention to numerous preventive maintenance services in order to insure reliable vehicle performance at all times. The more important of these services have been listed by Maintenance Division, A.S.F., for special emphasis by all concerned in the hot months ahead, and they will probably be incorporated into a poster to be distributed to posts, camps and stations.

Batteries must be serviced more frequently "in the good old summer time" because they operate at higher temperatures. This causes the electrolyte to "boil" (or evaporate) faster. Care must be exercised, however, not to put too much water in battery cells because it will "bubble" out of the vents and accelerate corrosion of cables, terminals, and clamps.

Tires should be inflated in the morning when they are cool. Pressures will normally increase during the day due to the sun and heat generated by the flexing action of tire sidewalls. When tire pressures are checked during the day and are found to be high, they should not be reduced or "bled" because the pressures will return to normal as soon as the tires cool off.

Cooling systems require special care. They should be flushed out thoroughly. The thermostat should be checked, and the various hose connections should be inspected and replaced if necessary. Clean "soft" water should be used in the cooling system and, when the technical manual for the vehicle calls for it, rust preventive should be added. The water pump must be in good condition, and the fan belt should be inspected frequently and its tension correctly adjusted.

Ignition timing should be checked carefully. Late timing, particularly, can be a contributing cause to overheating of the engine.

Accumulated grease on the under side of the crankcase tends to "insulate" it and thus prevent the oil from dissipating its heat by radiation as efficiently as it would otherwise. For this reason it is important that grease be scraped off.

Careful driving is also an important means of preventing overheating. Slow speeds in high gear, especially on hard cross-country or up-hill pulls, must be avoided. When the vehicle and fan are both operating at reduced speed, an insufficient amount of cooling air flows through the radiator. By shifting to a lower gear the fan will speed up and provide adequate cooling.

In this connection, nearly all of us are conscious of the increased "pinging" of engines on hills that has come with the lower octane numbers of wartime gasoline. This destructive detonation, to be avoided at all times, is particularly harmful in summer when a laboring motor is always an overheating motor.

Sand and dust are generally more prevalent in the summer due to the drying effect of the sun. This makes it necessary to wash air cleaners more frequently and, under extreme conditions, to replace oil filter elements more often.

Special attention to these summer-time preventive maintenance services will enable drivers to keep their vehicles running smoothly despite the extra stresses put on them by torrid weather. In the meantime, don't forget to keep a weather eye on the temperature gauge. At the first tign of trouble, take necessary corrective action. Only in this way can the serious damage that results from overheating be avoided.

JUNGLE COOPERATION

Task force attachments have become commonplace in the last few years, but a new variety is now reported from Burma. Lt. Col. T. M. Dupuy, FA, writes:

"You might be interested to know that Major Su Sing was largely instrumental in saving an American hospital unit from attack and capture by a Jap patrol. Through error this hospital had been left without protection during a wide envelopment. He attached them to a battery of his which, also through error, was far in the rear of the main column. He provided automatic weapon support from the none-too-strong defenses of the battery. This small unit was subject to considerable artillery fire and frequent enemy patrol action before they rejoined the main column."

Diary of War Events

(As Reported in the American Press: Edited by B. H. W.)

APRIL, 1944

1st Powerful Pacific Fleet task force attacks Palau, Woleai and Yap Islands. Sink 28 ships and destroy 214 planes. We lose 25 planes and 18 men.

2nd U.S. troops increase their beachhead at Empress Augusta Bay and score new advances near Bogadjim, New Guinea.

3rd U.S. forces occupy 10 more atolls in the Marshall Islands.

4th Allied fliers wipe out entire Jap airforce of 288 planes at Hollandia, Netherland New Guinea, in three attacks.

Flying Fortresses and Liberators from Italy bomb Bucharest, capital of Romania.

5th Allied bombers from Italy continue to aid Soviet forces by attacking Balkan targets.

Jap troops in India advance to within 80 miles of Dimapur.

In the southwest Pacific U.S. bombers raid Wewak, New Guinea, and meet no enemy opposition.

6th U.S. planes from Britain bomb the Pas-de-Calais area and airfields of France.

Allied air commando forces destroy 35 Jap planes in 6 minutes at Aungbin in India.

7th U.S. heavy bombers raid Wake Island for the 18th time.

Allies in Italy repulse German thrust south of Aprilia and Anzio with heavy enemy losses.

8th Red Army pushes the Nazis back to the frontiers of Czechoslovakia.

1,000 U.S. heavy and medium bombers raid aircraft plants in Brunswick and north of the Ruhr in Germany.

9th Large forces of Flying Fortresses and Liberators accompanied by 1,000 fighters bomb northeast Germany and Poland. Shoot down 20 planes; 31 bombers and 8 fighters fail to return.

10th U.S. and R.A.F. fliers make 2,600 sorties to attack airplane plants, airfields and communication lines in northern France and Belgium.

Jap troops penetrate 50 miles into India below Imphal to reach Bisbenpur.

11th U.S. and British planes raid aircraft plants at Oschersleben, Bernburg, Rastook and Arnimswalde, Germany. Shoot down 126 planes. U.S. loses 64 bombers and 16 fighters. R.A.F. loses 22.

U.S. destroyers raid the Jap base at Hansa Bay, New Guinea.

U.S. forces occupy 4 more atolls in the Marshalls.

12th Red Army captures Tiraspol and advances 43 miles toward the Crimean naval base at Sevastopol.

13th Approximately 3,000 planes from Britain and Italy bomb Germany, Hungary, Belgium, France and Yugoslavia.

750 U.S. bombers with an escort of 1,100 fighters raid airplane plants at Augsburg and Oberfaffenhofen and bomb other targets at Schweinfurt and Lechfeld. Destroy 134 planes; lose 58.

U.S. planes from Italy bomb Brod, the German tank headquarters in Bosnia.

Red Army captures Simferpol, the capital of the Crimea.

14th R.A.F. Mosquitos raid Berlin and U.S. Thunderbolts hit targets in northern France.

Australian troops capture Bogadjim, a defense outpost for Madang in New Guinea.

U.S. Liberators make heavy attack on 5 key islands of the Truk atoll.

15th Red Army captures Lyubimouka and advances within 3 miles of Sevastopol.

U.S. fliers from Italy aid the Russians by bombing Bucharest, the Rumanian capital.

U.S. fighter planes from England raid 10 airfields in Germany and Western Europe. Destroy 18 planes; lose 30 fighters.

16th U.S. detachment penetrates 2½ miles into German lines behind the Anzio beachhead and returns with 60 prisoners.

Allied troops in India gain full control of the Imphal plain.

17th U.S. patrol advances 2 miles into German lines behind Anzio beachhead and blows up an ammunition dump.

Marshal Badoglio and his ministers resign.

18th About 1,000 U.S. bombers raid Berlin and nearby plane factories. Shoot down 13 planes and destroy an untold number on the ground. We lose 18 bombers and 6 fighters.

Allied planes from Britain pound the Pas-de-Calais area and targets in northern France and Belgium.

Russian troops close in on Sevastopol from 3 directions.

U.S. fliers continue their unceasing attacks on Jap held islands in the Pacific.

19th More than 2,000 U.S. planes pound the Pas-de-Calais area and the Netherlands. Destroy 21 planes and lose 6.

Allied troops in Italy repulse 4 German attacks on the Anzio beachhead below Aprila.

A British-Indian bayonet charge on the heels of a point blank artillery barrage break the Jap siege of Kohima on the India side of the Burma border.

20th Powerful Allied fleet including everything from battleships to submarines attacks the northwest top of Sumatra in the heart of Japan's Asiatic defenses.

U.S. planes bomb Timor in the Indies and Netherland New Guinea.

8th U.S. Army Air Force makes large daylight raid on western Europe. Loses 9 heavy bombers.

21st R.A.F. drops a record of 5,040 tons of bombs on Cologne and Paris. Loses 16 planes.

Allied fliers in Italy make 2,000 sorties to bomb targets around Venice, Trieste and Florence.

Allied forces in India push the Japs back 30 miles from Imphal.

22nd U.S. troops capture 2 more atolls, Erikub and Aur, in the Marshall Islands.

MacArthur's forces land along a 150-mile front in New Guinea. Troops land at Aitape and Hollandia and consolidate positions. Traps an estimate of 30,000 Jap troops on New Guinea.

23rd 1,500 U.S. and British planes batter 7 air bases in northern France and Belgium.

24th More than 2,000 U.S. planes raid aircraft plants in Friedrickshafen and airfields in the Munich area. Shoot down 103 planes, lose 38 bombers and 17 fighters.

U.S. Air Commandos land glider-borne reinforcements 200 miles inside Burma in an attack on Jap communications.

25th Allied fliers continue to smash airfields and communications centers along the invasion coast.

U.S. troops occupy Ujelang in the Marshalls.

26th MacArthur's forces continue successful advances along the entire New Guinea front.

U.S. bombers attack Paramushiru, Shimushu, and Matsua Islands in the Northern Pacific.

1,000 U.S. planes bomb targets in Western Europe without losing a plane.

U.S. infantry, preceded by 5,000-shell barrage, gain important ground around Carano and on the Anzio beachhead.

27th Allied air might continue attacks on military targets in France and Germany.

Allied troops capture the last airfield around Hollandia.

28th 3,000 Allied planes drop 10,000 tons of bombs on German targets in northern France.

China confirms the loss of Chengchow to the Japs.

Allied fliers bomb airfields on Wewak.

Frank Knox, secretary of Navy, dies of heart attack.

29th U.S. planes bomb Toulon, and railroads in central Italy.

In last 18 days Russia sank 92 Nazi escape vessels off the southern Crimea.

30th In April our 8th Air Force dropped 24,000 tons of bombs and destroyed 1,300 German planes.

For Heroism and Service

CONGRESSIONAL MEDAL OF HONOR

SGT. JOSE CALUGAS. After a battery gun position on Bataan had been put out of commission on 16 Jan 42, he organized a crew, put the gun back in operation, and fired effectively against the enemy. Sgt. Calugas is now a prisoner of war of the Japanese.

OAK LEAF CLUSTER, DISTINGUISHED SERVICE MEDAL

MAJ. GEN. FRED C. WALLACE, for exceptionally meritorious and distinguished services in the performance of duties of great responsibility as Commanding General, Fifth Service Command, from 2 Jul 42 to 15 Sep 43. Gen. Wallace was in command during the reorganization of the Fifth Service Command, and the success of that reorganization is directly attributable to his wisdom, energy and inspiring devotion to duty. Gen. Wallace was largely responsible for the efficiency and effectiveness with which the Fifth Service Command performed important service functions to all agencies of the Army Ground Forces, Army Air Forces, and Army Service Forces located within the territorial limits of his command. (Gen. Wallace's services during the World War were recognized by the award of the DSM for exceptionally meritorious and conspicuous services as inspector-instructor for the Chief of Field Artillery from 16 Apr to 16 Oct 1918.) Address, 12 W. Read, Baltimore, Md.

DISTINGUISHED SERVICE MEDAL

MAJ. GEN. JOHN P. LUCAS, for assuming command of a Corps immediately after the establishment of the Salerno bridgehead, he directed and executed the corps advance over rugged mountain terram and across formidable river barriers. During this time the active operations of his command as part of the Fifth Army included a drive through roadless mountain passes to the key city of Avellino, a rapid advance beyond the Calore River to threaten the enemy flank, and a brilliantly executed crossing of the Volturno River in the face of determined enemy oposition. His tireless energy and superior leadership inspired the corps to a consistently vigorous attack on opposing German forces. Although seriously handicapped by adverse weather conditions, inferior road networks and an ever lengthening line of supply, he demonstrated remarkable ability and a comprehensive military knowledge in surmounting each succeeding obstacle. By his sound foresight, judgment, application of thorough professional knowledge and unselfish devotion to duty he has contributed materially to the success of the corps and to Fifth Army operations in Italy. His personal courage, practical skill and calm resolution have been an inspiration to the officers and men of his command and have made his services of outstanding value to his country.

BRIG. GEN. LESTER J. WHITLOCK, for exceptionally meritorious service to the Government in a position of great responsibility from 18 Apr 42 to 1 Sep 43. Upon the establishment of General Headquarters, Southwest Pacific Area. Brig. Gen. Whitlock (then Col.) was assigned as Assistant Chief of Staff, G-4, and was charged with the critical task of coordinating all supply activities in the theater. Already acquainted with the situation through three months' service in the United States Army Forces in Australia, he attacked the numerous and complicated problems involved, with great energy. Transportation, supply, quartering, hospitalization and evacuation were rapidly and soundly organized as the basis for early containing of the offensive. By exercise of his broad experience, initiative, foresight and capacity to enlist the cooperation of our Allies. Gen. Whitlock was notably successful in this arduous and complex task of organization and planning, thus making a most important contribution to military operations in the Southwest Pacific Area. Address, 330 Glendale Ave., Findlay, Ohio.

LEGION OF MERIT

MAJ. GEORGE M. BALDWIN, for exceptionally meritorious conduct in the performance of outstanding services in New Guinea from 29 June to 14 Sep 43. Maj. Baldwin, commanding an artillery battalion, found it necessary as the result of the activities of an enemy raiding force concentrated in his battalion area, to convert part of his troops to Infantry to ward off repeated attacks. With clearheaded thinking and cool, deliberate organization hestablished his defenses according to plans based on previous extensive personal reconnaissance of the area in anticipation of such an attack. Although ill, he refused to be evacuated, and successfully directed his men in repulsing all attacks by the enemy. Meanwhile, his firing batteries continued to deliver all artillery fire called for. Maj. Baldwin's personal example was an inspiration to his command, and his splendid leadership was responsible for defeating all enemy attacks. Address, 2946 NE 33d Ave., Portland, Oregon.

COL. PHILLIP W. BOOKER, for exceptionally meritorious conduct in the performance of outstanding service. As Director of the Operations Division of a port of embarkation he was responsible for the movement of troops into the port area; for the proper equipment and condition of troops passing through the port; for the proper arming of troop transports; and for the procurement and training of crews for the protection of these transports. His force and zeal in the performance of these duties and his tact and diplomacy in dealing with representatives of allied nations contributed materially to the war effort of this country in the movement of troops and supplies overseas. His sound judgment and determination to accomplish the desired end made possible the success of many intricate problems in troop movement, and his conduct was an inspiration to all with whom be came in contact. Address, Hampton, Va.

COL. ABBOTT BOONE, for exceptionally meritorious conduct in the performance of outstanding service. As Chief, Overseas Supply Division of a port of embarkation, Col. Boone conducted the initial establishment and organization of this division for the supply of troops. The efficiency of the operation of this division, manifested by prompt shipment of supplies to troops in the combat areas, contributed materially to the success of our tactical operations. Later, as commanding officer of another port of embarkation, he instituted organizational changes which contributed much to the increased efficiency of the port and its ability to meet requirements placed upon the port by the War Department. Col. Boone, in both of these important assignments, demonstrated exceptional organizational ability, great zeal and outstanding devotion to duty. Address. Tyler, Texas.

COL. PERRY W. BROWN, for exceptionally meritorious conduct in the performance of outstanding service as Assistant Chief of Staff, G-4, Alaska Defense Command, from 4 Apr 42 to 20 Jan 44. By his outstanding executive ability and untiring energy Col. Brown directed and developed the supply procedure for the Alaska Defense Command to a high degree of efficiency during a period that included active operation against the enemy and involved a rapid increase in the strength and area occupied by United States Troops. His ingenuity in developing supply and transportation methods and his skill in applying them to the functions of the G-4 office facilitated good planning and superior staff coordination at all times. The soundness of his foresight and judgment insured that troops in the Alaska Defense Command were promptly and adequately supplied. Address, Ames Hotel, St. Petersburg. Fla.

T/4 WILLARD R. BUTCHER, for exceptionally meritorious conduct in the performance of outstanding services. On 11 Sep 43 near Persano, Italy, the combat efficiency of the company unit had been seriously impaired by the loss of six tank destroyers in action with the enemy. The following morning Tech. Butcher and another member of his section undertook to recover the disabled vehicles. In the face of artillery and small arms fire they successfully recovered four tank destroyers. By this courageous action, combined with superior technical skill, they were able to restore to action within a short time armament which was critically needed. Tech. Butcher's initiative and devotion to duty assisted his battalion materially in the successful completion of its mission. Address, Route 3, Henning, Minn.

T/5 WILSON O. CHENEY, for exceptionally meritorious conduct in the performance of outstanding services. He operated a radio for the headquarters of an Armored Field Artillery battalion at Maknassy, Tunisia, from 28 Mar to 1 Apr 43. Although radio communication was difficult, he was able to use his radio as a relay station to the Battalion Fire Direction Center and stayed at his post for four days continuously with practically no relief. During much of the time enemy mortar and artillery fire fell near his station. On 10 Jul 43 he proved himself most outstanding during the landings at Licata, Sicily. He carried his radio ashore under heavy enemy machine gun fire, and later in the day at an observation post he repaired the radio which had been damaged. This enabled the forward observer to accomplish his mission. His devotion to duty and spirit of service were an inspiration to all who saw him. Address, Tebbets, Ind.

LT. COL. RALPH E. COLE, for exceptionally meritorious conduct in the performance of outstanding services from 15 Mar to 26 Jul 1943. As liaison officer from an Infantry division to the Australian New Guinea Force Headquarters, he performed conspicuously effective service. His foresight, keen judgment and energy resulted in excellent relations between the Australian and American forces in New Guinea. Tactical operations were greatly facilitated through his fine work of coordination. In addition, he arranged for the supply of fresh meat, fruit, and vegetables by air to forward areas in New Guinea. He established and maintained a casual company for reception and care of division troops. On all these duties, he attained an unusually high standard of efficiency, and the results of his work have been of utmost value to his division. Address, 316 Hyat Ave., Del Monte, Calif.

COL. HUGH CORT, for exceptionally meritorious conduct in the performance of oustanding service as G-4 from 25 Mar 42 until 6 Jun 42, and as Chief of Staff, 77th Infantry Division, from 6 Jun 42 until 3 Jun 43. As

G-4, his energy, initiative, tact and attention to duty were responsible for the successful initial supply of his organization. Much of the success of the division is due to Col. Cort's sound judgment, foresight and loyalty as Chief of Staff. The 77th Infantry Division was the first division to be organized under the cadre system now in effect and the first training division to carry out the Mobilization Training Program. There was no established precedent to follow, and standing operating procedures as to tactics, troop movements, intelligence, training and supply were developed by the Division Staff under the supervision of Col. Cort. Address, 22 Tuxedo Ave., San Antonio, Texas.

M/SGT. CHESTER A. DEMICK, for exceptionally meritorious conduct in the performance of outstanding services. As Communications Chief, Hq. and Hq. Battery of an Infantry Division Artillery, he skillfully supervised the installation and maintenance of communications between Division Artillery and the Artillery battalions from 8 Nov 42 to 8 May 43. Under the most discouraging conditions of battle, he consistently performed in a superior manner his duties, which were vital to the combat efficiency of Division Artillery. By his unfailing effort, outstanding ability and aggressive leadership, he overcame all difficulties such as extremely long lines, difficult terrain, foul weather, hostile enemy operation and fire. The qualities of leadership and ability exhibited by him were an inspiration to his men and contributed substantially to the successful operation of the Division Artillery throughout the campaign. Address, 262 S. Winooski Ave., Burlington, Vt.

T/3 JACK FOISIE, for exceptionally meritorious conduct in the performance of outstanding services from 22 Jun to 18 Aug 1943. As a correspondent for the Army newspaper *Stars and Stripes* his assignment was to cover the Sicilian campaign, initially with an Airborne Division and then with the Ground Forces. His news coverage of this campaign was acclaimed by civilian correspondents as outstanding. His ability and determination in carrying out his assignments were exemplified by his action on 8 Aug 43, with the American forces advancing along the coast of Northern Sicily. He was the only correspondent to accompany the American forces on this spectacular amphibious operation which resulted in the capture of Santa Agata. Address, 5 Tanglewood Rd., Berkeley, Calif.

LT. COL. WILLIAM D. HAWKINS, for exceptionally meritorious conduct in the performance of outstanding services in New Guinea from 10 Dec 42 to 22 Jan 43. Col. Hawkins served as executive officer for the section and later as Acting Assistant Chief of Staff, G-2, for the Buna Forces. He rendered valuable service in effecting and maintaining the closest liaison with Australian elements engaged in the operations, which resulted in the acquisition of much useful and timely information concerning enemy troop dispositions, dumps and gun emplacements. His efficient organization and administration of the section, as well as his personal work on daily periodic reports and the evaluation and dissemination of enemy information contributed greatly to the success of the campaign. Working long hours under trying conditions, Col. Hawkins rendered a conspicuous service during these critical operations. Address, 2 Normandy Rd., Bronxville, N. Y.

BRIG. GEN. GEORGE V. KEYSER, from 1 Nov 40 to 11 Jun 42, in the capacity of instructor and later Director of the Department of Gunnery, Field Artillery School, Ft. Sill, Okla, he directed the research and experimentation which resulted in the present fire technique. He simplified gunnery technique and stressed the forward observer methods, use of photos and photomaps and simplification of survey method. Address, 611 Houston St., Manhattan, Kans.

1ST LT. DUDLEY E. H. KIERULFF, for exceptionally meritorious conduct in the performance of outstanding services as an artillery forward observer during the Tunisian and Sicilian campaigns. Lt. Kierulff in his ceaseless, untiring and courageous efforts to destroy enemy installations was an inspiration to all with whom he came in contact and was responsible for inflicting severe losses upon the enemy. In Sicily his deadly direction of artillery fire forced the enemy to evacuate a strong point and was a decisive factor in breaking the northern German positions around Troina. Address, 2955 Avalon Ave., Berkeley, Calif.

CPL. JOHN W. LANSING, for exceptionally meritorious conduct in the performance of outstanding services during the Tunisian and Sicilian campaigns. As instrument operator, recorder and computer at his battery gun position, Cpl. Lansing distinguished himself by the skillful manner in which be performed his duties. His work was made particularly difficult by the rapidly changing situation, mountainous terrain and enemy action, but in spite of the 100 times his battery occupied different firing positions, firing over 300 fire missions, with concentrations often fired close to friendly troops. he never permitted a piece to fire with an incorrect setting. By his skill and diligence be performed a most conspicuous service in battle and won the admiration of all members of the command. Address, Pueblo, Colo.

S/SGT. JOHN C. LASHER, for exceptionally meritorious conduct in the performance of outstanding service as Chief of Ammunition Section of a service battery during the Tunisian and Sicilian Campaigns. The coordinated movement of ammunition vehicles under fire, across country over unfamiliar terrain and in blackout was accomplished in a most superior manner under his supervision and control. Perfecting a new plan for hauling ammunition which far excelled the original method in practicability, no obstacles imposed either by the enemy or by nature prevented his timely arrival with additional supplies of ammunition. At all times his battalion commander was secure in the knowledge that no matter how much ammunition was expended, Sgt. Lasher, with his trains, would maintain an adequate supply on hand. Through his judgment, initiative and foresight he gained the complete confidence and admiration of his men, which was responsible for the perfection with which that section carried out its duties. Address, Huntingburg, Ind.

LT. HARRY W. McDANIEE, for exceptionally meritorious conduct in the performance of outstanding service. As battalion forward observer, he was so successful in the training of his section that he was placed in charge of all battalion observation sections, coordinating their work throughout the Tunisian Campaign. On many occasions he established his observation posts under enemy small arms, mortar and artillery fire in advance of Infantry units, thus assuring peompt Artillery support. Upon completion of the Tunisian Campaign he was assigned to command the battalion headquarters battery. Under his energetic leadership the company was reorganized, the replacements for battle casualties were quickly trained and the battery entered the Sicilian campaign at peak efficiency. Address, 112 S. Hill St., Oceanside, Calif.

COL. JOHN P. RATAY, for from 8 Nov 42 to 29 Dec 43, as Executive and Commanding Officer of the Atlantic Base Section, North African Theater of Operations, he rendered vital services during its organization and expansion. Through his efforts the construction of vital medical and supply installations, port facilities, etc., was carried out systematically and in a remarkably short time. Under his supervision plans were formulated and executed for the supply of tactical troops in the area with the result that their needs were met with little confusion or delay. Cordial relations with French military establishments and civilian communities were established and maintained by his superior judgment and tact.

S/SGT. DOM P. RUFF, JR., for exceptionally meritorious conduct in the performance of outstanding service. As gunner corp. from July 1941 to May 1942, he established an enviable record for accuracy in following fire commands. On 6 May 42 he was promoted to sergeant and chief of a howitzer section, in which position he deevloped the outstanding gun crew in the battery. During the Tunisian and Sicilian campaigns, because of the speed and accuracy which he had deevloped in his section, his howitzer was used as adjusting piece, and on night marches his section was normally designated lead section because of his excellent judgment and dependability. Address, 903 N. State St., Jackson, Miss.

COL. WILLIAM T. SEXTON, for rendering services of great importance to the Army of the United States in the position of Secretary of the War Department General Staff from 14 Mar 43 to 14 Jan 44. His thorough professional background, his sound judgment, and his executive ability are reflected in the high standards he maintained in the general administration of the Office of the Chief of Staff and in the coordination of the activities of the General Staff during the critical period when vast Allied operations were being mounted. He possessed a keen conception of the complexities and importance of the intimate relationship of the Army and the people of the Nation and performed his exacting duties with extreme loyalty, enthusiasm and high purpose.

CAPT. WALTER H. SKIELVIG, for exceptionally meritorious conduct in the performance of outstanding services in New Guinea from 3 Jan to 25 Jul 43. Serving as Aide-de-Camp to the Commanding General of an Infantry Division, Capt. Skielvig efficiently accomplished many arduous tasks assigned to him beyond the normal duties of an Aide-de-Camp. He planned and constructed with native labor in a forward area a divisional headquarters of over 40 huts. He later surveyed and initiated construction on substantial sections of a vital supply road, including several temporary bridges, to expedite the opening of the road. With marked versatility, he accomplished in a superior manner many other tasks assigned to him. Capt. Skielvig's ability and energy enabled him to make a substantial contribution to the activities of his division. Address, 1755 Interlaken Blvd., Seattle, Wash.

LT. COL. JOHN W. SMILEY, for exceptionally meritorious conduct in the performance of outstanding services from 18 Sep to 15 Nov 43. After the departure of a division for Italy, he was left as commanding officer of headquarters base echelon of an Airborne Division, with rear echelons of 17 units dispersed at 11 widely separated points in Sicily and Africa, along with all the organizational equipment, supplies and personal effects of troops. He prepared and executed plans for the concentration and organization of personnel and materiel, and for the air movement of increments of both to forward areas when and as required. This was accomplished with outstanding efficiency, exceptional tact and administrative ability. He then coordinated the efforts of the combined base echelons, displaced them to Algiers and Bizerte and prepared them for a seaborne movement to another station. These highly successful achievements, involving dispersed elements, air, water and ground movements, displacement of the base and innumerable other tasks and problems not encountered by Ground Forces, were due solely to the foresight, professional ability and wholehearted devotion to duty displayed by Col. Smiley. Address, 515 E. 12th St., Bonham, Texas.

COL. KENNETH S. SWEANY, for exceptionally meritorious conduct in the performance of outstanding services in New Guinea from 1 June to 17 Sep 43. As Chief of Staff of an Infantry division Col. Sweany made initial plans, coordinated movement of the troops of a task force and organized and maintained a steady flow of ammunition, supplies and equipment. His personal supervision of this task brought him into forward areas, frequently under fire, occupying foxholes and weapons positions, where his presence encouraged the men and inspired them by his example. He constantly maintained personal liaison between base and forward troops to ensure the movement of vital supplies, assisted in formulating plans of attack for the force and made personal reconnaissance of the landing beach from Tambu Bav to Salamaua. Col. Sweany's careful planning, tireless energy, devotion to duty and exceptional qualities of leadership were in large measure responsible for the success with which the problems arising from overextended lines of communication

and supply were overcome, and had great bearing on the success of our operations. Address, RR3, Oswego, N. Y.

S/SGT. ROSCO C. VAUGHN, for exceptionally meritorious conduct in the performance of outstanding services. On 11 Sep 43 near Persano, Italy, the combat efficiency of the company unit had been seriously impaired by the loss of six tank destroyers in action with the enemy. The following morning S/Sgt. Vaughn and another member of his section undertook to recover the disabled vehicles. In the face of artillery and small arms fire they successfully recovered four tank destroyers. By this courageous action, combined with superior technical skill, they were able to restore to action within a short time armament which was critically needed. Sgt. Vaughn's initiative and devotion to duty assisted his battalion materially in the successful completion of its mission. Address, Route 2, Grenville, N. M.

COL. JAMES R. WHEATON, for exceptionally meritorious conduct in the performance of outstanding services as Executive Officer of an Occupation force from 1 May 43 to 24 Oct 43. During this period, Col. Wheaton demonstrated exceptional ability, initiative and leadership in organizing and supervising an efficient staff group which prepared the plans for the occupation of an advance Aleutian Base and Later the development of the project. This he did by his zeal and devotion to duty over long hours beyond the normal call of duty. His superior service is reflected in the high regard and trust in which he is held by his superior officers. Address, Ionia, Mich.

SILVER STAR
(Posthumously)

LT. COL. LEROY C. DAVIS, for gallantry in action in the vicinity of Ousseltia, Tunisia, 31 Jan 43. Despite a heavy enemy artillery barrage, he courageously proceeded over uncharted enemy mine fields and successfully established a forward observation post. His unselfishness, superior leadership and outstanding gallantry at the cost of his life merit the highest praise. Address (widow) 800 Sherman St., Watertown, N. Y.

OAK LEAF CLUSTER, SILVER STAR

LT. WILLIAM J. BARTLETT, for gallantry in action near Gela, Sicily, 10 Jul 43. During landing operations, he skillfully established and maintained communications with supporting warships, despite determined enemy resistance. His accurate adjustment of naval gunfire materially aided our forces in repelling an enemy counterattack. Address 17 Huntington St., Brooklyn, N. Y.

LT. MERTON D. CALDWELL, for gallantry in action near Gela, Sicily, 10 Jul 43. During landing operations, he skillfully established and maintained communications with supporting warships, despite determined enemy resistance. His accurate adjustment of naval gunfire aided our forces in repelling an enemy counterattack. Address, 11 Queensbury St., Boston, Mass.

SILVER STAR

1ST SGT. CHARLES R. BAKER, for gallantry in action at Tambu Bay, New Guinea, on 29 Jul 43. Address, 5222 SE Woodstock, Portland, Ore.

PVT. JAMES G. CASSELL, for gallantry in action near Gela, Sicily, 11 Jul 43. Displaying outstanding courage and coolness in the face of incessant enemy dive-bombing and artillery action, be continued directing military traffic, although painfully wounded. His intrepidity and initiative under withering fire prevented dangerous congestion and facilitated our advance. Address, Cuttingsville, Vermont.

T/5 JOHN L. DEAL, for gallantry in action in the successful evacuation of an armored Field Artillery Bn. command post in Italy. Cpl. Deal volunteered to run a 100-yard gauntlet of fire to recall three of the forward observer tanks, successfully completing his mission. Address, 3714 El Monte Way, Fresno, Calif.

T/4 EUGENE O. DURAND, for gallantry in action near Mount Tambu, New Guinea, 30 Jul 43. Address, Hall, Montana.

PVT. 1ST CLASS JOSEPH V. FABIANO, for gallantry in action at Tambu Bay, New Guinea, on 30 Jul 43. Address, 380 Addison Ave., Palo Alto, Calif.

PVT. 1ST CLASS WALDEMAR W. HAUSSLER, for gallantry in action at Tambu Bay, New Guinea, on 29 Jul 43. Address, RR1, Holbrook, Nebraska.

CPL. BERNARD A. JOHNSEN, for gallantry in action at Tambu Bay, New Guinea, on 13 Aug. 43. Address, 444 Colon Ave., San Francisco, Calif.

T/5 ERNEST JONES, for gallantry in action near Troina, Sicily, 4 Aug 43. He voluntarily left his place of safety, fearlessly crossed terrain under direct enemy observation and heavy fire and recovered an immobilized vehicle. His courage and initiative in preventing the loss of irreplaceable equipment merit the highest praise. Address, R.F.D. 3, Charleston, Mo.

S/SGT. OSCAR E. KLAAS, for gallantry in action at Tambu Bay, New Guinea, on 29 Jul 43. Address, 1518 S. 57th St., Tacoma, Wash.

SGT. ALBERT KOVACS, for gallantry in action near El Guettar, Tunisia, 23 Mar 43. When an exploding enemy shell buried an enlisted man in his foxhole and set fire to several rounds of 105-mm ammunition nearby, he entered the gun pit in an unsuccessful attempt to rescue the imprisoned man but was forced to withdraw by exploding ammunition. His bold action merits the highest praise. Address, 108 Fly Ave., S. Norwalk, Conn.

LT. JOHN P. LAMB, for gallantry in action near Sperlinga, Sicily, 27 Jul 43. When heavy enemy fire prevented an infantry company from advancing, he left a place of comparative safely, located an excellent observation post and proceeded to direct accurate artillery fire on enemy strongholds. He remained in this exposed position, despite determined enemy resistance, until the infantry had reached its objective. Address, Cedar City, Utah.

CAPT. WILSON V. LEDLEY, for gallantry in action near Gela, Sicily, 10 Jul 43. During landing operations, he skillfully established and maintained communications with supporting warships, despite determined enemy resistance. His accurate adjustment of naval gunfire materially aided our forces in repelling an enemy counterattack. Address 126 Green Ave., Brooklyn, N. Y.

S/SGT. FREDERICK B. LOTSPEICH, for gallantry in action at Tambu Bay, New Guinea, on 30 Jul 43. Address, RR1, Selah, Wash.

T/SGT. THADIEUS LUKASEWSKI, for gallantry in action near El Guettar, Tunisia, 25 Mar 43. When informed that a 105-mm how, had been destroyed and acting entirely on his own initiative, he proceeded to the rear to obtain a replacement. Although the route was subjected to heavy enemy shell and small arms fire, he successfully delivered the weapon. His bold action aided materially in repulsing a strong enemy attack. Address, 7 Ames Ave., Terryville, Conn.

CPL. THEODORE T. MADEY, for gallantry in action at Tambu Bay, New Guinea, on 30 Jul 43. Address, 1125 S. Beatrice, Detroit, Mich.

MAJ. ROLAND J. MEEKER, for gallantry in action in the successful evacuation of an armored Field Artillery Bn. command post in Italy. Under Maj Meeker's leadership the battalion completed the movement with relatively few casualties while under constant fire from the forward enemy artillery. Maj. Meeker continually exposed himself for more than three hours directing the operations and overseeking the care of the Battalion's wounded. Address, 1627 Short St., Ft. Wayne, Ind.

PVT. 1ST CLASS CECIL MEREDITH, for gallantry in action at Tambu Bay, New Guinea, on 29 Jul 43. Address, Clarksfork, Idaho.

S/SGT. JOE MILAM, for gallantry in action near Troina, Sicily, 4 Aug 43. A vehicle was immobilized by a heavy enemy barrage. Despite harassing enemy artillery and small arms fire, he proceeded to the wounded driver's rescue and successfully evacuated him. His display of coolness and quick thinking were a credit to his organization. Address, 416 Court St., Charleston, W. Va.

CAPT. HENRY E. MITCHELL, for gallantry in action near Sbeitla, Tunisia, 17 Feb 43. During an engagement with a numerically superior enemy, and accompanied by two platoons, he destroyed many enemy tanks. When his own armored vehicle was demolished by direct enemy tank fire, he courageously continued his attack on foot until the enemy was successfully repulsed. Address, 404 University Blvd., Daytona Beach, Fla.

PVT. 1ST CLASS HECTOR G. MOREAU, for gallantry in action near El Guettar, Tunisia, 28 Mar 43. When a wire line from his battery's gun position to an observation post was servered by enemy fire, he voluntarily proceeded under heavy artillery and mortar fire and repaired the broken line. His courage and coolness in the face of grave personal danger enabled the prompt restoration of vital communications. Address, 55 Crossman Central Falls, Penna.

PVT. 1ST CLASS CLAIR S. MUMBAUER, for gallantry in action in the successful evacuation of an armored Field Artillery Bn. command post in Italy. Pvt. Mumbauer, driver for the battalion commander, remained with him during the entire action. He ran errands afoot and made numerous trips in the Commander's car between the two positions. Address, Quakertow Penna.

LT. COL. BEVERLY E. POWELL, for gallantry in action in the successful evacuation of an armored Field Artillery Bn. command post in Italy, when the Germans pocketed it with heavy artillery fire from two directions. Col. Powell, from a place of comparative safety, entered the line of fire to determine the source and direction of the enemy fire. Locating the guns on the flank, he called for a volunteer to run a 100-yard gauntlet of fire to recall three of his forward observer tanks. Adress, 2121 S. F St., Ft. Smith, Ark.

PVT. EDISON C. RICHARDS, for gallantry in action near El Guettar, Tunisia, 30 Mar 43. He voluntarily proceeded under heavy machine gun, mortar, and small arms fire to establish an artillery observation post in advance of the foremost infantry elements. His successful accomplishment of this mission assured close artillery support and facilitated the advance of the infantry. Address, Norris, S. D.

LT. EDWARD L. ROSS, JR., for gallantry in action at Roosevelt Ridge. New Guinea, on 2 Aug 43. Address, Box 5, Aloha, Oregon.

SGT. ANTHONY P. STASIECZKO, for gallantry in action near El Guettar, Tunisia, 30 Mar 43. Displaying excellent qualities of leadership, he led his liaison section over exceptionally hazardous terrain subject to continuous enemy machine gun, mortar and small arms fire, and established an observation post well in advance of our foremost infantry elements. His bold actions enabled the delivery of effective artillery fire and permitted the infantry to resume its advance. Address, R.F.D. 2, Mt. Tabor, N. Y.

SGT. JOHN A. SURETTE, for gallantry in action near Troina, Sicily, 3 Aug 43. He fearlessly proceeded over terrain swept by enemy machine gun and small arms fire to repair and maintain essential communications. His daring and beavery materially contributed to the Infantry's advance. Address, 36 Lamson St., East Boston, Mass.

BOOK REVIEWS

HOW TO THINK ABOUT WAR AND PEACE. By Mortimer J. Adler; foreword by Clifton Fadiman. 301 pages; bibliography. Simon and Schuster. $2.50.

Much is being talked and written about the "peace" to follow World War II, and in the nature of the case a large part of this unstinted expression is superficial. Much of our thinking on the subject is geared to short range motives of self interest or at best of national interests. The compromise habit of accepting as peace the varying, uncertain periods between wars is a heritage from all past generations.

Mortimer Adler has challenged these restricted, age-old habits of thought, and has introduced to his readers a cautiously qualified proposition that perpetual peace is attainable. He does not convey the idea that it is immediately or easily attainable, but he leads convincingly to his conclusions through a thoughtful examination of war, peace, and the human society.

The author's treatment of the subject is in the austere manner of the philosopher, a fact which sets his book apart from the more glib and casual discussions on the general topic of the postwar world. Such an objective as he has proposed must assume support in a high degree of popular integrity and social intelligence. The author has taken account of this fact by including reform, revolution, and education in the factors for promotion of eventual peace.

Clifton Fadiman's foreword, "A Plea to the Reader," is a foreword only in the mechanical sense that in the arrangement of the book it precedes the main text. It is truly a plea that this "hard book" be read thoughtfully because ". . . . it deals with survival, perhaps yours or mine, but certainly the survival of civilized man." F. E. J.

HISTORICAL ATLAS OF THE UNITED STATES. By Clifford L. Lord and Elizabeth H. Lord. 207 pages; appendices; index. Henry Holt & Co. $3.00.

Educators have long known that history was a cold, difficult subject unless taught with the aid of maps. Social and economic aspects of history are being emphasized increasingly. Something more than conventional political maps are required. The Director of the New York State Historical Association has taken a long step toward filling that need.

Over 300 maps have been developed to tell a rounded story of our country's astounding growth from colonial days to the present. Many are in relief, others are in outline form. Following a group of general maps delineating our nation's basic resources and characteristics, three periods of our history are given comprehensive treatment: the colonial period, 1775-1865, and 1865-1941. Realizing that our problems as a world power can not be assessed without consideration of the resources and potentialities of nations throughout the war, Mr. Lord also includes a group of world maps. Statistical information is confined to the six appendices. A comprehensive index greatly adds to the volume's general usefulness.

Highly valuable for reference purposes, this historical atlas is designed to supplement other teaching material in school courses. It is ideal for continuing use, from initial grade-school classes through advanced work. Americanization and orientation schools can make good use of it, too.

ILLUSTRATED TECHNICAL DICTIONARY. Edited by Maxim Newmark. 340 pages; appendix. The Philosophical Library. $5.00.

This dictionary is so comprehensive, plainly written, and clearly illustrated that it is as useful in one's reference library as it is to teachers and their students. Its purpose is "to supply a wide and representative selection of officially approved, standard definitions promulgated by various United States engineering, technical, trade and industrial organizations, as well as by government agencies." This it appears to do well.

To enhance the value, an appendix contains American standard abbreviations, units of weight and measure, temperature interconversion tables, a table of chemical elements, and geometrical shop data. Thus the book is of considerable help to the vocational student, or to one working in technical fields as his hobby.

A SHORT HISTORY OF AMERICAN DEMOCRACY. By John D. Hicks. 859 pages; index; illustrated. Houghton Mifflin Co. $5.50.

Out of diversity has come a unity, "Americans." Although our ancestors spoke all languages and hailed from all parts of Europe, regardless of when they came to this country they had one thing in common—they were pioneers. Some opened the Eastern seaboard, others helped push steel rails across the plains, the latest arrivals helped change us from a rural to an urban majority. But all were pioneers.

These newcomers retained such of their old customs as still seemed appropriate here, but discarded the rest. Their common careers as pioneers developed their appreciation of life, liberty, and the pursuit of happiness; their conviction that the individual must be supreme over the state; their placing personal rights above those of property; their insistence that equality of opportunity must continue eternally. The "four freedoms" are not new at all.

Such is the belief of this book's writer, professor of history at the University of California. A good belief it is, too, and one which he rightly wants to pass along to all young Americans that they may be "more conscious of their nation's past, more able to understand its present problems, more fitted to help shape its course in the future."

His presentation should surely help them—and older Americans as well.

The sweep and interplay of our history resounds. There is no flag-waving, but a lucid, balanced account of the forces which have helped shape our nation. Many pages of illustrations, 48 maps, and line drawings and cartoons recapture the spirit of the periods and amplify the text. Footnotes are not dry references, but quite helpful suggestions for further reading on the points in question. All in all, this book is good as a refresher and stimulant as well as as a textbook.

MARK RIGHT! Tales of Shooting and Fishing. By Nash Buckingham. 196 pages; illustrated. G. P. Putnam's Sons. $2.50.

Nash Buckingham has lived the life many a man dreams about—most of it in or concerned with the out-of-doors. In the last 35 years he has become widely known through his articles in outdoor magazines and his 3 earlier books, of which *De Shootinest Gent'man* is the latest and probably most generally known. After building up a thriving sporting goods business in Tennessee, in the interest of wildlife conservation he became Western Cartridge's Director of Game Restoration. He has been connected with the American Wild-fowlers in Washington, and for eleven years has been an Associate Judge of the National Field Trial Champion Stake. And so on and on.

These activities spring from true interest on his part. Few writers write so clearly, cleanly, and sympathetically of their subjects—chiefly because they don't know them so well. But when Nash Buckingham speaks of blinds or of upland shooting, the *feel* is there. This collection of 15 tales is the ideal gift for anyone with the outdoors in his blood or who is nostalgic for the odor of pine smoke and all that should go with it.

BUREAUCRACY RUNS AMUCK. By Lawrence Sullivan. 318 pages. Bobbs-Merrill Co. $2.00.

Some say we have no bureaucracy, or, if we do, that we should hide our heads in the sand and hope for the best. Mr. Sullivan disagrees violently, as his title suggests. He presents startling figures. I didn't check 'em, but his publisher is an old firm of excellent reputation.

Regardless of the group to which you belong and regardless of your agreement or disagreement with Mr. Sullivan's thesis, you will find this book stimulating. The least to be said for it is that it does present a facet of our national life which frequently is just glossed over or otherwise ignored. B. H. W.

REPORT ON DEMOBILIZATION. By James R. Mock & Evangeline Thurber. 249 pages; index; illustrations. University of Oklahoma Press. $3.00.

The old saw that "we learn from history that we never learn from history" seems to be amply substantiated by this excellent book. It reports in considerable detail all the official and unofficial plans made by this country during and after World War I to demobilize industry and the armed forces in order to sail the S.S. *United States* into the troubled waters of Peace on something approximating an even keel. How the storm-tossed ship was almost wrecked offers a grim lesson to the navigators of World War II and World Peace II. The chapter on "Getting the Men Out of Uniform" is particularly interesting and important to those in service, for it gives a graphic picture of what we certainly don't want to happen this time.

The book summarizes the demobilization plans made from the Revolutionary War to the Spanish-American War. Little enough was done, but despite the inevitable postwar depressions, the vast open spaces to the west successfully absorbed the discharged soldiers and the war-weary citizens. In other words, nature took care of a problem that legislators couldn't or didn't want to face. This easy solution was all right as long as we had wide open spaces and could depend on something like the Homestead Act of 1862. By 1917, however, there were no more wide open spaces in the West so the "ten acres and a mule" idea of demobilization should have been discarded. But it wasn't, and the failure to discard it in favor of some practical plan led to 1929 and the Bonus Army.

This is a greatly simplified account of the authors' research. There were, of course, innumerable plans and ideas and projects proposed by the Congress, labor, business, and every other lobby and pressure group. For almost every plan a committee was established, but very

little of practical value was achieved since each group was looking out for its own interests and not those of the country.

The whole account is a pretty sorry one, but the pre-1929 boom and the present war boom seem to have eradicated the memories of the grim times we had after 1920 and 1929. Even the authors seem to forget that all planning and no action get nowhere, for in a rosy last chapter entitled "Blueprinting the Future" they attempt to show that "much more has been accomplished during this period of World War II than was attained" during World War I.

Actually, little of practical value has been achieved as we go into the third year of war. The blueprint and planning stage must finish very soon. We need to start building right now if we expect to have a roof over our heads when the postwar storm breaks. *Report on Demobilization* draws a lesson from World War I that we can't afford to neglect. R. G. M.

PACIFIC OCEAN HANDBOOK. By Eliot G. Mears. 188 pages; index; illustrated. James Ladd Delkin. $1.00.

In compact pocket size, *Pacific Ocean Handbook* is crammed with "must" information for those going to or interested in the Pacific theater. It is clearly written, easily read, and logically arranged. Besides describing the several major areas, Dr. Mears discusses the natural phenomena of the region: volcanoes and earthquakes, tides, currents, winds, temperature, precipitation, fogs and visibility, navigation, geomagnetism, etc., all in their Pacific aspects. In handy form the appendices tabulate data on area and population, navigation distances by water, airline distances, standard time, Beaufort wind scale on land and sea, visibility by altitude, food plants and jungle pests of Pacific islands, oceanic life, weights, etc., and chronology.

Over 60 illustrations amplify the text. Good sized fold-out maps, some of them prepared by *Time's* experts, are most helpful for familiarization or ready use.

Eliot Grinnel Mears is Professor of Geography and International Trade at Stanford University. He has written a number of volumes on his specialty, and in this latest book includes much up-to-the-minute information from various government departments. The net result is about the most useful book of its size yet published.

PACIFIC PARTNER. By George H. Johnston. 227 pages; endpaper map. World Book Company, distributed by Duell, Sloan & Pearce. $2.50.

An Australian's story of Australia might be expected to show some bias, and where the story has to do with the country's famous soldiers it seems only natural to expect some extraordinary, swashbuckling tales. In these respects *Pacific Partner* does not come up to expectations. It is instead a careful arrangement of un-accented facts introducing to America the "Terra Incognita" that is truly our valiant "Pacific partner."

With a history of scarcely more than a hundred years beginning with settlement largely by political prisoners from Britain, this "youngest national democracy" still has something of the freshness and the rugged, earthy quality of national youth. The author has found it strikingly similar to the United States in many respects, and has aroused a responsive feeling of psychological kinship by observing that Americans and Australians have the same sense of humor.

The soldiers, associated in the popular mind with somewhat exeggerated dash and color, are presented in realistic terms. There is no denying the fact that they are brave and hardy and even picturesque but they have had to swagger a bit to satisfy popular notions of their daring manner.

Pacific Partner is a particularly amiable book written in a hearty, fair-minded manner that is bound to promote closer acquaintance and further friendly respect between Australia and the United States.

F. E. J.

YOU AND YOUR CONGRESS. By Volta Torrey. 273 pages; index. Wm. Morrow & Co. $3.00.

This book by a journalist purports to be a resume of how a Democracy works—or does not work. As a layman's guide to how his Congress works, it describes "machines" and "pressure groups" and what part they play in our political scheme, and in that the book is instructive. Elsewhere the author seems to be at least biased.

The book tells of many things that are wrong with the working of our Democracy, but little that will help to clear away the fog. The

selfishness of special interest groups and the casualness of many Americans toward their duty to help in the running of their own country will continue to hamper us until selfishness and indifference are ruled out of the hearts of man by fidelity to duty. C. T. W.

U. S. S. R.: The Story of Soviet Russia. By Walter Duranty. 280 pages; appendix; index. J. B. Lippincott Co. $3.00.

U. S. S. R. is an enlightening book, which is to say it is a worthy achievement in its field. An author attempting to interpret Russia must make his points and arrive at his conclusions against a mighty clamor of previous—and often conflicting—accounts of this most astonishing of all countries.

Walter Duranty begins his book with a simple statement in necessary preparation for the pages that follow: "The first thing to know and understand and remember about Russia is that it is utterly different from the Western world, and that our standards of comparison cannot be applied to it."

Truly a comparison between Russia and the Western countries in their respective means of attaining national objectives would be hopelessly confusing. The violent thrusts, thunder, and blood by which Russia threw off czarist rule and arrived at its present condition were peculiarly its own. Its defiance of economic dogmas did not make sense to capitalistic countries but out of it has come an industrial transformation that commands the respectful attention of the whole world.

The U. S. S. R. is a product of national character in combination with geographic peculiarities and other more subtle forces of circumstance. Emerging, as the author says ". . . from the larval state of revolutionary pariah, through an indeterminate cocoon period . . ." it has come to occupy a place in world relationships that compels recognition even though its processes have not been understood.

F. E. J.

GERMANY: TO BE OR NOT TO BE? By Gerhart H. Seger and Siegfried K. Marck. 169 pages; appendices. Rand School Press. $2.00.

Gerhart Seger and Siegfried Marck are loyal to Germany—the "other Germany" of organized labor, scientific thinking, and of orderly social progress—the Germany that today is gagged and chained. The two authors have fought Hitler from the beginning, and have been thrown into concentration camps for it. They do not seek to whitewash Germany's errors and misdeeds, but they warn against too harsh treatment for the Germans after the war. They believe that those who must grapple with the difficult task of reeducating Germany must possess an intimate knowledge of German mentality, German history, German literature and philosophy. Of course there are two sides to this question of leniency, but as yet the opposition has brought forth no such convincing argument backed by authoritative history and philosophy as have Seger and Marck in their thought-provoking *Germany To Be or Not To Be*. Whatever one's own view on the subject may be, one cannot help giving credit to these two scholars who have endured so much for what they believe to be the right. M. E. M.

THE GERMAN ARMY. By Herbert Rosinski. 215 pp.; index. Infantry Journal. $3.00.

This revised edition of Rosinski's *The German Army* is for all practical purposes a new book, and an important one to military readers because the Germany army, by far the strongest our forces have to fight, is still a formidable foe.

The modern German army begins with Frederick the Great. "The thousand years of war and strife that preceded him, of glorious victories and terrible defeats . . . are history . . . they are no longer a living force, determining the structure and the spirit of the present German army . . . on the anvil of his battles . . . he forged . . . the spirit of a great tradition, the soul of an army . . . a mighty spiritual force not ignoble in its subordination and sacrifice of everything to one idea—duty."

Rosinski traces in the first part of the book the development of the German army through the reforms of Scharnhorst, the growth of the general staff under Moltke in the 19th century, the first World War, the work of Seeckt in the Weimar Republic, and finishes with the army of the Third Reich at the outbreak of the war

in 1939. The analysis of this development is very acute, but some mention at least of the relationship between the Nazi party and the army would be just as valuable as the lengthy discussion of events up to 1932.

Of Hitler's army Rosinski says that "the most intricate coordination between the various . . . ground forces . . . as well as between ground forces and planes, has been the foundation of all its activities . . . the new German army has been largely reduced to the two main arms, the infantry and the panzer forces . . . not until the spring of 1937 was the first panzer division fully established . . . the Spanish Civil War forced a complete revision of the basic policy from reliance on a lightly armed, lightly armored, highly mobile type, to more heavily protected and less mobile models, a trend that has been continuously going on through the whole of the present war." Rosinski doesn't lose himself in admiration for the panzers, and he stresses that their flashy achievements in the battle of France obscured the "very important role played by the infantry masses . . . not until the breakdown of the great Blitzkrieg in Russia . . . did the basic role of the infantry masses . . . begin to receive adequate attention . . . today (the infantry) stands again as an equal partner . . . with the panzer forces."

The second part of the book is devoted to a study of command and coordination, the general staff system, current ideas of the German army, and German strategy in the present war.

The extraordinary lack of cooperation between command, staff, and supply, and the civilian authorities, was one of the prime causes of the German failure in the first World War. Following the war Seeckt, who built the new German army, insisted on concentrating all "power and functions, policy, command, administration, selection, training, research, planning in the hands of a single" authority. It was not until 1938, however, that Hitler achieved what Seeckt had wanted: "the new supreme coordinating agency of the *Oberkommando der Wehrmacht* and the three executive commands of Army, Navy and Air Force." The peculiar role of the General Staff in the German army and its relation to command is covered in a short, but graphic chapter.

In discussing the current ideas of the German army Rosinski stresses the standardization of tactics and leadership. The German army is run, not by an outstanding figure like Ludendorf, but by "an almost anonymous syndicate; a team of a score or so of prominent leaders . . . who appear to be interchangeable . . ."

This high degree of standardization of leadership has serious drawbacks. First is its inability to absorb unexpected hitches which a less highly geared machine could overcome. The second is the "inevitable necessity of tieing down an army at a given moment to a certain standard fighting technique." This makes for high performance and even "a high standard of elasticity within the system, but it necessarily tends to make the system as a whole rigid in its adaptation to entirely new conditions. . . . Perhaps this distinction between elasticity within the system and basic flexibility of the system as a whole may help to explain an otherwise baffling contradiction: how a force like the present German army, constantly emphasizing the elasticity of its methods . . . should yet appear . . . particularly inelastic . . . against a situation requiring a radical reconsideration of its basic framework of ideas, as in the Battle of Britain and in Russia."

In his last chapter on German strategy in this war, Rosinski thinks that it runs directly counter to Hitler's basic conceptions, which were: a neutral Britain and France, and a simultaneous attack by Germany and Japan on Russia. According to Rosinski the war against Britain and France was a mistake, and the "collapse of the Allies in France . . . placed the German High Command in a situation for which it was not adequately prepared intellectually," leading it to attempt the abortive invasion of England instead of a lightning blow against an unprepared Russia. Rosinski thinks that if Hitler had contained Britain and Russia and struck through the Balkans and Near East "he might have won not only the next round but the whole war." In fact, Rosinski doesn't think much of Hitler as a strategist, and he concludes that "at the beginning of the fifth year of the war Germany's strategic position seemed to have become hopeless although not in danger of immediate collapse."

This is a good book, an important book, and it is unfortunate that the author and the publishers did not take more care over it. Muddy language and grammatical and typographical errors lessen the force of Rosinski's able analyses. R. G. M.

JAPAN; ITS RESOURCES AND INDUSTRIES. By Clayton D. Carus and Charles L. McNichols. 233 pp.; bibliography; index; illustrations. Harper & Bros. $3.50.

This is a book packed full of facts which are presented in a most interesting manner. Its mission is to be a handbook for those Americans who will go to Japan, in an administrative capacity, after the war is won. The authors offer advice as to how certain industries and occupations are to be controlled, reduced, or abolished in order to keep the Japanese in a position where they will never again be a menace to other nations.

An outline of the history of Japan, some important Japanese customs, and the Japanese method of conducting business are given. Explanations are presented as to how Japan managed to excel in certain industrial lines and distribute its goods throughout the world at prices which no other nation could approach.

A good deal of this has been due to Japanese ingenuity and invention. A common idea that the Japanese merely copied is quite wrong. They have copied, yes, but they have also devised improvements of their own.

Perhaps the cotton trade is most spectacular, for Japan imported cotton from the United States, manufactured it into cloth, shipped it back, paid a high duty, and yet sold it at prices which our own mills could not meet. The authors explain how this was accomplished. It had been previously studied and reported upon as early as 1935, by a Board of Lancashire textile manufacturers sent to Japan to investigate and report how Japan could accomplish such a result.

The solution lay in an automatic loom, invented by the Japanese. One Japanese girl with this device ran 40 looms. In England union rules required a man to supervise not over 8 looms, resulting in 5 men being employed to do the same work as one tiny Jap maid. She worked 10 hours a day for about 50c in wages, in addition to which she received quarters and rations, with medical attention, free movies, the services of a post exchange, and some other benefits. With all this allowed for, wages in Japan were about 18% of what they were in England. With this advantage—and some others, such as reduced shipping charges—Japan did have a material advantage.

This book will be valuable not only to those who may go to Japan, but to anyone who does business with the Japanese. There is a useful summary, and an index. C. H. L.

TRIUMPH OF TREASON. By Pierre Cot. 432 pp. Ziff-Davis Publishing Co. $3.50.

"The defeat of France," writes Pierre Cot (Minister of Aviation in the Popular Front French Government of 1936-1938), was a "tragedy in three acts: it was prepared by France's isolation, chiefly caused by the rupture of the Franco-Soviet Pact; it was consummated by the military weakness of France, chiefly caused by the General Staff's professional and intellectual inferiority; it ended with the fall of the Third Republic and the policy of collaboration, chiefly caused by Fifth Column activity."

The defeat of France, Petain insisted, was due solely to the mismanagement of the Popular Front. Petain was so sure he could prove this that he held a trial at Riom, charging the arrested ministers of the Popular Front. He packed the court and framed the charges, but men like the courageous Daladier insisted on being heard and on telling the truth. What truth was allowed to be heard was so damaging to Petain, the high command, and the corrupt ministries which preceded and followed the Popular Front, that Petain was forced to adjourn the trial.

We will not get the full story of the fall of France until the war is over, but in the meantime, here is a book which tells what the Popular Front would have said at Riom if it had been allowed to talk. It is the first authoritative account of the fall of France by a high government official. It is a fascinating book which amounts to a short history of France during the tragic thirties. Obviously, the evidence and the opinions must be read with reservations, since this is only one side of the story; but just as obviously, the book should be read by those who want to know why the democracies took a beating from 1933 to 1942 and why fascism has such a terrible hold over so many people.

Cot is searing in his denouncement of the farcical Riom trials and the stupid knavery of the appeasers and isolationists, but he supports his accusations with facts and figures that must be accepted

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as true until Vichy produces more factual evidence than was presented at Riom. When Cot states that the French High Command fought the battle of France with only 45% of available first line planes, 55% of the tanks, and 45% of the AA guns, he states facts that Vichy was incapable of disproving at Riom.

More than half the book is devoted to a study of the military reasons for the defeat of France. His analysis of French military policy and strategy is devastating, and his account of the French General Staff is scorchingly candid. Some of the political and economic material may prove a bit heavy going in detail, but in the larger aspects it again punches home with clarity and force the truth that the wages of political unpreparedness and financial corruptness are defeat.

Cot insists, and apparently proves, that France was betrayed by the politicians and the generals who preferred fascism to democracy. The ability and the morale of the French soldier were good; his materiel was equal in quality but not in quantity to the German, and if correctly used by the high command would have been able to prevent defeat until Great Britain and Russia and the United States could rally to France's help. R. G. M.

ARCTIC MANUAL. By Vilhjalmur Stefansson, 540 pp.; index; illustrated. The Macmillan Co. $3.00.

Some years ago the Air Corps furnished the impetus for an arctic manual. An extraordinary amount of work was involved, but in 1940 Mr. Stefansson turned his manuscript over to the War Department. Slightly revised, it constitutes this book.

Whether you expect to move to the new "promised land," visit it after the war, or merely take an arm-chair trip, you'll find this *Arctic Manual* full of useful and fascinating information. It is written in narrative style and is an eminently readable "Baedeker" to the practical business of living in an arctic climate. Climate and weather, light, animal and insect life, food and drink, clothing and shelter, health, diet, travel—these and similar down-to-earth matters are its subject. The net result is a clear and comprehensive picture of living and working conditions in the far north.

A better man for the job would have been hard to find. Stefansson was born in Manitoba of Icelandic parentage, and when practically an infant moved into the Dakota territory. Since 1906 he has been actively engaged in arctic exploration. One gauge of his success is his having twice been president of the Explorers' Club. And as you know from his many books, he is extremely articulate. He's done a fine job again, and the public definitely gains by his making this manual generally available.

THE DYESS STORY, By Lt. Col. Wm. E. Dyess. 182 pp.; maps and photographs. G. P. Putnam's Sons Co. $2.00.

Last January the *Dyess Story* engulfed the nation. Its account of the horrible sufferings inflicted on our men of Bataan and Corregidor had been withheld until all hope of giving them any help had faded away. The truth outraged and enraged the entire country. Newspapers throughout the land reprinted the story of the "March of Death" and other tortures inflicted by the Japs.

A more complete version is now available in book form. It includes events on Bataan before the surrender and much other material which the newspapers had to forego because of space limitations. It shows more clearly than anything else the utterly callous and inhuman nature of our foe in the Far East. It is a story which every officer and every enlisted man should know.

ILLUSTRATION CREDITS

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