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February 1943

MILITARY INTELLIGENCE SERVICE
WAR DEPARTMENT

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It is recommended that the contents of this bulletin be utilized whenever practicable as the basis for informal talks and discussions with troops.

"Fools say that you can only gain experience at your own expense, but I have always contrived to gain my experience at the expense of others."

—Bismarck.

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PART ONE: Japan

Section I. DOCUMENTS DEALING WITH JAPANESE WARFARE

1. INTRODUCTION

All the information given in this section was taken from translations of Japanese documents of various types; most of them were written within the past few months. They deal almost exclusively with warfare in jungle areas. In some instances, the information has been rearranged or paraphrased in order to make it more logical and readible.

2. APPROACH TACTICS

After having passed through the enemy lines, and while making a reverse turn in the jungle (attack from the rear), absolute secrecy is still essential to success in attacking the enemy. Each unit will bear this in mind, and will see that each individual soldier clearly understands our plan of attack.

Special precaution must be taken in regard to the following points:

a. Cooking operations must be carefully concealed, both day and night. Cooking must cease at least 1 hour before daybreak,

and the fire must be extinguished completely. In going to a river for water or bathing, it is necessary to select the naturally concealed places, or to camouflage a place from enemy air observation.

b. During the approach in thick forest, liaison is made chiefly by telephone and messenger. Prohibit the use of radio. These methods are to be changed only after the attack is started.

c. If the approach is along a road, the road should be wide; if not, remove the weeds near it. However, do not let the changes become visible from the air. Units making a round trip should strictly enforce rules for passing on the left flank, and should prevent delay in the advance.

d. Do not make the forest thin by such action as would damage the large trees near roads and bivouac areas.

e. Progress through clearings and open places in the jungle must be made swiftly and in an orderly manner. Again, when enemy planes are overhead, the unit is required to stop temporarily, even in a forest, if there is any possibility of being observed.

f. It is necessary to take precautions against talking out loud or shouting, even in the forest, because of native spies, enemy sound detectors, and enemy scouts. This is especially the case when close to the enemy position. Again, if the natives are being sighted, it is necessary to kill them immediately.

g. During the movement of each unit, it is necessary to organize an observation party to carry out strict supervision and observation of this movement and to take various other precautions.

h. The approach-march speed of units in the forest must be the same as that of heavy fire weapons. Include in original plans the sending ahead of time of a supply of ammunition and a 12-day supply of provisions.

i. It is necessary for each unit to secure close control in thick forest, using rest periods to reassemble the main force.

Particulary because of soldiers being delayed and falling out of rank, it is necessary for leaders to keep strict supervision.

3. DEPLOYMENT TACTICS

a. The commanders (accompanying an advancing construction unit), together with engineer personnel, will go to the jump-off position being prepared for the division, and will select and mark the sectors to be occupied by the various units. Especially try to scatter each unit involved in the initial fighting, selecting good camouflaged positions. You must take all precautions against enemy discovery. In case you are discovered and receive shells from the enemy, you must be prepared to take any measures necessary.

b. Then each front-line commander will reconnoiter his terrain in preparation for advancing, will indicate the nature of routes to be taken, and will select the next stopping place (deployment line).

c. Movement of the main division force to the jump-off position must be made one night before the day of attack. It is very important to carry out these instructions without confusion, shortening the day of readiness in front of the enemy as much as possible.

d. Each infantry regiment in the division jump-off position (generally about 3⅔ miles inside the forest) will make a deployment. Then each battalion in the first line will select a battalion deployment position, temporarily on a line generally about 1½ miles inside the forest. Deploy after advancing to this line on the route which is already constructed, and again prepare for attack.

e. Each company on the first line will naturally have the approach route open up to the time the battalion advances into the jump-off position, and will approach to approximately 1½ miles from the edge of the forest (same as the battalion deploy-

ment line) and make a deployment. Then the preparation of the attack will be made. Afterwards, a leader is required to make a reconnaissance before the attack. Hereafter, at dusk, you will advance to the line at the edge of the forest; if necessary, crawl through the jungle zone, and immediately rush on to the enemy position after giving the signal.

As it is best for each flank unit to make a rush at the same time, the time should be regulated. Therefore, consider the distance of the forest line and plan for a simultaneous rush.

f. When approaching the enemy, the possibility of encountering enemy patrol and security units must be taken into consideration. It is necessary to annihilate them, as far as possible, and not make any errors. It is necessary to make plans for immediate annihilation of lookout facilities and microphones of enemy artillery organizations when they are discovered.

g. During an approach to an attack, each commanding officer must take the responsibility for maintaining the direction of advance and make the line of development parallel to the enemy line. Even though there are times when enemy fire is received, it is necessary to control the subordinates and not let the unit become confused.

4. COMBAT TACTICS

a. Control of units is the key to successful attack in a dense forest (jungle). When each flank unit makes a rush at the same time, as one group, no matter what the position may be, it can be taken.

b. Flanks of enemy positions can easily be discovered by light tracer bullets. Therefore, every effort should be made to rush from the flanks. It is also very important to assault by immediately chasing the retreating enemy without stopping. When the enemy has observed our assault, he will retreat and concentrate his fire on the point just evacuated. At this time give a

part of the unit the previous duty (the assault), and make a suicide attack into the enemy positions, especially at the antitank gun position. Attack the remaining enemy with mopping-up action. It is very important to make a complete annihilation by dawn.

c. The enemy is very fearful of our assault, and each unit has a tendency to gather into groups. Against such an enemy, hand grenades are very effective.

d. The units rushing the area around an airdrome must try to avoid setting equipment on fire or spilling gasoline. Shoot at the rubber tires and not at the engine of a plane.

e. When advancing to an attack through a dense forest, take precautions on open ground as there may be cases when there is a zone of concentrated enemy fire.

f. When a large number of enemy prisoners are taken during the progress of combat and are looked after by small groups of guards, it is best to take away their weapons and remove their shoes.

g. Take measures to prevent attacks on the left, right, front, and rear of the friendly force. Moreover, carry out the signs of the commanding officer and select each ranking officer to carry out controlled leadership, taking precautions to maintain the thrust to the end.

5. OBSERVATIONS OF JAP OFFICERS

This paragraph consists of tactical opinions given by all officers of a Japanese battalion—after they had experienced considerable combat against United Nations forces in Southwest Pacific islands. A preface to the document stated, "Each unit creates necessary devices, based on these opinions, after considering the enemy combat methods."

a. Marching Through Jungle

(1) Leave some distance between the engineer unit and the units that follow. Moreover, have liaison men advance at least 200 to 525 yards ahead.

(2) The leader at the head must always allow for deviation of compasses.

(3) It is advisable to assemble each unit when resting, as it is customary to march over the road in single column.

(4) Because jungle units carry lights, the commanding officer must advance his unit by leaps and bounds from one defiladed area to another.

(5) The engineer unit must regularly report to the commanding officer in the rear regarding the status of preparations and terrain features at the front.

(6) Camouflage of each individual and each gun must be thorough. Moreover, when crossing a grassy plain, camouflage by using the grass.

(7) If enemy planes are overhead while you are in a grassy area, lie prone in the tall grass and hide the body by placing grass over it with both hands.

(8) Generally, infantry assistance is necessary for heavy weapons units. The minimum is one platoon for a machine gun and one platoon for an infantry battalion gun.

(9) The rate of march for a unit during a day should be about 4 to 6 miles.

(10) It is advantageous to select a route where water supply is possible.

(11) Although it is best to relieve the engineer unit each day, the leading officer in the front should continue his duty.

(12) When bivouacking in the jungle, it is best to begin sleep at 3 o'clock. Cooking must be performed at the last resting place before reaching the bivouac area, which should be completed before the units arrive. This is safe and also tends to hide the biv-

ouac area, making it difficult of discovery by enemy planes (at least two men from each squad should be sent forward to prepare the area).

(13) Be at ease while cooking. Use "marsh reed" and bamboo to make fires. It is necessary to cook in several places, not just one. Moreover, it is important to be ready to put out fires immediately in case enemy planes should appear.

(14) During this military operation, there was never a time when we were discovered by enemy planes while in the jungle. It is significant that enemy prisoners never move, even at night, when planes fly over.

(15) When in flat country, the commander should be in the center of his unit. When on a hill, he should be at the highest point.

b. Night Attacks

(1) Never be overconfident with aerial photographs, especially those taken before enemy occupation, because he will make changes. Pictures of areas directly to our front are extremely necessary for the execution of the attack, and they should be distributed at least down to the first-line assault company. This is especially necessary when maps are not available.

(2) It is important to have sufficient time to move into a jump-off position for an attack. Going long distances to an assault without eating on the way will only tire personnel.

(3) It is advantageous to use as leaders the fatigue personnel of the navy and the present area guides.

(4) It is very important to consider the effective zone of enemy artillery and mortar fire. If units are rushed into the jump-off position when the enemy artillery is not neutralized, useless damage may result. Only the cadre should advance, and it is ideal to set the time for departure of attack about 10 minutes beforehand.

(5) If artillery fire is not received, it is best to assault without

hesitation because heavy losses may result if time is spent in idle complaints.

(6) Most of the fire from enemy positions consists of light tracer bullets. Therefore, the enemy line becomes clear and distinct. It is impossible to attack the front or to assault with a large force. It is important to send one or two squads around to make an assault on the flank. To make a simultaneous attack, wait for an opportune time and then yell. The noise is very successful in demoralizing the foe.

(7) If a rush is made into the enemy firing line, concentrated enemy artillery fire will always be received; therefore, it is best to rush only when close to the enemy. After penetrating the firing line, engage the scattered enemy soldiers again. Therefore, it is necessary to leave one unit (one squad) behind to carry out the mopping-up work.

(8) It is very important for the cadre and men to immediately cut communication and liaison lines within a position.

(9) There is an inclination for the subordinates to scatter by themselves when concentrated enemy fire is received, and it is necessary to mark the position of the company commander and control the men (subordinates) for a wholehearted assault. Moreover, give the men a positive reason for, and an outline of, the company's conduct of battle. It is also necessary to place in each group someone able to use a compass.

(10) The majority of losses are caused by artillery and by pursuing gun fire. Therefore, when they cannot be neutralized, it is necessary for a plan of suicide occupation. In artillery positions there are many automatic weapons with formidable protection, and other strong establishments.

(11) There are many dead spaces within the enemy position. Give the first-line unit adequate front to investigate the dead space and use this to expand the success of battle from the rear and to the flanks. It is also advantageous to assault. In general we do not investigate dead spaces skillfully.

(12) Complete silence is necessary, since concentrated fire can be received even within a position.

(13) Do not use radios, because fire will be concentrated in their vicinity.

(14) The liaison between regimental and battalion headquarters must be carried out by wire, orderly, and other means.

(15) The control of soldiers' voices and markings for commanding officers is inadequate. Therefore, it is necessary for thought to be given to these matters the day before the attack begins.

(16) To carry on the battle after daybreak, the heavy guns must advance during the night—advancing over long distances after daybreak is impossible. A section of the heavy gun cadre must advance behind the first line, reconnoitering the route of advance, and have the unit in the immedate rear pay strict attention.

(17) The enemy usually fires on our jump-off position all night long. It is necessary to advance to the front of the rear unit during a lull in the firing.

6. NOTES BY A MARINE COMMANDER

The information in this paragraph was taken from a Japanese bulletin, prepared by a Marine (Naval Landing Party) commander and designed especially for unit commanders of Marine forces. The bulletin apparently was written before the Japanese met severe opposition in the Southwest Pacific Islands.

a. Handling Personnel

Would you throw away the lives of your men, who have been placed in your keeping by the Emperor, by recklessly sending them on a frontal charge in the face of the enemy fire and ignor-

ing your own shortcomings in leadership and strategy? As a commander, bear this well in mind.

In a word, your object must be to attain the greatest results with the smallest sacrifice. If you order your men to advance, they will obey you in any circumstances and at all times. But remember that before doing this, you are to take the minutest precautions. Do not forget to explain to your men, as carefully as if they were little children, how and in what direction to advance, the places to watch, and what to do when shelled or attacked by hand grenades.

For example, how many men would have come through unscathed if they had been ordered to "lie down until your head is on the ground." This may sound like a graceless criticism of men who have given their lives, but I believe many men have become casualties through their own carelessness and want of caution. It is true that we have dedicated our lives to the nation and will not begrudge them at any time, but we want to accomplish something by our death—not die uselessly. We want to die gloriously. We hope for a death worthy of a Samurai . . . and we owe it to the men under our command to enable them to do likewise. If you do this, as the commanders of a unit, your mind will have a measure of peace.

In maneuvers, we have always had it emphasized that we must get a grasp of actual conditions. During the battle of east Hwatelo (in China) a certain unit commander boasted that he had decided to make a charge, and thereby greatly embarrassed his company commander. I believe this was a case of blind decision. We had been ordered by the battalion commander to strengthen our position and defend it to the death—this meant, if your arms are broken, kick the enemy; if your legs are injured, bite him; if your teeth break, glare him to death. This spirit is expressed in the words "defense to the death." The time to launch a charge is when the enemy has reached the limit of exhaustion, as laid down in the manual. In defense, we believe that if you can

hang on to a position with one light machine gun, one platoon can successfully crush the enemy.

The unit commander must not give up hope or make pessimistic statements. In a battle, always remember the "4 to 6 ratio"—if 4 of our men are knocked out, consider that we have got 6 of the enemy. Whatever may be our own losses, strive to keep up morale. The more violent the fighting, the calmer and firmer must be the commander's bearing, orders, and words of command. It is also important, in the interest of morale, not to let the personnel of the unit know the number of killed and wounded, or their names. Heavy enemy shelling also affects morale, and sometimes troops will not fight as they should. The effect is still more marked when there are casualties.

Some young soldiers think it heroic to expose themselves to the enemy. Take care of this, particularly in a battle of positions.

When fighting is protracted, there is a tendency to get accustomed to the enemy, and relax vigilance against enemy fire and hidden enemies. We have been sniped time and again. Pay particular attention to this.

b. Pointers on Close Combat

Too long a halt in the same area will result in drawing concentrated fire from the enemy, and is inadvisable. The proportion of hits from bullets is smaller while you are moving than when you are stationary. In a charge, if you meet concentrated fire from the enemy at close quarters and lie down and stay glued to the same spot, you cannot advance. Also, the longer you halt, the more your will to advance is blunted, and the greater your casualties. Therefore, charges must be made with determination and daring. A daring and determined attack is the key to victory.

In a charge, the platoon commander must be at the head, as indicated in the manual. The charge is the moment when hardship and fatigue reach their climax, from the commander of the

unit down to the last man. At this time, if everyone is determined to carry out the unit commander's orders without hesitation, and if the platoon commander advances at the head of his men, the spirit of daring and solidarity aroused in the company will enable them to penetrate the enemy position.

"After victory, tighten your helmet strings" (an old Japanese proverb). After fierce fighting, or during a pause in the battle, the mind is apt to relax. This is the most dangerous moment. Even men who are daring and determined during a charge have a tendency to be cowardly as soon as the fighting changes to mopping-up operations, and only scattered fire and small numbers of enemy troops are encountered.

c. Use of Machine Guns

In a naval landing party (Marines), there is virtually no necessity for a machine-gun company. It is preferable to include in each company a machine-gun platoon under the command of the rifle company commander. From the nature of a naval landing party, there is practically no occasion on which a machine-gun company joins in the action as an independent unit with its six machine guns. As a rule, each platoon is detached, and is organized under the rifle unit company commander. This is particularly true in the case of street fighting and fighting at close quarters. Even if a machine-gun company were independent, it would be difficult for it to put up a vigorous fight without the support of the rifle units. Nowadays machine-gun squad training is the main consideration in machine-gun training, and the need for machine-gun company exercises is not particularly felt.

All machine-gun personnel, with the exception of the gunner, must be armed with rifles. This is especially necessary in street fighting, fighting at close quarters, and so on. Even when attacking and advancing, the carrying of rifles never impedes the advance. In case of an enemy attack, it is easy to make a

sortie with the machine-gun ammunition personnel. The ideal rifle for machine-gun personnel is the 1911 model carbine, which is nearly 12 inches shorter than the 38-year type, model 1905.

d. Miscellaneous

The gun loopholes of a position must always be screened with pieces of cloth or matting. If the enemy can see through them, his snipers may fire at them, or he may concentrate his fire on them. This is particularly necessary in the case of openings for heavy machine guns, which must be large on account of the angle of fire.

Even when an action is going on, arms must always receive proper care; otherwise numbers of such arms as rifles, care of which is apt to be neglected, will be found red with rust. It must be impressed upon the men that exchanging fire with the enemy is not the only battle—taking proper care of arms is a great battle in itself.

7. NOTES ON DEFENSE

This "Outline on Defense" was dated Sept. 1, 1942, and was distributed on at least one Southwest Pacific Island.

Special attention should be given at this period to the following matters concerning defense:

a. Selecting a Position

When selecting a defensive position, bear in mind that the enemy in attacking may not establish an extensive field of fire, but may concentrate fire power in a surprise attack from extremely close range. Special consideration should be given to concealment from the air.

b. Disposition

The enemy will approach through the jungle and may attack from all sides, especially from the rear. As a counter measure, deploy all units, from squads to regiments, in circular formation, changing the original frontal positions as the enemy advances.

Utilize oblique and flanking fire to the fullest effect.

c. Construction

(1) To the extent that time permits, construct strong defensive works, including shelter if possible. (Australian methods are most incorrect.)

(2) Provide positions for grenade dischargers, light machine guns, machine guns, and other appropriate heavy firearms. Depending on the enemy situation, either fire in the anticipated direction or hold your fire to avoid disclosing your positions and inviting destruction.

(3) Various types of obstacles should be constructed within the jungle where they will be least expected by the enemy, thereby affording opportunity to strike the enemy at selected places.

(4) Establish ammunition dumps in locations affording maximum protection from detonation by enemy bombs. When storing large amounts of ammunition, construct dumps in several places.

(5) Endeavor to deceive the enemy by constructing dummy loopholes, dummy soldiers (with steel helmet, knapsacks, and so on), and dummy trenches.

(6) Each squad should look after its own water containers, making full use of empty cans abandoned by the enemy.

d. Various Other Preparations

(1) Use every means to secure as much ammunition as possible. The company in particular should utilize captured weapons to the

best advantage (especially automatic rifles, captured ammunition, and hand grenades).

(2) Consider the fire sectors covered by rifles, light machine guns, hand grenades, and so on. Do not omit the preparation of hand grenades.

(3) Allow the enemy to approach very close, then fire calmly at individual targets.

(4) Use ammunition sparingly if it should become scarce.

(5) Do no make a sortie or counterattack heedlessly, simply because the enemy has approached. Such actions may have immediate advantage but casualties will soon result, and it will be difficult to maintain the position. Remain calm as the enemy approaches, and fire to annihilate.

(6) Pay close attention to sanitation, considering the length of time your position will be occupied.

(7) Make certain that adequate provision is made for drainage of quarters, water supply installations, lines of communication, and so on.

(8) In the absence of the enemy, assign one section as lookouts.

8. INSTRUCTIONS TO LANDING PARTIES

a. When Opposed

When opposition is expected, it is best to begin operations before dawn so that occupation is possible at dawn.

Make your landings with the boats in column formation. Or, if the situation demands, use the line formation.

If the landing point is steep, dash under the position so that you will be under the angle of fire.

b. Procedure After Landing

(1) All white troops and police will be captured. In case they resist, they will be killed by shooting and bayoneting.

(2) All white persons and Chinese (including women and children) will be thoroughly searched and all arms confiscated. They will be assembled and confined in a suitable place.

(3) As it is difficult to distinguish Germans and Italians from other whites, they will all be confined together.

(4) Native policemen will be disarmed and confined; however, since they are to be used later for police work, they should be treated with consideration.

(5) In case there are any Japanese, they should be released at once.

(6) Beware of small land mines, especially in the vicinity of the pier.

(7) Do not stupidly drink water or eat anything, as it may be poisoned.

(8) Installations, machinery, goods, and so on will be used later, so do not willfully destroy them.

(9) All radio equipment will be confiscated.

(10) When searching persons, all notes and other written documents must be confiscated, and their contents inspected. The necessary steps will be taken so that at a later time the holder of each document may be identified.

(11) Be especially careful not to destroy furniture, water tanks, ice boxes, safes, and so on.

(12) Cans of food and other useful things should not be punctured with the bayonet in order to inspect them.

(13) It is forbidden to waste food and other material willfully.

9. SECURITY MEASURES

Concerning the secrecy of the battle plan, the following items must be understood thoroughly:

a. During the daytime, there should never be any cooking;

b. Absolutely do not expose any bright lights, even though you are handicapped by darkness:

c. Do not throw any fording materials in the river;

d. Do not talk loudly;

e. Since the natives in this area are not trustworthy, soldiers must not discuss troop movements;

f. Do not use native roads;

g. Do not say "Oi Oi" (English equivalent of "hello"), as this shows that one is not well mannered.

10. REGARDING U. S. SOLDIERS

a. They do not like the jungle at night;

b. They fear our night attacks, especially our battle cry;

c. They use grenades within their positions;

d. Their artillery uses one "leading" shell out of every five shells;

e. They do not make sorties while in a defensive position, and they respect our fire power.

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Section II. EXTRACTS FROM DIARIES

1. INTRODUCTION

These extracts are presented primarily to show how the Japanese react to our attacks, and to give their version of the results we have obtained. The names of the Japanese who have written these diaries have been omitted. The extracts are presented in the order of their dates; each subsection represents a different diary.

2. THE EXTRACTS

"April 18.— . . . Enemy planes dropped bombs and strafed us with machine-gun fire. Our antiaircraft guns and machine guns fired fiercely but were unable to score. Three planes pursued them and disappeared in the volcanic smoke. After that, looking toward the west pier, a cloud of dark black smoke was rising. The blaze looked dreadful. Looking carefully at the blaze, the mast of a ship could be seen directly in front. So I knew, for the first time, that the ship (navy transport ship *Komaki Maru*, 8,500 tons) had been hit by a bomb. In a little while, a truck with many casualties came to my post and inquired the way to the hospital.

"After returning to the tent, I listened to stories from each sentry who had returned. The ship had arrived yesterday, loaded with many bombs and much ammunition, and was to have been

unloaded this morning. At about 1100 hours, the entire ship was wrapped in flames. The ammunition exploded violently, and it was dangerous even to approach the vicinity. All the ships that were near changed their anchorage. Since it would not do to leave it a target for enemy aircraft, the patrol ships and cruisers which were staying in the harbor fired upon the burning ship to sink it, but their projectiles could not hit below the water line because they were so close. The noise caused by the explosion of the projectiles and the rise of flames sky-high in the darkness made a gruesome scene. Even after all of us had prepared for bed, there was noise and vibration that seemed to crumble heaven and earth. Perhaps this was the explosion of the ship's magazine. . . . For the first time, the mighty force of the bomb was known.

"At this place, there are, it is believed, approximately 9,000 prisoners. They must all be very happy after seeing today's bombings. Among them there were some who clapped their hands. All the members of my unit who heard this agreed that it was better to kill them off one after another. . . . However, if we changed places and were in their position, we might also be as happy as they. I guess it is natural to be happy. And yet, knowing that the prisoners were happy, I presume it is natural to say 'Finish them off'."

(Marginal note.) "The stern of the ship exploded and sank. Just the tip part of the ship remained above the water. A little after 1900 hours, there was a great reverberation. Probably the big bombs which were loaded on the stern exploded all at once. Immediately platoons No. 2, No. 3, and No. 4 assembled their emergency unit members. We fell in immediately and climbed into the cars in groups. It appeared that fire from the ship had spread to the warehouse, which was on the right bank. Upon going there, we saw that burning fragments from the explosion had dropped on the warehouse. All at once, the situation was critical, because there were considerable provisions and ammunition within, and all around the vicinity there were moun-

tains of all kinds of gasoline and oil. The ammunition exploded repeatedly, fuel fires flared up, and the area was a sea of flames.

"The crude oil that surged up from the hold spread on the sea surface and burned furiously. Furthermore, the wind fanned the flames. The disastrous scene was gruesome and undescribable. Many times, I have seen pictures in the news of bombed and exploding oil tanks, but actually to see it is a horror utterly beyond imagination.

"April 19.—Just as I was thinking of gaining some much-needed sleep last night, I was asked to go on fatigue duty for No. 4 Company, so I hopped on a vehicle and hurried to the company area. At the place, one of the barracks was blown in half. The soldiers carried their government issue articles, personal belongings, and various kinds of weapons and arms to the material storeroom. When I went to the destroyed place, the trees and leaves were in fragments. Below was a big pool of blood . . .

"The company commander and platoon commander gave orders, one after another. However, it seems as though everyone's face had forgotten how to smile. For a while, each one seemed to have forgotten the work, and, without a word, just stared. After being scolded by the platoon commander, they started to work silently. It was the work of cleaning up the debris. Even the injured worked.

"The badly wounded were said to have died . . . Two died instantly. One barely lived on the way to the hospital and died. Without a doubt, life is beyond determination. Thus, it is probably quite regrettable to die now without killing even one enemy. They probably did not die happily. This also is fate . . ."

"June 11.—In the afternoon, while wearing full equipment, we practiced sliding down rope ladders in preparation for landing operations. Reduced the time for completing the operation from 2 minutes on the first attempt to 1 minute on the second try."

"Aug. 13.—Natives brought us nine Australian prisoners—five men, three women, and one child.

"Aug. 14.—About 0800 hours, we decapitated or shot the nine prisoners."

"Aug. 24.—Our plan to capture Guadalcanal Island came unavoidably to a standstill, due to the appearance of the enemy striking force. In order to give quick assistance to our men and officers, and to stimulate the morale of the Imperial Forces and the national prestige, also because of the fact that it is a very important place for our Imperial Forces, it was decided that the attempt to capture will be carried out tomorrow, the 25th. Disregarding the enemy air attacks, we advanced straight ahead, crossing the equator to the South Pacific Ocean. Today we had three enemy air attacks but suffered no damage. Moreover, the uneasiness of voyages and escort was greatly reduced with the reinforcement of our light cruisers. It added to our display of power.

"Aug. 25.—Six enemy planes attacked our convoy at 0605 hours, while officers and men were smoking and resting on the top deck after a hasty breakfast. The first bomb scored a direct hit on the flagship *Jintsu*. Her bridge was in flames. We were ordered to the upper crew's quarters, but our ship also suffered a direct hit on the bridge. I escaped to a corner of the crew's mess hall. Though I lost control of myself because of the fire caused by the explosion, I only sought for a safe spot. That short and fierce bombing has caused great confusion on the top deck; I still fear an aerial attack. The fierce fires increased greatly in the interior of the ship, and all members prepared the metallic raft. Fearing an explosion in the ammunition stores, they drifted quickly away toward the South Seas.

"Although our men and officers were rescued by patrol boats from the convoy and felt relieved for a while, the enemy attacked us again. They bombed our convoy but we escaped. We who

have been through these attacks can scarcely believe that we have survived such fearful and difficult experiences.

"Our casualties were great. The *Kinryū Maru* received two direct hits and sank. Observing this gave me a feeling of deep emotion. For the Landing Party, August 25 was one of the most dangerous days and must be remembered as our resurrection day."

"Sept. 2.—Stuck fast in the jungle. Our unit could do nothing. In the afternoon, one enemy light cruiser and one transport came brazenly into port during broad daylight. Evidently they brought troop reinforcements. At night there were many hits from the enemy trench mortars. We at the front realized this was the end and made up our minds for death.

"Sept. 3.—The situation became worse. We retreated with our telegraph set. On this date, it seems that the front-line units were completely annihilated before noon."

Sept. 20.—While we were marching, enemy planes dropped bombs in the rear and then machine-gunned us. After this the planes attacked us without a let-up.

"Sept. 21.—Day of rest to ready for the trip back. Thirty-six men out of 238 have malaria.

"Sept. 22.—The enemy has 40,000 troops, mostly Australians. For that reason their fighting power is great. On account of the second Coral Sea battle, our Navy is unable to carry out a landing at Port Moresby. We must wait until about November before another force is organized. There is no replenishment of the food supply, which is enough for only one more day. A food detail went out today, but 7 to 9 days will pass before their return. What to do for the men and patients is a serious problem. We have no medicine for malaria, wounds, and colds. Patients merely wait for death, or for natural healing."

Sept. 25.—When on the way to attack Guadalcanal, on the *Kinryu Maru*, a great fire was started by enemy aircraft. Twenty were killed and several wounded.

"Sept. 29.—As if waiting for the day to come, the enemy planes circled overhead, looking for people to strafe. It is very fierce and the soldiers can do nothing about it. The strafing planes come 6 or 7 times during the day, so our troops suffered considerably. We are awaiting the end of daylight on the 29th. This is our very last general attack. At first we were able, to our surprise, to advance, but as we neared the enemy airdrome, the counterattack became as violent as death.

"The enemy uses light and heavy machine guns and various modern weapons.

"The enemy's camouflage is truly efficient. We have found it hard to discover the enemy, and have suffered unexpected losses. At over 500 meters (nearly 550 yds.) his camouflage cannot be distinguished, and great care must be taken. Training against camouflage should also be carried out.

"Heavy enemy shelling greatly affects morale, and sometimes troops will not fight as they should. The effect is still more marked when it results in casualties. Unit commanders must strive to stimulate morale, and be careful of their own actions and attitude. (At such times the men always watch the expression of their commander's face.)

"When under enemy fire, there is a tendency to fire light and heavy machine guns at random, without looking at the target. The commander must strictly maintain fire discipline.

"Grenade throwers are most effective in striking terror into the enemy. However, a disadvantage is that their range is only 250 meters (about 275 yds.), and so there are few opportunities of using them.

"Before going into action, succession of command must always be clearly indicated. Unless this succession is defined right down to the last soldier, and training carried out until this becomes

practically automatic, fighting may become confused if the unit commander becomes a casualty. When the unit commander is killed or wounded, the effect on the personnel is extremely great, and morale tends to decline. On the other hand, even if one man after another is killed, and the situation is tragic, if the men see their commander's face full of vigor, their courage increases a hundred-fold.

"Patrols must not return the enemy's fire. Some patrols have penetrated an enemy position until they heard voices, and although eventually challenged and fired upon, have kept themselves hidden and carried out their mission. Some of the enemy understand the Japanese language. Take care not to be deceived by the call 'Dare Ka?' (Who goes there?)"

"Oct. 6.—After reporting to the unit commander, I talked with the adjutant and obtained much information. It seems that the unit will depart tomorrow night to occupy the enemy advance position. Before and after the departure many caught fever. Many officers in the regimental headquarters and the battalion headquarters died of fever. There are 20-odd patients in our company. In the platoon, 13 persons were overcome by fever and only 35 persons remained healthy. This is a ⅓ decrease in strength. The sickness is more dreadful than enemy bullets.

"Oct. 7.—Last night we started the advance and arrived at Matanikau River. And, we are engaging in the defense on the left bank area after relieving the 12th Company of the OKA Unit. Early this morning enemy planes circled above us on reconnaissance. In the afternoon, there were fierce gun fires from the enemy artillery, and bombing and machine-gun fires from the enemy planes. We had many casualties.

"Oct. 8.—The bombing from the enemy planes was continued until dark. I talked with the unit commander and decided to stay in the present area. In the morning it was the same as yesterday,

but there also was fierce enemy bombings during clear-weather periods in the afternoon. By the battalion order, we decided to retreat, and we carried out the tragic retreat.

"Oct. 9.—The 1st Company also carried out the retreat from a hill. We assembled our strength in the position of the battalion headquarters. The shells from enemy trench mortars dropped in the center of the troop concentrations, and we fell into confusion. As contradictions occurred successively in the division order, the detachment order, and the regiment order, we suspended the night attack upon the agreement of Unit Commander Tamuma and Unit Commander Unoi, and endeavored to concentrate the troops. The shells from the enemy trench mortar dropped near us, and there were many casualties."

"Oct. 12.—The enemy planes appeared in the vicinity of the Hameawa (River), but there was no bombing. The gun fires from the enemy were rare. Many soldiers fear the enemy gun fire and the morale of the soldiers is very poor.

"Oct. 20.—I am recovering from sickness. I rested all day today. After experimentation for 1 month, we invented the smokeless fuel. (This is probably composed largely of alcohol.)

"The Kuma Unit, of the Ichiki Unit, met with the remnant. They were all very thin due to lack of food. They were eating only coconuts and grasses for one whole month and living in the jungle.

"Oct. 8.—The 2d Company, which was sent out to meet the 3d Company, encountered the enemy at the Matanikau River line and nothing has been heard of it since.

"Oct. 10.—The enemy which is confronting the 3d Battalion totals 2,000 to 3,000 and are taking a formation to envelop the battalion. The 3d Battalion is constantly withdrawing. The 3d machine-gun unit with their leader (16 men in all) and the battalion-gun unit all left their weapons behind and withdrew."

"Nov. 6.—It rains very heavily out here. It has been raining continuously since last night. The epidemic of sickness seems almost incredible. It seems like half of the neighboring field artillery unit has the beri-beri and diarrhea. During the morning we worked on air raid shelters in the rain. Raining, no water, the kindling does not burn!—the hardships of the soldiers are beyond their power.

"Nov. 14.—At the end of the day, after being observed by enemy patrol planes in the early morning, we were attacked by them. They dropped 3 bombs in the 1st round, 2 in the 2d, and 2 in the 3d round. Our planes, which were usually escorting us, did not happen to be there at that time. The conditions were pitiful after the attack was over. Only 4 ships remained as we continued on our course and reached our objective. Determination to make the landing was felt by all on our 4 depot ships. We are determined firmly to fight and avenge our soldiers who sacrificed their lives in the Solomon Sea."

SECTION III. COMMENT BY PRISONERS

1. INTRODUCTION

Since this information has been obtained from prisoners of war, it should be treated with considerable reserve. However, our observers to date have found the average Japanese prisoner to be more truthful in his statements than are prisoners of other enemy nationalities.

2. COMMENTS

a. Regarding Organization

Each rifle company normally has 190 men, but existing conditions in some Southwest Pacific islands have forced the number down to 120. The rifle company platoon usually consists of 52 men, but the prisoner's platoon had 70, and was therefore classed as "independent."

The battalion-gun company normally is divided into 3 platoons, each having 4 guns and about 70 men.

The mountain artillery battalion consists of approximately 500 men.

b. Regarding Equipment

(1) *Landing Boats.*—Each of those used at Buna carried 30 fully equipped infantrymen, or 20 men equipped as machine-gunners, or 10 horses.

(2) *Flame Throwers.*—A prisoner "thought" that each company is supposed to carry three flame throwers. Their use is primarily against fortifications and armored vehicles, the prisoner said.

(3) *Marks of Identification.*—One prisoner stated that his identity disks had been sewn to his uniform. These disks are made of black metal sheeting; they are shiny at first, but rust after brief use.

Another prisoner said that all badges of rank were removed by personnel in his unit before it left Rabaul for action on an island to the south. All marines wore a white cloth badge on the left side of the coats, over the heart. The inscription on these badges included name, rank, company, and date of birth.

(4) *Eye Shield.*—These are issued to all troops as a protection against sun glare, but are seldom used, because they affect the eyes and are considered a nuisance.

c. Regarding Supplies

(1) *Ammunition.*—One prisoner said that each rifleman carries 60 rounds into the combat area, while others stated that the number was 120. A supplementary supply is carried by natives. Shells for the infantry battalion gun (70-mm) are packed five to a case, which

weighs about 75 pounds. Larger shells, for mountain artillery, weigh about 20 pounds each.

Normally each soldier carries two hand grenades.

(2) *Rations.*—The information on rations was conflicting, probably because of the differing local tactical and supply situations. One prisoner said each man in his unit carried rations for 2 days upon landing, while another's unit carried sufficient food to last for 20 days.

d. Regarding Medical Care

One prisoner stated that each Jap soldier was issued 10 antimalarial pills, to be taken one per day for 10 days. At the end of the 10-day period, they took a round of smaller pills. The prisoner said he did not know the nature of the pills except that they prevented malaria. His unit had no malaria until the pills ran out. He added that the Japs would not use mosquito headnets because of the heat.

Another prisoner, questioned regarding malaria, said about half of his unit was attacked by fever—he did not know if all were malaria cases. Light cases recovered in 3 days, the serious ones took as long as 3 months.

e. Regarding Suicide

The following dialogue between a captured Japanese warrant officer of the Naval Air Service and his interrogator is reported from the Southwest Pacific:

Q. After the war is over, what would you like to do?

A. In accordance with our tradition, I would like you to allow me to destroy myself.

Q. That is contrary to our ideas and we cannot allow that, but if there is anything else which you would like and which we have power to grant, we would like to do so.

A. I would like to have my hair cut.

PART TWO: GERMANY

Section I. 50-MM ANTITANK GUN

1. GENERAL

In the summer of 1941 the German Army replaced its 37-mm antitank gun with the 50-mm, model 38. To date the 50-mm has proved one of the most effective antitank guns that the Germans have at their disposal. Armor-piercing projectiles fired in this gun weigh 4 pounds 9 ounces, and have been known to pierce the armor of British infantry and cruiser tanks as well as that of U. S. light and medium tanks. The gun has proved especially effective in jamming tank turrets by hits at the junction of the turret and hull. These hits fuze the metal of the two parts together and immobilize the turret.

This gun usually is mounted on a split-trail carriage with a shield of spaced armor plate. It is generally towed by a half-track, and has a third wheel which can be attached to the spade piece on the trail for manhandling the piece into position.

The Germans manufacture a self-propelled version of this gun. Also, the gun is commonly mounted in their Mark III tanks. When used in a Mark III tank, it can be fired electrically, instead of by percussion, and is used without a muzzle brake.

The 50-mm antitank gun fires armor-piercing shells, high-explosive shells, and armor-piercing 40 shot. This last has a windshield (light, streamlined nose) and a tungsten carbide core. It gives a good armor-piercing performance at 500 yards. Incidentally, the latest type of armor-piercing shell also has a windshield.

2. TABLE OF CHARACTERISTICS

Muzzle velocity	(AP)	2,740 fs
"	(AP 40)	3,940 fs
"	(HE)	1,800 fs
Maximum range	(AP)	1,540 yds
"	(AP 40)	770 yds
"	(HE)	2,640 yds
Effective range	(AP)	1,000 yds
"	(AP 40)	500 yds
"	(HE)	2,000 yds
Number of grooves		21
Twist		1 turn in 32 cals
Rate of fire		16 rounds per min
Total weight of gun		1,626 lbs
Depression		−18°
Elevation		27°
Traverse		65°

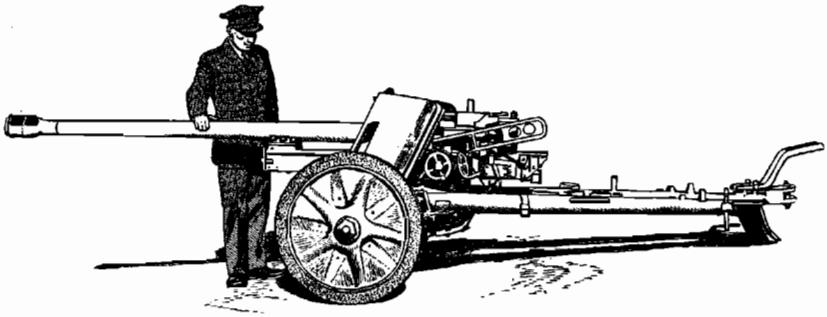

Figure 1.—German 50-mm Antitank Gun.

3. DESCRIPTION OF COMPONENT PARTS

a. Tube

The tube is of monobloc construction with a muzzle brake attachment, and is 111.25 inches long without the breech ring.

b. Recoil System

The recoil system consists of a hydropneumatic recuperator and oil buffer.

c. Breech Mechanism

The breech mechanism is of the horizontal sliding-block type. It works semiautomatically, and also can be worked by hand.

d. Safety Arrangements

Unless the sliding breech block is properly closed, the safety plunger will not enter its recess in the lower face of the breech ring, and the gun cannot be fired.

If the safety plunger is not in its recess, the firing shaft cannot be turned.

If the firing pin is not in the cocked position, the breech cannot be opened, since the firing shaft is engaged with the safety plunger, which is in its recess.

e. Firing Mechanism

The firing mechanism is operated from the elevating gear handwheel. It is a push-button attached to a wire

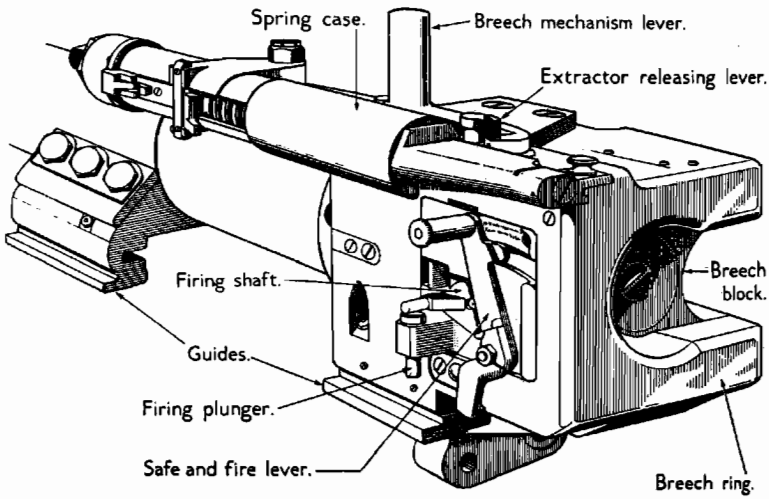

Figure 2.—Details of the German 50-mm Antitank Gun.

cable which actuates a lug on the cradle. This, in turn, actuates the firing plunger upward on to the firing shaft of the breech mechanism.

f. Sights

The firing bracket is mounted on the left trunnion, and either a telescopic sight or an open sight can be used. The sight bracket has lateral deflection gear, a range drum, and means of adjustment for azimuth and elevation. The telescopic sight is of three-power magnification.

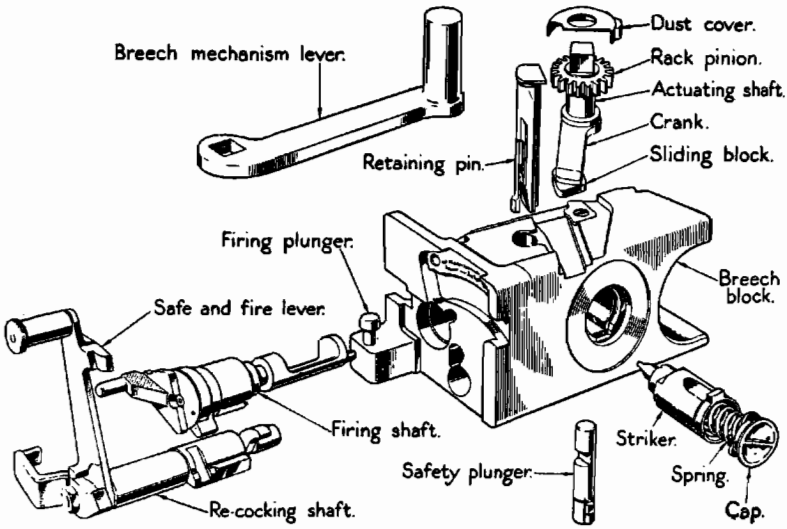

Figure 3.—Details of the German 50-mm Antitank Gun.

The range drum is so calibrated that when the maximum range for armor-piercing shell (1,540 yards) is reached, the gun automatically is sighted for high explosive, beginning with 330 yards and going up to a maximum of 2,640 yards.

g. Elevating Mechanism

The elevating gear is operated by a handwheel on the left side of the carriage. It allows 27 degrees for elevation and 18 degrees for depression.

h. Carriage

The gun has a spaced armor-plate shield composed of 2-mm to 4-mm plates about 1 inch apart. It has spoked wheels of a light alloy, with solid rubber tires. A third wheel can be attached to the spade piece so that the gun can be moved by hand.

4. AMMUNITION

Type	*Weight of complete round*	*Length*	*Weight of projectile*	*Fuze*	*Identifying marks*
AP tracer shell.	9 lbs. 3 oz.	21.4 in.	4 lbs. 9 oz.	Base.	Black projectile.
HE shell	7 lbs. 3 oz.	23.7 in.	3 lbs. 15 oz.	Nose.	Dark green projectile.
AP 40 shot	----------	--------	2.025 lbs.	None.	Black projectile.

PENETRATION DATA

Type shell	*Range*	*Angle*	*Compact*	*Penetration*
AP shell	250 yds	30°	Plate-hardened to same degree throughout.	60 mm (2.36″)
AP shell	1,300 yds	Normal	Same	60 mm (2.36″)
Unconfirmed on AP 40	330 yds	20°	Same	90 mm (3.54″)
	440 yds	20°	Same	64 mm (2.54″)

NOTE.—The above tests were fired with a limited supply of ammunition and the results probably represent underestimates.

5. CREW

The crew consists of the gun commander, No. 1 (gunner). No. 2 (loader and firer), Nos. 3 and 4 (ammunition handlers), and No. 5 (chauffeur).

Section II. USE OF 20-MM AA/AT GUN AGAINST GROUND TARGETS

1. INTRODUCTION

A German document, evidently written by a platoon commander of an antiaircraft-antitank company, deals with an antiaircraft-antitank battalion's use of the 20-mm dual-purpose gun against ground targets.

2. EXTRACTS FROM THE DOCUMENT

a. General

The 20-mm gun on a self-propelled mount combines the fire power and mobility of an antiaircraft gun with the accuracy and penetration of an antitank gun. It is insufficiently armored, however, and this fault must be offset by making good use of cover and by fire control.

The smallest unit in battle is the section of two guns. Use of single guns, except for individual tasks like the engagement of enemy observation posts, is exceptional. Ground observation is most important; every spare man must be employed on it, and must be made personally ambitious to spot targets.

b. Action During Assembly

During assembly, antiaircraft-antitank troops usually take over protection against air and land attack. Guns must be sited so

that attacking aircraft can be engaged from reverse slopes, while, by moving the gun to a position on the forward slope, it is possible to bring under fire the enemy approaching on the ground.

c. Action During Attack

The antiaircraft-antitank troops support the advance of the infantry and other arms. For this purpose the antiaircraft-antitank guns should be sited to a flank, to exploit their range fully without endangering the advancing German troops. The addition of 100 yards, more or less, to a flank hardly interferes with the effectiveness of the 20-mm gun, whereas it does affect the enemy's infantry weapons by widening the target.

When in action only the following remain on the vehicle: driver and gun commander and Nos. 1 and 4.[1] When the gun commander is away on reconnaissance for a new gun position, No. 3 takes his place. The other men (who are the ammunition handlers) give protection and carry out flank observation. If there is no mine-spotting section available, the ammunition handlers must search for mines in the ground to be passed over.

The platoon or section commander and his runners follow directly in the rear of the attacking infantry or the assaulting engineer detachment. The commander reconnoiters good positions and good targets for the guns.

d. Fire

Good fire discipline (including good observation) is of the greatest value; this is gained by experience and will be made easier by cooperation with the attacking troops and the various observation posts. The sectors of fire must be assigned. Telescopes and rangefinders will be used to the fullest.

[1] The duties of Nos. 2 and 3 are not indicated.

e. Movement

Changes of position must be made quickly. Occupation of a gun position from a flank must be avoided if possible. The guns will advance by bounds. If they meet slight opposition which can be broken by one section, the other section remains in reserve and, after the action, leapfrogs forward as an advance section while the first makes itself ready again.

When close to the enemy—for example, when breaking into his positions—the guns fire on the move. This forces the enemy to take cover, and weakens his morale.

f. Defense

When bivouacking or holding a defensive position, the guns occupy prepared positions under cover. Other alternative positions are prepared, battle outposts are put out, and landmarks are recorded.

g. On the March

On the march the battalion is disposed as follows:

No. 1 gun—protection to front and right.
No. 2 gun—protection to front and left.
No. 3 gun—protection to rear and right.
No. 4 gun—protection to rear and left.

Under air attack, a similar formation will be adopted. On the section commander's orders, the troops will halt and open fire. Aircraft will be engaged only if they spot or attack the battalion's own positions, if bridges or observation posts need protection, or if the aircraft offer especially good targets.

h. Tanks

It has been proved that the gun, rightly used, can put even the heaviest tanks to flight even if it cannot put them out of action;

that is, by its high rate of fire it can jam turrets and gun mantlets. The most effective range against tanks is under 400 yards. Every effort must be made to attack them from the sides.

3. EXTRACT FROM A GERMAN NEWSPAPER'S COMMENT ON THE 20-MM GUN

The duties of the anticraft-antitank battalions are, above all, to protect other units against low-flying attacks while on the march and in action. For this purpose the 20-mm gun is principally used.

The battalions are part of the infantry's support. Troops of these units are therefore trained as infantrymen; but, in addition, they learn their own weapons, including training with different sizes of rangefinders in height estimation. Otherwise, the training corresponds to that of flak units. The antiaircraft-antitank units (the platoon is the normal fighting unit) are located in the column of march according to the prearranged operation order. In case of surprise attack, fire is opened either immediately from the tractor on which the gun is mounted, or else sections (which are fully motorized) leave the column and occupy a position on firm ground with a good field of fire, with the gun dismounted. After fighting, the units catch up with their original position in the line of march.

Antiaircraft-antitank guns use only tracer ammunition—high explosive against aircraft, and, if necessary, armor-piercing ammunition against ground targets; they have a limited ceiling and are used principally by day. Antiaircraft-antitank troops have no listening apparatus or searchlight batteries and do not pretend to rival the flak artillery. Further tasks include: protection of divisional artillery against low-flying attack, participation in ground fighting by neutralizing enemy machine-gun nests and other strong points, or defense against single tanks.

Section III. ATTACKS ON CONCRETE FORTIFICATIONS

In the following report, British Intelligence officers summarize German methods of attacking concrete fortications.

1. PREPARATION

A typical attack is preceded by a short artillery concentration on the objectives. The artillery then lays down smoke. Under the concealment that this affords, the infantry and its supporting weapons get in position at short range. These supporting weapons will include antitank guns, and possibly field guns, placed under command of the infantry, as well as heavy machine guns, mortars, and infantry guns.

When the smoke clears, all weapons open fire on specific loopholes allotted to them. Under cover of this fire the infantry and engineers move in to the assault.

2. ASSAULT

The assault on pillboxes can be made in several ways, but all these depend on the principle that if you are near enough to a pillbox, you can get inside the angle of fire of its machine guns and be safe—just as you can when you are approaching a tank.

Pillboxes, however, usually will be sited so that they are covered by machine-gun fire from their neighbors. Therefore, pillboxes can be attacked in this way only if supporting fire keeps the embrasures of neighboring pillboxes shut, or if more smoke is put down to isolate the particular fortification to be assaulted. The actual attack on pillboxes may be made either with explosives or with flame throwers.

Infantry sometimes can get close up under the embrasures and push grenades inside. Engineers, who carry more powerful charges, can blow up pillboxes and, by mounting charges on the ends of poles, can attack embrasures that they cannot reach otherwise. These pole charges are a common engineer weapon. The infantry can improvise a similar charge by tying the heads of six stick grenades around a complete central grenade.

Two sizes of flame throwers are carried by the engineers. The range of both is claimed to be about 30 yards, but may in practice be no more than 20 yards. The smaller can produce a jet of flame for 10 seconds, the larger for 25 seconds. The larger must be hauled on a two-wheeled trolley.

A method simpler than either of these has been used to neutralize pillboxes—namely, to plug the embrasures with sand bags, which may be effective for a few moments.

Section IV. ARMORED FORCE TACTICS IN THE MIDDLE EAST

1. INTRODUCTION

United Nations observers in Libya have reported that there are four principles that German armored units seldom fail to consider before advancing to attack.

a. The primary role of the tank is to kill infantry.

b. The machine gun is therefore an important weapon of the tank.

c. The tank can be successful only when it is used in conjunction with all arms.

d. Tanks must be used in mass.

As a result of these views, the Germans will not fight a tank versus tank battle if they can avoid doing so. Moreover, their tactics are always based on having their armor move with other arms, in close support, in the form of a "box" or moving defense area.

2. THE BOX

The box is that part of the German column which appears inside the solid lines in figure 5. It varies in

size, but if an armored battalion is the basic unit, the box might contain the following combat troops, in addition to tank ground crews and other service troops: 1 battalion of motorized infantry, usually carried in half-tracked, semi-armored vehicles; 1 battalion of 50-mm antitank guns; 1 battalion of 88-mm antiaircraft-antitank guns; 1 battalion of 150-mm close-support guns, sometimes on self-propelled mounts; and 1 battalion of divisional field artillery. Under these circumstances, the box would be approximately 2 miles deep, with a frontage of 200 yards.

On the move or in the attack, the dispositions of the guns in the box are as shown in figure 5; that is, the antitank and antiaircraft guns guard the flanks and the front. The infantry guns and field guns usually are inside the box only when the defensive is assumed.

The 88-mm, although a very effective antitank gun, is included in the box primarily to protect the "soft-skinned" vehicles from air attack.

3. METHOD OF ADVANCE (see fig. 4a)

Over flat terrain the distances between the various elements of the German column are approximately as follows: between the reconnaissance unit and the first echelon of tanks, 5 to 10 miles; between the first and second echelons of tanks, 1 mile; and between the second echelon of tanks and the box, 2 miles. The whole formation is directed toward an objective which, if

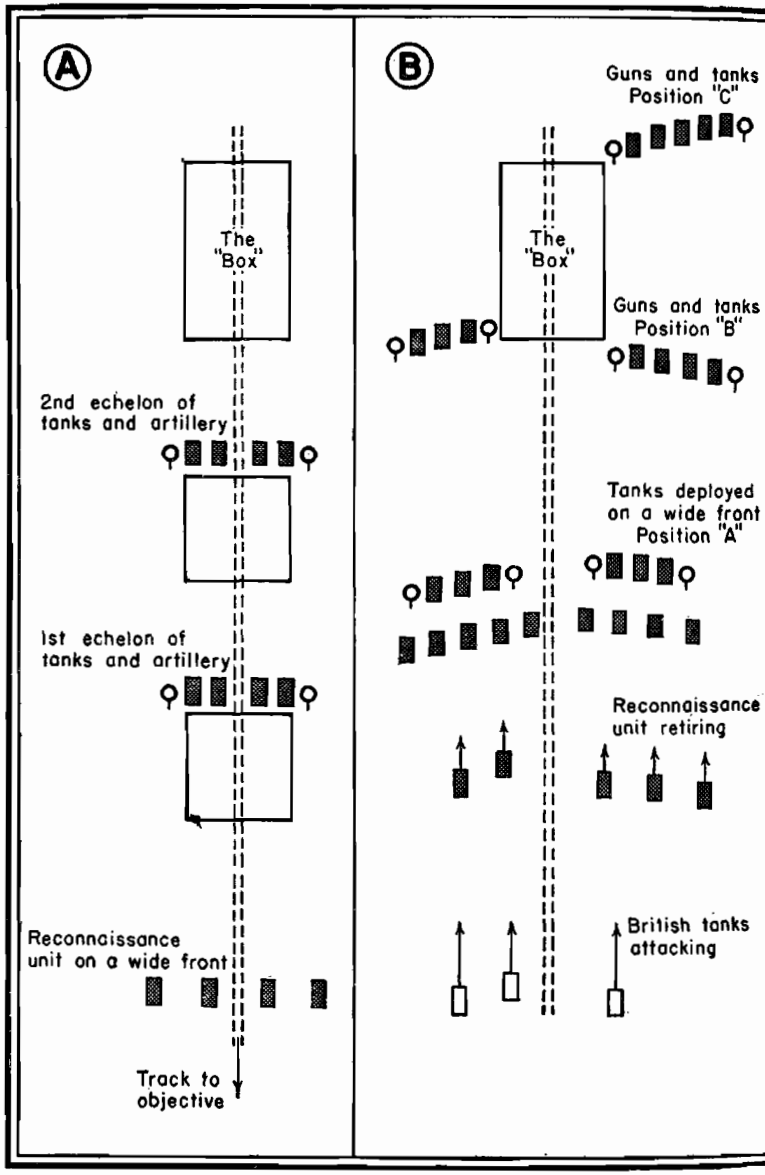

Figure 4.—German Armored Force Tactics.

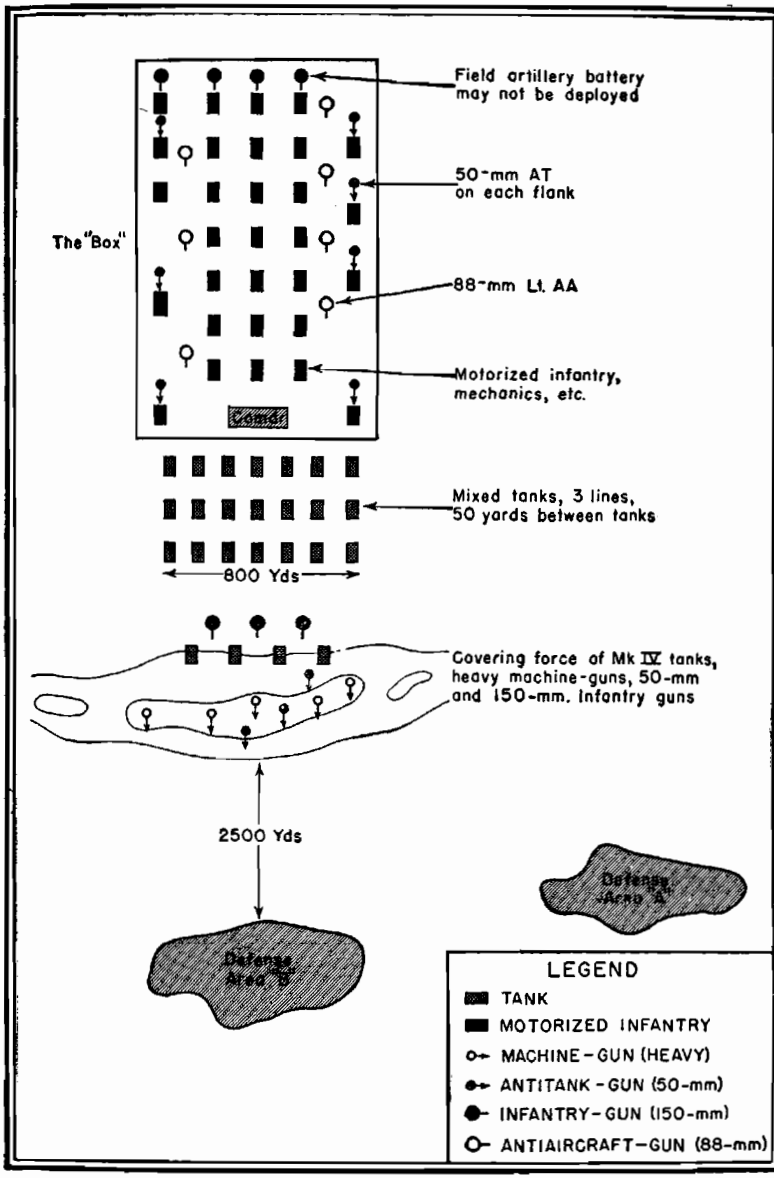

Figure 5.—German Armored Force Tactics (continued).

seized, will force the opposition to fight and thus become engaged on ground of German choosing.

On normal terrain each element of the German column moves from high ground to high ground, and the separate echelons of tanks are supported by field artillery, which moves behind them.

4. METHOD OF FIGHTING IF ATTACKED ON THE MOVE

As soon as United Nations troops are reported to be advancing and contact appears imminent, the box halts and takes up a position for all-around defense. This can be done very quickly because of the type of formation it uses while on the move. As the United Nations tanks advance, the German reconnaissance unit falls back, and the two echelons of German tanks deploy on a wide front, as illustrated in figure 4b, position "A."

If the United Nations troops continue to advance, the Germans retire to position "B," and force the opposition to attempt to break through one flank.

If the opposition attacks the German left flank, the troops on the left of the box at position "B" fall back to position "C." If the opposing tanks pursue, they not only are engaged frontally by the German tanks from position "C," but are caught in the flank by the antitank and antiaircraft guns protecting the left side of the box. The tanks of the German right flank at position "B" then swing around and engage the attackers in the rear. If the artillery has accompanied

the tanks in the advance, it may either continue to support them or may enter the box to increase its antitank strength.

5. ATTACK LED BY TANKS AGAINST A SINGLE DEFENSE AREA

The Germans realize that it usually is impossible for an attack in depth to pass between two defense areas or to cross the front of one defense area to attack another. The attack is therefore launched approximately "head on." Such an attack may be carried out in the following way:

a. Phase 1

The Germans will reinforce their reconnaissance unit with tanks deployed on a wide front, and will drive their covering force ahead until it is approximately 2,500 yards from the "crust" of the opposition's defense area (see fig. 5).

b. Phase 2

A most careful reconnaissance of the defender's positions will then be carried out by a senior commander in a tank, to decide which defense area to attack. In Libya last winter, when British defense areas were not necessarily sited on high ground, a great deal depended on whether the Germans could get a position about 2,000 yards from the British front on which to deploy the German covering force. In figure 5 it is assumed

that the Germans found this, and are going to attack defense area "B."

c. Phase 3

The covering force now deploys as follows: Tanks, generally Mark IV's, take up a hull-down position on the ridge, and with the fire of their machine guns attempt to pin the defense. They may engage visible antitank guns with their 75-mm's. Under cover of this fire, 50-mm antitank guns, heavy machine guns, and close support 150-mm infantry guns are also deployed in an attempt to knock out the antitank guns of the defense or to kill their crews.

The majority of the weapons in the deployed covering force are dependent on direct laying and therefore can be blinded by smoke.

Under cover of the fire of their covering force, the Germans form their rear in the following manner:

(1) Three rows of tanks, with about 50 yards between tanks and about 150 yards between rows.

(2) When the tanks are in position, the box forms in the rear, as illustrated. The infantry ride in their carriers.

d. Phase 4

At zero hour the entire formation moves forward at about 15 miles per hour, depending on the terrain. As the tanks pass through their covering force, they

begin to fire, not so much with a view to hitting anything as for psychological effect.

Arriving at defense area "B," some tanks drive straight through to the far side, while others assist the infantry in mopping up. The infantry usually do not dismount from their carriers until they arrive in defense area "B," when they fan out, using Tommy guns extensively.

e. Phase 5

If the attack is successful, the covering force moves forward into the captured area to stiffen the German defenses that are being established there. The tanks generally are withdrawn and serviced near what has now become the rear of the former defense area.

f. Conclusions

It takes 2 or 3 hours to prepare and stage such an attack.

If the attack proves successful, no minor counterattack is likely to drive the Germans out. Their defense is very rapidly organized, inasmuch as all the weapons they require are immediately available.

Such attacks are now being beaten off, and it is apparent that in the future they will not succeed without considerably increased artillery support.

The whole form of the attack has been reduced by the Germans to a "battle drill."

Section V. WINTER FLYING PROBLEMS

1. RUNWAYS

From numerous experiences during the winters of 1940 and 1941, the German Air Force has found that the maximum efficiency in winter operations is attained by using wheeled landing gear as long as conditions permit. Such use requires immediate rolling of the runways after any appreciable snowfall.

Where heavy snowfalls are expected, the runways are marked off in advance with relation to the prevailing wind direction, so that rolling can be started as soon as the snow is about 2 inches deep. The runways should be laid out to avoid take-offs over mounds of snow or other irregularities of ground and to eliminate as much as possible the necessity of making crosswind landings.

Snow fences must be erected as a protection against drifts. If the direction of the prevailing wind coincides with that of the runway, the fences are set at an angle of about 25 to 30 degrees to the wind in order to deflect the snow outwards. It is especially important to place fences at the intersection and at the ends of

the runways, and to erect suitable warning markers on all obstacles caused by such work.

Rolling should be carried out continuously to prevent the formation of dangerous snow heaps, and the rolled surface subsequently raked to minimize ice formation. Taxi aprons, as well as main and auxiliary runways, should be kept clear of snow as long as possible.

2. SKIS

The change-over from wheels to skis (see fig. 6) is usually made when the unrolled snow has reached a depth of one-third of the diameter of the aircraft wheels. When the snow is deeper, landing on wheels is possible without risk of turning over, but take-off is prevented by the high rolling resistance of the snow. During this period, special take-off sledges are used. These become detached as the aircraft rises, enabling the plane to land on wheels.

To safeguard the undercarriage as much as possible, landings and take-offs with skis should always be made on snow which has not been rolled. Aircraft on skis must be taxied only on snow-covered surfaces. Taxiing over snow mounds and slopes with sharp drops should be avoided because the skis have a limited range of deflection. As ski-equipped airplanes have a dangerous tendency to ground-loop in cross winds when taxiing on ice or rolled snow surface, extreme care should be taken to keep them from swinging. Multiengine aircraft may be taxied by the use of either out-

board engine, but small curves cause high stresses in the undercarriage and must be avoided. There are no brakes on skis, since on deep soft snow the length of the landing run is shorter than with unbraked wheels.

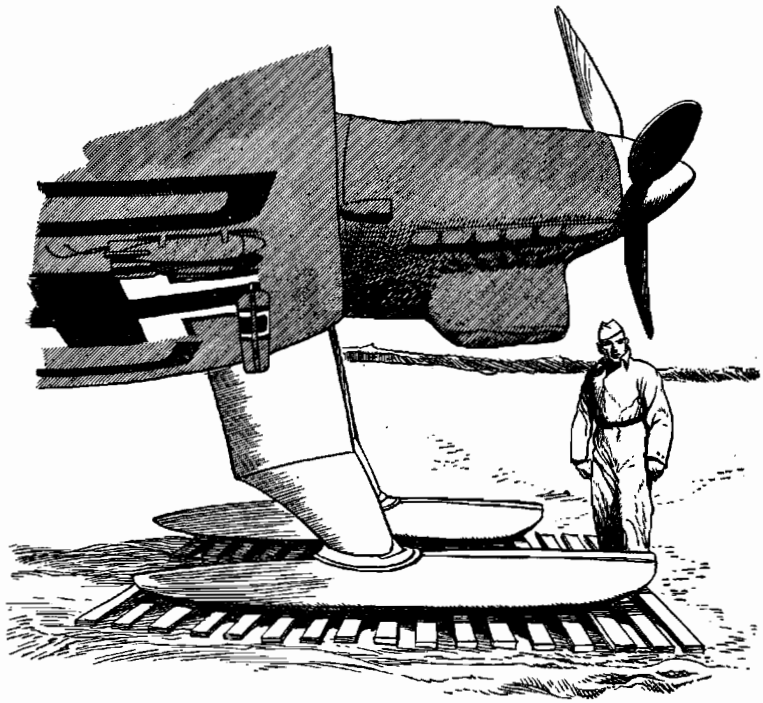

Figure 6.—German Aircraft on Skis.

The normal length of take-off may be expected when the snow is frozen and the temperature below zero, but in warmer temperatures the friction coefficients may become very high, necessitating a longer run. If con-

ditions are so unfavorable that it is impossible to take off, a runway may be created in the snow by taxiing to and fro repeatedly. The take-off run may be interrupted without danger, since an airplane on skis comes to a standstill quickly if the engine is throttled. On the take-off, the handling of aircraft with skis is the same as for those equipped with wheels.

From the point of view of flying, there has been no difficulty in operating the various types of aircraft with skis attached, although speed and general effectiveness are reduced between 5 and 15 percent. However, single engine flight with a Ju 88 so equipped is not possible, and an He 111 with skis can barely maintain level flight on one engine. The same principles apply to the landing run as to the take-off, except in night landings. Light is reflected in the direction of flight by flat expanses of snow on the field, which makes judgment as to altitude impossible, unless the surface has been walked on or ashes have been sprinkled to cut the glare and provide identification marks.

The aircraft must not be allowed to come to a standstill upon landing, but must be taxied immediately to a previously prepared parking place, equipped with suitable wooden parking gratings which have been smeared with a graphite paste or used engine oil so that the skis will slide over them. Multi-engine aircraft, because of their size, require at least 10 parking gratings while single-engine planes need only about 4.

The space between parked aircraft fitted with skis must be twice as great as for those with wheels, because it is not always possible to taxi accurately with skis.

The aircraft are placed on parking gratings so that they will not freeze to the ground. If the bottoms of the tires should become frozen, they must not be forcibly freed but can be loosened either by applying salt, saltwater, or hot air, or by inserting a wire between the tire and the ground. Skis should not be loosened by pushing the fuselage backward and forward, because no undercarriage can stand the strain. Light aircraft may be freed by shaking the wings, with the engine at full throttle. Heavy planes must be jacked up so that wooden gratings can be pushed under each ski. If the equipment necessary for this is not available, the snow must be shoveled away until only one-quarter of the ski, at the center, is still standing on snow. It is then possible to release the aircraft with full power by moving the elevator and rudder.

It is not necessary to wax the skis, but after about 10 flying hours the sliding surfaces must be inspected for signs of wear, and light damage to the hard paper or cement covering may be repaired quite easily. As the stresses on the undercarriage are greater with skis than with wheels, all parts must be carefully inspected at least every 20 hours. In case of boat skis, the cover must be freed from snow and ice before the take-off to obtain complete freedom of motion. In milder

weather, these skis must be drained of accumulated snow water daily.

Aircraft fitted with skis must never be moved over ground free from snow without using a special dolly or some other device, nor should aircraft be dragged by the tail skid, even when a moving device has been fitted to the main skis.

3. STORAGE PROBLEMS

If it is impossible to heat the main hangars properly, a separate living room, adequately heated, and a warm, well-ventilated storeroom should be provided. The temperature of the storeroom should not fall below 50 degrees Fahrenheit. Ground maintenance equipment, as well as all drums containing lubricating oil and cooling fluid, should be housed under cover if space is available, but at least one transport vehicle, engine heater, and engine starter should be kept ready for immediate use in a warm place. As much gear as possible should also be kept in heated storerooms. Everything left in the open has to be protected from the wind and condensation by use of matting, tarpaulin, or straw.

Rubber covers, inner tubes, and cables become sensitive to kinks and bends at temperatures below −4 degrees Fahrenheit, but elasticity is restored at room temperature. The most satisfactory temperature for the storage of such articles is between 40 and 60 de-

grees Fahrenheit, as prolonged higher temperatures are detrimental to rubber. Since the capacity of batteries falls off rapidly with extremely cold temperatures, it is essential that they be removed from equipment left in the open and stored in a warm place until needed. They should be kept fully charged as discharged batteries are likely to freeze at temperatures below 32 degrees.

High-pressure containers should be kept under cover and, if possible, not exposed to cold.

Lubricating oil and antifreeze solution must be stored in protected sheds, heated, if possible, with special precautions against penetration of the drums by water, snow, and ice. The containers, with the filler on the top side, should always be placed on wooden blocks, and should be protected against the weather on all sides. If a warm storeroom is not available, it is possible to warm the drums by covering them with a tarpaulin and blowing in hot air from the engine heater. Baking ovens made of stones and heated by a wood fire may also be used to heat the drums.

Lacquers and certain other finishes (known as "airplane dopes") are very sensitive to cold and dampness, but the place where they are stored must not be directly heated because of the danger of fire.

The lighters that are used for marking out landing runways or obstructions have a very short life in low temperatures, and so are stored during the day in a warm room.

4. STARTING COLD MOTORS

When starting aircraft after a snowstorm, or after prolonged inactivity, all drifted snow deposits must be cleared away. The best way to do this is to open the inspection holes, and thaw or blow away the snow. All aircraft engines require some pre-heating, if they have been left in the open when temperatures are below freezing point. At temperatures below —4 degrees Fahrenheit, it is especially difficult to start an engine because the fuel, injected into the cylinder or atomized by the carburetor, condenses on the cold walls of the cylinder and intake pipes and prevents combustion.

The method generally used to heat the engine is to cover it with a heavy canvas hood and force a draft of hot air into the bottom opening. To do this, the Germans use an engine heater (see fig. 7), which can warm an airplane motor within 15 to 20 minutes, raising the temperature of the engine approximately 50 degrees. This device heats air by passing it over burning vaporized fuel and then blowing it through double-walled canvas tubes into the hood placed around the engine. The blower of this apparatus may be operated by either a gasoline or an electric motor.

The pre-heating of lubricating oil appears to be the main factor in speeding up cold-weather starting. During cold starts, the lubricant becomes easily diluted by the unburned gasoline in the cylinders, and the oil sludge deposited in the engine dissolves. A much larger quantity than usual is carried to the oil filter. For

this reason, it is essential that oil be removed and thoroughly cleaned after each long flight. However, if cleaning devices are connected to a rod in the cockpit, the pilot should clean out the filter during flight. The oil coolers and oil lines to engines should be covered with felt or asbestos to keep in heat while the engine is running. The Germans have also been experimenting with the use of acetylene in starting aircraft engines at very low temperatures, but no operational use of this method has yet been reported.

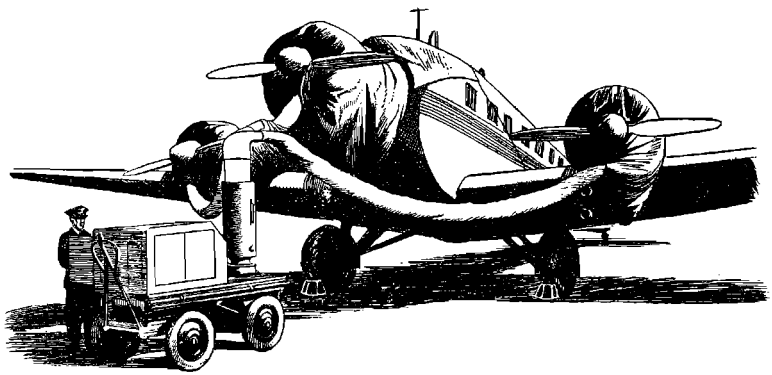

Figure 7.—German Aircraft Engine-Heating Device.

As variable-pitch propellers are subject to freezing, the blades should be placed in take-off position, with a small angle of attack, when the engine is stopped. During cold starts, the pitch of the propellers should be altered several times backwards and forwards by operating the speed control. This insures that the control mechanism and the oil servo-motor become filled

with the cold-starting mixture. This also applies to electric, constant-speed propellers, where the pitch-changing mechanism should be operated over as large a range as possible to distribute the grease uniformly over the gears. This prevents the propeller from changing pitch of its own accord. The gear mechanism should be warmed if the air temperature is below —4 degrees Fahrenheit.

To protect the cooling system against frosts, a mixture of 50 percent glycol and 50 percent water is recommended. Any outside openings or vents leading to the instruments should be covered when in flight, so that snow or rain cannot enter the lines and freeze. All control hinges should be covered with a thin oil to prevent the collection of moisture and subsequent locking of control surfaces.

5. ANTIFREEZING METHODS

The Luftwaffe has developed a special anti-ice paste to be used on the wings, turrets, and tail unit when there is danger of icing. However, as this paste causes the camouflage paint on the aircraft to peel off, it is applied only when there is real danger of ice formation.

When the snow is thick, the control surfaces are likely to be damaged on take-offs and landings by pieces of ice. Care must be taken to insure that the fuselage and lower side of the wings and control surfaces are snow- and waterproof, since snow may penetrate into the aircraft and be deposited there. Subsequent

freezing may block the controls or the mechanism for retracting and lowering the landing gear. At very low temperatures, too tight control cables may contract enough to tear away from their supports.

Since ordinary bombsights are electrically heated, they are not affected by extreme cold, but the noses of all bombs exposed to the airstream must be treated with anti-ice paste.

To insure satisfactory operation of guns at low temperatures, maintenance must be carefully checked and guns, appliances, and mountings tested before every flight. During prolonged flights at very low temperatures, the guns should be operated at regular intervals to prevent excessive cooling. Muzzle caps should be fitted on all guns so that snow or ice will not enter the mechanism. When Oerlikon "FF" 20-mm fixed cannon are mounted on aircraft operated under winter conditions, they must be equipped with a special recoil spring, as otherwise the gun may stick when it is fired.

Section VI. MISCELLANEOUS

1. FIELD PATCHING OF ARMORED TROOP CARRIERS (HALF-TRACKED)

In the field the Germans have made use of an unusual type of patch to cover holes pierced in the armor of their half-tracked armored troop carriers.

The plates are secured by conical-headed bolts inserted through the holes and—in the case of patches examined to date—held by steel strips at the back (see fig. 8). Apparently the plates have been designed especially for this purpose. Their peculiar shape permits them to be fitted anywhere on the armor service.

The plates are drilled in five places; the three top holes are countersunk, while the lower two are not. It is worth noting that in specimens of patching observed, the fixing bolts did not fit into the countersinks. Although the reason for the three countersunk and two plain holes is not entirely clear, it is quite possible that one plate is meant to serve as a background or securing plate—hence the two plain holes. This theory seems borne out by the fact that the securing bars which have been observed to date appear to have been makeshift jobs.

2. MAP SIGNS FOR OBSTACLES

The following symbols, which the American soldier may find on German maps, are taken from a German Army document.

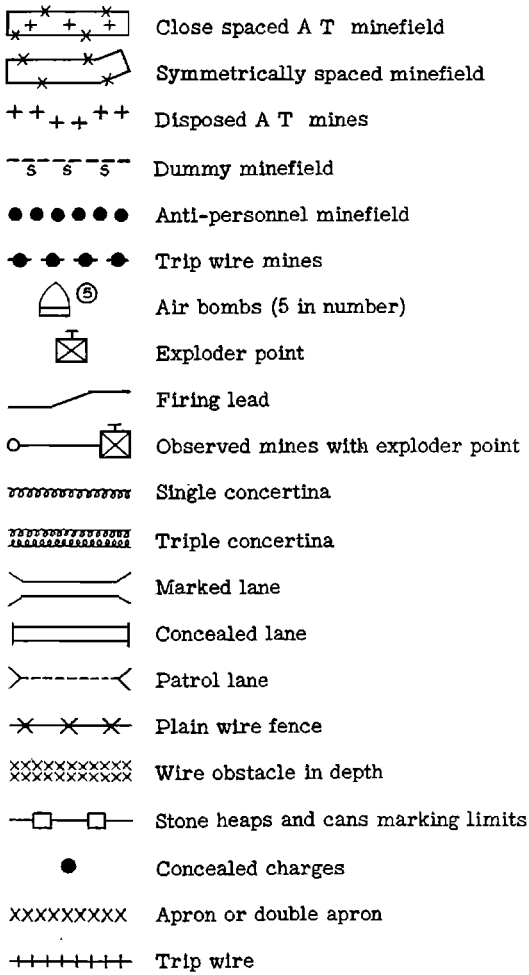

Figure 9.

PART THREE: UNITED NATIONS[1]

Section I. HOW TO USE YOUR EYES AT NIGHT

1. INTRODUCTION

Modern war is often fought at night. This means that men must learn to see in the dark—or at least to use their eyes in new and unfamiliar ways.

This article is written to tell you how to make the best use of your eyes at night. It will help you, whether your job is in an airplane or a tank, on a ship, or driving a truck, or just getting about on your own feet.

It will not give you the uncanny eyes of an owl or a cat, but it may give you just the edge on the enemy you need to get in the first shot—and to get home.

You already know that when you go into a dark room from a bright one, it is hard to see until your eyes have become used to the gloom. At a movie it takes a minute or two to see the vacant seat. It may take another minute or two to be able to recognize a friend. During these minutes your eyes become more sensitive to the faint light.

[1] In *Intelligence Bulletin* No. 4 (December 1942), "Part Four: United Nations," page 77, subparagraph c, substitute "2 degrees" for "20 degrees" in the sentence which reads "The pole star is never more than 20 degrees away from true north."

2. ADJUSTING FOR DARKNESS

Your eyes adjust in two ways for seeing in the dark. One way is by opening up to let in more light or to make maximum use of what little light there is. This works in the same way as a camera diaphragm, which can be opened up wide for taking pictures in dim light. Your eye pupils open wide in dim light and close to a pin-point opening when the light is very bright.

But this is not the most important change in the way your eye works in dim lighting.

You actually have two kinds of sight. Your day eyes use one kind of vision cells known as "cones." They are principally located in the very center of the eye.

Your night eyes use an entirely different kind of cells, the rod cells, which are mostly around the outside edge of the eye.

The rod cells used by your night eyes are color blind. That is why "all cats look gray at night." If you see a colored light shining at night, and it looks red or green or blue, it is only because it is bright enough so that you can see it with your daylight eyes.

But your night vision is much more sensitive to light of some colors than to others. Red is seen equally well by night and day vision. Blue light, however, affects your night eyes 1,000 times as much as it does your day eyes. For this reason it is extremely dangerous to use blue lights in a blackout because it affects the enemy's eyes just as much as it does yours.

Night eyes lack the sharp vision for detail that your day eyes have. If you want to see to read, if you want to watch the dial of an instrument, if you must look at a map, a road sign, or your watch, then you must use your day vision. For this you must have good light—the more the better. Especially if the print or other forms are small, the light must be bright.

Night eyes are extraordinarily sensitive to faint light. This is shown by calculations that an ordinary candle flame could be seen at a distance of more than 100 miles if the night were completely black and if haze, dust, and the curvature of the earth did not interfere. A lighted match is about as bright as a candle flame. Under ordinary night conditions, a match can be seen from a plane for many miles away.

Night vision is not in use as soon as you step into the dark. It takes time—a half hour or more—before your eyes are completely adapted to the dark. When you leave a sunny street to go into a darkened theater, or step from a brightly-lighted room into the dark outdoors, you are completely blind at first.

Then several things happen. First the pupil of your eye dilates, letting more light into your eyes. This is a mechanical action.

Next the cones of your day vision adapt to the darkness. This takes about 5 minutes, and after that you feel more comfortable about moving around in the pitch dark.

After a much longer time, your rod vision adapts itself to the darkness and you can begin to see shapes and outlines in the gloom that were not even vague bulking shadows when you first came in.

Just how this change-over from cone to rod cells is accomplished is not completely understood, but it is at least partly a chemical process.

The soldier who, at a command or an alert signal, leaves a lighted room to run on duty without having prepared his eyes is completely at the mercy of the enemy insofar as his vision is concerned. By the time he gains the use of his night eyes, the emergency may be all over.

And even when your eyes are adapted to the dark, flashing on a light, even for a very short time, may ruin your night vision for another half hour. You can lose in a few minutes all you gained by half an hour in the dark. The brighter the light and the longer you look at it, the more you lose.

3. GETTING YOUR EYES READY

Complete darkness is the best preparation for night fighting. It pays to protect your eyes from light before you start and while you are out. If you can't stay in darkness, keep the lights around you as low as possible and don't look straight at them. If it is necessary to look at any lighted object, be as quick as you can about it. Experiments have shown that looking

at an instrument dial lighted only by radium paint will cut down the distance at which you can see a friendly or an enemy plane by 50 percent. Don't look at the dial any longer than you must or the loss will be greater.

Experienced gun pointers and spotters know that they must not watch the flash of their guns as they fire. The flash of a 6-inch gun may dull the eyes for a minute or more. Under continuous fire at dawn or dusk it is impossible to aim some rapid-fire guns accurately at a target more than 7 times a minute if the gunners watch the flash. At night the blinding effect would be even greater. Looking away from the flash gives almost complete protection. Luckily the flash of rifles and small-caliber machine guns has much less effect on the eyes.

There are several ways by which one can become dark-adapted or maintain dark-adaptation, even though working in a fairly bright light. Each method is suitable for certain types of jobs, and each has its limitations and dangers. A patch worn over one eye will keep this eye ready for night duty at any time, but vision from one eye alone is not as accurate as binocular (two-eye) vision, especially in judging distances of nearby objects. An individual may work in red light, or wear close-fitting red goggles, either of which are effective since red light has little effect on the rod cells and leaves one ready for nearly instant action in the dark. It is wisest to consult a medical

officer concerning the necessity for such preparation, and the methods best suited for the task at hand.

4. USING YOUR EYES PROPERLY

Always remember that you must look a little to one side in order to see best on a very dark night. Learn to pay attention to things which are just a little off to the side. Learn to keep from looking directly at any object. As you feel your eyes drawn irresistibly toward what you want to see, just let them slide on over it to the other side and look again with the tail of your eye. It takes practice to learn to do this without fail, but it is worth the trouble to learn the trick.

And don't keep looking steadily to the same side of an object. This will make it disappear, too.

Try it out yourself and see how your eyes at night can play "parlor magic" tricks on you.

When in your darkened room or outdoors, hold up your finger and look steadily at it. It will disappear. Look a little to one side and it will appear again. But if you keep staring at this side it will soon be gone again. Move your eyes to the other side and back and it will reappear.

This means that in searching the sea or the sky for a dark object, you must look at first one area and then another. When you think you have spotted something, keep looking first on one side of the object and then at the other, or above and below it.

But don't try to sweep your eyes over the sky or the horizon—you can't see well while the eyes are moving. "Scan" the sky, don't sweep over it. Night eyes are slow in responding. At night a faint object may not be recognizable until after you have looked near it a number of times. If you have ever hunted quail in the morning or watched deer in the dusk, you know that you can look right at such a camouflaged object for a while before you notice it. In darkness such an object is even harder to pick out because you won't see it at all if you stare. You have to look again and again at points near it.

5. CONTRAST HELPS NIGHT VISION

Another thing that affects our vision at night is the contrast between an object and its background. If the thing observed is very different from its background, it is much more easily seen. An airplane may be clear if you look up at it against the night sky, but invisible if you look down on it against the dark ground. A ship may show up clearly against a star-lit sky, but fade into the background if you are looking at it against a background of dark water.

If light from the moon is reflected onto the under side of an airplane from white clouds below, the plane may become almost invisible from any angle.

To notice small differences in contrast, it is essential to have clear vision. It is for this reason that windshields must be kept clean and free of scratches or fog.

These tend to scatter light in all directions and reduce contrast. Careless night fighters have been known to tolerate enough dirt on their windshields to double the time it takes to see a plane moving along near by. And sailors on ships sometimes let the salt from spray pile up in blotches on the glass. This is courting death.

For the same reason it is important to keep down the lights on your side of a windshield. Any light on your side reduces the contrast because stray light spreads over the whole glass and reflects in your eyes. That is why you push up close to a window when you try to look out at night. By coming up close, you shade part of the glass and increase the contrast of the objects seen through this part. If it is necessary to have any light on your side, keep it as dim as you can and screen it from the glass. This also helps your adaptation to darkness.

6. VITAMINS

There has been a good deal of talk about the effect of shortages of vitamins A and C on ability to see at night. These are the vitamins in fresh vegetables, cheese, and fruit. People who don't get enough of these vitamins do become poor in night vision, but regular Army and Navy rations supply plenty of these vitamins. Occasionally when boats are on long trips or when fighting lasts until fresh foods are all gone, a shortage of vitamins may occur. In these cases medical officers will

supply men who are likely to be on night duty with vitamin capsules. Extra vitamins don't improve night vision if your diet or your night vision is already normal.

Night vision is affected by fatigue. Anything that reduces your physical well-being has a greater effect on night vision than on day vision. Experiments have shown that hangovers, slight illnesses, or excessive fatigue may double or even triple the amount of light needed to see an object. The night fighter must train for his job as a boxer trains for a big match. The boxer who is not at the peak of training is likely to be knocked out. The night fighter whose eyes are not at the peak of efficiency is likely to be killed.

7. REMEMBER THESE THINGS

a. Protect your eyes from light before you go on night duty and while you are out.

b. Don't look directly at any light or illuminated object. If you must, be quick about it.

c. Use the corners of your eyes. Night targets are more clearly seen when you don't look directly at them.

d. Keep your eyes moving. Quick, jerky movements and short pauses are better than long, sweeping movements and long pauses.

e. Keep your windshield spotless and free of scratches and fog.

f. Keep yourself wide awake and on the alert. Don't break training. Use good sense about eating, drinking, and smoking.

g. Practice what you know about seeing at night until it becomes second nature to use your eyes to the best advantage. Use every possible device to aid you in learning to recognize ships, planes, and other important objects from slight cues.

Section II. BRITISH TRAINING NOTES

1. INTRODUCTION

The following article is a summary of a set of training notes prepared by the British Army, and should prove of special interest to our junior officers. The British stress the point that the object of all training is success in battle. "Modern battles," they say, "are fought by 'teams of fighters,' whether the team be a section, platoon, squadron, battalion, or regiment." They reason that since good training instills confidence and morale, their soldiers have an obligation to themselves and their outfits to seize every opportunity to train.

2. FOUR ESSENTIALS TO VICTORY

a. The Right Beginning

Troops must be launched into battle correctly; otherwise, it is difficult for large or small units to recover the initiative. All officers must understand the conduct of battle operations, especially with regard to their own level of responsibility.

b. Efficiency of Subordinate Units

Once the battle is joined, the issue passes to the junior leader and his subordinate unit. If the junior leaders are not well

trained, and if the standard of minor tactics is bad, we fail—no matter how good the higher leadership may be.

c. Fighting Spirit

If our troops are not mentally and physically fit and tough, and do not have the "light of battle" in their eyes, again we fail—however good the higher leadership and minor tactics.

All ranks must be made to feel the offensive spirit. They must be trained to fight and to kill. Every soldier must be the master of the weapons with which he is armed, and must be ready and willing to use them. This applies to clerks, drivers, cooks, and other specially employed men.

d. Battle Drill

Battle drill is a procedure by which we insure a common line of approach to the battle problem of subordinate units, and a common procedure within these units.

A good system of battle drill, wisely used, will permit the speeding up of deployment and will enable the small unit to develop its maximum battle power quickly.

If every officer and man in the field army and the training depots is taught this common procedure, it will insure full cooperation in battle. When all personnel are taught the same battle drill, there need be no changes in methods when reinforcements arrive or when casualties require substitutions in junior leaders.

3. ORGANIZATION OF TRAINING

Well organized training will produce good results. Individual and collective training must be sandwiched, and the available time allotted in accordance with the needs of the unit.

The degree of training that is possible will vary with local conditions. Formations in reserve and in rear areas will be

able to devote their whole attention to training. Formations in forward areas in contact with the enemy obviously will not be able to do this; in these formations, however, units in local reserve can do a great deal of training, and all units can do something. Wherever you are, observance of the following points is essential to produce good training:

(1) Prepare your programs well in advance.
(2) Be enthusiastic.
(3) Make all training interesting and varied.
(4) Introduce realism.
(5) Keep your training simple.

4. INDIVIDUAL TRAINING

a. Enlisted Men

The individual training of the rank and file should be based on three main principles:

(1) *The Grading of Every Man.*—Every man must be graded carefully. After this, instruction is given in accordance with the needs of the individual. The grading applies chiefly to weapon-training subjects, gas, and specialist training, but a commanding officer may grade for any other subject he wishes.

There are three grades:

Grade A—Men who pass all tests, and are above the average. These men are earmarked as potential noncommissioned officers or specialists, and receive training as such.

Grade B—Men who are average, and who require half the full instruction.

Grade C—Men who are below average—who cannot pass their tests, and who require the full-time instruction in all subjects.

The whole unit should be graded in this manner once every three months.

(2) *Rewarding Merit.*—Men are dismissed from parade or instruction if they are doing well. The instructor, after 30 minutes, may fall out the good men—or, if the whole squad is good, let them all fall out.

b. Officers

(1) *Preliminaries.*—Commanders must train their own officers. Officers' days should be held at least once a week, wherever a unit may be, and the following subjects are among those that must be taught:

The technique of movement.
Battle drill, or general management of battle.
How to plan and carry out various types of operations.
Reconnaissance and deployment.
The cooperation of all arms in battle.

Officers should be instructed first by means of situation models, discussions, and demonstrations. The models need not be elaborate, especially since sand models are easy to make. Next come tactical exercises without troops, and then skeleton exercises. The headquarters exercise, the artillery exercise, the signal exercise—all these are of the greatest value.

(2) *Verbal Orders.*—Officers must learn to give simple and clear verbal instructions. Orders will produce only the results they deserve. You can train as much as you like, but unless your plan is clear and your orders decisive—and unless junior commangers know not only what their immediate task is, but what the main object is—you will not get the best results. (Often you will get no results at all.) It is for this reason that officers must have continual practice in giving verbal orders.

(3) *Ground and Distance.*—All leaders must be trained in the selection of ground. In country where features are not numerous,

it is of the utmost importance to be able to pick out dominating ground. Most soldiers are bad at judging distance, but experience will remedy this.

(4) *Intercommunication.*—Efficient communications, which must be maintained throughout all phases of a battle, are primarily the result of training. All forms of communication must be practiced. Within the infantry battalion's area of responsibility, visual signaling and radio, singly or together, may provide the means at any time in battle whereby just the vital order or item of information may be transmitted and received. These means are complementary to each other, and alternatives must always be provided when communication lines are of paramount importance.

Regimental signaling personnel must be especially selected.

The standard of radio efficiency must be high in all units, including infantry battalions.

Infantry company commanders must practice indicating artillery targets and correcting artillery fire. Field officers and company officers must continually practice together.

Good maintenance of equipment, especially wireless sets and batteries, is vital. This includes routine testing.

Assistance in all communication problems must be a part of the responsibilities of chief signal officers, officers commanding divisional signals, and brigade and regimental section signal officers. Full use should be made of these officers.

c. Noncommissioned Officer and Specialist Cadres

Noncommissioned officer and specialist cadres (for reinforcements) are necessary at all times. Formations and units in the forward areas should train cadres in their rear echelon. It is important to maintain a high standard in training for specialists.

To insure a uniform standard, specialists must be tested by a neutral board.

d. Sniping

Every infantry battalion must have a proper sniping organization, so that the battlefield may be dominated.

It is suggested that each company should select two known good shots for training as company snipers and in addition, one man in each section to be trained as the section sniper. Wherever possible, snipers should be issued telescopic sights or special sniping rifles.

These snipers must be highly trained in fieldcraft, camouflage, and marksmanship. Normally, they should be trained to work in pairs.

Their main task will be to locate and kill enemy commanders and reconnaissance parties.

e. Maintenance

The importance of daily routine maintenance inspections must be taught to all ranks. There must be a morning and evening maintenance period. All officers below the rank of major who are in charge of vehicles should attend these periods. They should not stand about idly, but should pitch in and do a good job of work.

The daily maintenance task system must be introduced and insisted on, so that it will become automatic under any conditions. The tasks for armored force vehicles may be based on mileage, to some extent.

During maintenance periods, all specialists must carry out maintenance on their particular equipment—wireless sets, mortars, and so on.

5. COLLECTIVE TRAINING

a. Instructions by the Commander

The commander must issue instructions covering the following:

(1) The object of the training.
(2) The principle on which it is to be based.
(3) The standard aimed at.
(4) The phases of war to be studied.
(5) How he wishes the available time to be used.
(6) Special instructions regarding night operations.

b. Rules to Observe during Training

The following are important points to observe during collective training:

(1) The training must be mixed. During company training, battery training, and so on, the whole battalion or regiment with full equipment should go out once every two weeks.

(2) Collective training must be based on preparing all units to live hard, move light, and fight simply.

(3) All arms must study how to operate efficiently without taking their full equipment into every battle. In certain battles, and in certain country, it may be possible to leave various types of equipment out of the battle. The carrying of unauthorized equipment in vehicles is forbidden.

(4) During unit training, every exercise must include dusk and dawn operations. These are the times when things happen in war.

(5) Realism must be injected into the training, and the conditions of the battlefield be reproduced as far as possible. Troops must be trained to advance under cover of artillery and mortar fire.

(6) Full-scale collective training should be real tests of endurance for commanders, staffs, and troops. They should be made to face difficult situations when really tired. If they are not tough, they will fail.

c. Operations to Be Taught

The following operations must be taught and practiced:

(1) The attack planned in complete detail.
(2) The dusk attack.
(3) The night attack.
(4) Penetration of obstacles.
(5) Reorganizing and holding the ground gained.
(6) Disengagement and withdrawal.
(7) Defensive tactics.
(8) Counterattacks.
(9) Patrolling by day and night (from one leader and two men to a platoon).

d. Unit Drills

(1) Movement by motor transport and on foot.
(2) Reconnaissance and deployment.
(3) Occupying a position by day and night.
(4) Bivouacking.
(5) Night attack.
(6) Mine lifting and laying.
(7) Infantry attacking with tanks.
(8) Consolidating an objective.

e. Night Training

Efficient training in night work is most important. Whenever possible, all units must carry out night training at least three nights a week. A continuous week of night work is strongly recommended for all training units. At first, all personnel must be taught how to move, observe, and listen at night. All units must be able to operate on dark nights, as well as when the moon is bright.

In training for a night attack, sufficient time must be allowed before daylight for consolidation of an objective already won, and for proper digging-in.

f. Crossing Minefields

All troops must be taught the technique of crossing a minefield, which is similar to the technique of crossing a river. It must include:

(1) Careful reconnaissance.
(2) Clearly marked routes and gaps.
(3) Alternative crossings.
(4) Mine-lifting party.
(5) Covering party and artillery support (if by day, smoke).
(6) Control and collecting points for motor transport vehicles manned by officers. Maintenance of good communications with an officer in charge of lifting operations.
(7) Order of priority of crossing.
(8) Lights and tape for marking.
(9) Recovery posts.
(10) Lines of departure. Assembly and re-assembly areas.
(11) Wire-cutting party.

6. GENERAL PRACTICES

a. Infantry vs. Tanks

Infantrymen must be trained to stand their ground when attacked by tanks. They must be taught that the heaviest possible concentration of small arms fire must be directed against all attacking tanks, from the moment they come within range, to force the tanks to close down. When the tanks are close enough, they must be attacked with sticky grenades.

All ranks must be taught the general characteristics of tanks, and at training depots tanks should be attached for a few days so that men may get used to them. All men must practice remaining in slit trenches and allowing tanks to run over them; also, they must ride as gunners in tanks. This will teach them

that, at close range, tank guns cannot place fire on men in slit trenches.

Tank-hunting parties must be trained so that they can go out and destroy disabled tanks, and attack them when in bivouac.

b. Artillery

It is most important to train units to control their ammunition expenditure, and to render ammunition returns; if this is overlooked, it leads to waste.

c. Antitank Guns

Antitank units must be trained in the selection of defiladed positions, and taught to dig their guns in.

d. Concealment

It is of the utmost importance that all defense works be well camouflaged and that all subordinate units have alternative positions to which they can move. Troops must be taught to dig in at once when taking up a position. This applies equally to artillery and infantry.

There are three types of positions. They are constructed in this order:

(1) Fire positions.
(2) Alternate fire positions
(3) Dummy positions (when there is time to make them).

e. Organized Rest

If all ranks are going all-out on fighting and training, it is essential to have organized rest. This must be adhered to strictly by all personnel.

f. Map Reading and Navigation

Map reading and navigation can always be improved. It is a great help in map reading if all commanders shade, in two or three different colors, the high ground on their maps.

g. Assault Courses

All training units should make assault or blitz courses. These are excellent for testing the fitness of all ranks. The courses can be laid out on any piece of ground—if possible, in an area in which live ammunition can be used. Blank ammunition, smoke, and fireworks will provide realism. Battle inoculation must be introduced at all training depots and reinforcement camps. Troops must be trained to advance under cover of artillery, mortar, and small-arms fire. They must also be shot over.

h. Observation

(1) *General.*—Too often during exercises infantry soldiers confine their attention to the back of the man in front. They fail to notice any objects or indications of military significance. Trivial details may disclose a great deal to an alert mind and keen senses.

Men must be taught to use their eyes. This training must be systematic and progressive.

(2) *A Suggested Exercise.*—A suggested form of exercise in the latter stages of observation training is as follows:

A route is selected over varying terrain. The route should avoid roads and tracks, and should pass through both open and close country—if possible, where the going is moderate at first but becomes rougher. Approximately 2 miles is sufficient for initial exercises. A number of objects should be laid along the route, and at varying distances from it—a fixed bayonet projecting from a

bush, a steel helmet appearing above a rock, a clumsy imitation of natural camouflage, trip wires, men placed in position both close at hand and in the distance along skylines and crest lines, suspicious movement of individuals, rifle and light machine-gun fire, and prearranged noises and signals.

Students, accompanied by an instructor, follow the route and note objects seen, and the kinds and directions of noises. The men are not allowed to halt, but are kept on the move the whole time. The exercise is done best with small squads. Men should not march in formation, but should be at liberty to march as they please, provided that the prescribed route is adhered to.

Common faults are:

(a) Confining one's attention to a single suspicious object for too long and neglecting the rest of the area, thereby falling into a trap.

This fault can be demonstrated to squads by surprise attacks staged from a direction other than that in which their attention is fixed.

(b) Focusing either on the foreground or on the distance; thereby failing to include the whole perspective in one's sphere of observation.

A squad on a recent exercise, after spotting individuals in the distance, failed to observe a man with a light machine gun in the open at 25 yards, and, once having spotted certain nearby objects, failed to notice distant movements on skylines.

i. Marching

The fact that infantrymen often are carried by motor transport must not result in any reduction in the capacity for marching. Infantry must train to march at least 15 miles a day and fight a battle at the end of it. There is always a tendency to use vehicles for short journeys which could easily be done on foot.

j. Speed of Vehicles

Speed limits for each type of vehicle are laid down to prolong the lives of the vehicles, and to conserve spare parts and tires.

Excessive speeds and dangerous driving still are common and unchecked. This is simple unit discipline, and must be enforced.

k. Cooperation

It cannot be emphasized too strongly that successful battle operations depend on the initial cooperation of all arms, whether in armored or unarmored units.

No one arm, alone and unaided, can achieve successful results in battle. In training it should be made clear at an early stage that all arms must work together in the closest possible cooperation.

It will be stressed that intercommunication is a primary factor in the cooperation of all arms.

Every man must know the exact location of his own immediate headquarters during all phases of the battle.

Section III. HOW TO USE TROUSERS AS A LIFE PRESERVER

1. INTRODUCTION

The idea of using trousers as an auxiliary means of keeping a man afloat was submitted to the Office of Naval Intelligence by the commanding officer of the Naval Training Station, San Diego, Calif. All recruits trained at the station are taught the technique. This technique, with illustrations, is given in the *Intelligence Bulletin* because troops of all Army branches may be placed in situations where such knowledge might mean the saving of lives.

2. THE TECHNIQUE

The first step in the process is to tie each leg of the trousers with a suitable string or cord about 3 or 4 inches from the bottom (study fig. 10). If no string or cord is available, tie an overhand knot with each leg. The trousers are then grasped in the position commonly used for dressing and swung overhead from the back. The man then jumps into the water, holding the trousers at arms' length over his head. Upon strik-

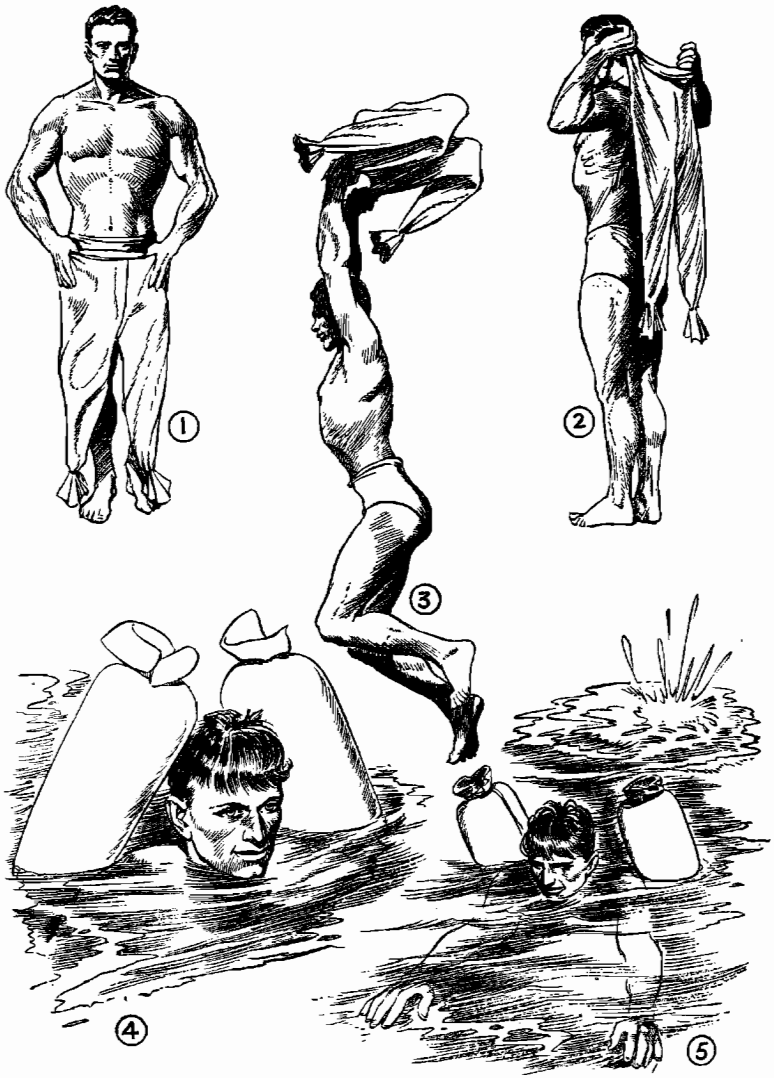

Figure 10.—Trousers Used As a Life Preserver.

ing the water, the trousers are inflated. If time and facilities permit, wet the trousers thoroughly before inflation—this enables them to hold air better.

Recruits at the San Diego station are also trained to remove their trousers while in the water and prepare them for life preservers. The trousers are slipped off and the overhand knot is tied in the end of each trouser leg. The trousers are then brought quickly over the head at arms' length, from back to front, thereby inflating them with equal efficiency.

Tests have been made which prove that inflated trousers will hold a man's weight in water for as long as 2 hours. By re-inflating the trousers, the time can be extended as long as the man can repeat the inflating process.

To float or swim, after the trousers are inflated, the man places the inverted crotch of the trousers under his arms and chest.

Khaki cloth will hold air better than the more porous navy blue trousers. The navy white and khaki have about the same inflation value.

Section IV. HOW NEW ZEALAND TROOPS PENETRATE WIRE OBSTACLES

New Zealand troops have successfully used the following methods of getting through wire obstacles in the Middle East. In considering this report, the reader should keep in mind that it refers to a New Zealand rifle company which, in approaching enemy wire, has two platoons forward. Each platoon has its three sections forward, also. Nos. 3 and 4 of each section carry wire cutters.

a. Triple Concertina Fence

As the leading sections approach a triple fence of concertina wire, they deploy into a line and lie down about 10 to 15 yards from the wire. Nos. 3 and 4, under covering fire from supporting weapons, or from the section's own light machine guns, dash forward and throw themselves—relaxed—against two adjoining pickets. Screw pickets normally will bend under the weight, and the fence will partly go down. If a strand of barbed wire runs through all the concertina loops, and is tied to the pickets, it may have to be cut.

No. 5 man runs forward almost simultaneously, and, with his rifle held well in front of him at high port, hurls himself full-length against the length of wire between the pickets. As a result, the whole stretch of wire flattens almost to the ground.

Nos. 1 and 2, with their light machine gun, move quickly and carefully through the gap, and lie down about 10 to 15 yards past the wire. The section commander and the remaining men follow closely, lying down deployed in line, with Nos. 3, 4, and 5 joining Nos. 1 and 2. If necessary, the light machine gun gives covering fire while the rest of the section comes through. Simultaneously, all other forward sections are doing the same, and should be ready to resume their attack. If the wires are not tied, two men may be sufficient to crash the fence between pickets.

b. Double Apron Fence

In approaching a double apron fence, the sections follow the method outlined above. Nos. 3 and 4 throw themselves at the pickets (whether screw, angle-iron, or wood), with rifle at high port. These men quickly cut the top wire and any other fence wires that are tied to the pickets. No. 5 then dashes forward as before, throwing himself, with rifle held well out to protect his face, onto the stretch of wire between the pickets. All these men should throw themselves boldly, but with muscles relaxed. The section then hurries through

the gap and deploys as before, ready to continue the attack.

Another method is for Nos. 3 and 4 to jump into the wire, cut the top few strands, and then fall on the remaining wire to make it sag, the section moving through as before.

c. Two Double Apron Fences, Close Together

The procedure described in sub-paragraph b, above, is followed, except that Nos. 5 and 6 crash down the second fence.

d. Combined Wire Obstacles

Sometimes troops encounter the combination of a double apron fence, a triple concertina fence, and another double apron fence—all close together. In breaking through these combined obstacles, six men are used, two per fence, who jump in, cut wires if necessary, and crash down on the fence. Here, as in the situation covered by sub-paragraph c, it may be advisable for the platoon to be divided so that only two gaps are made, instead of one per section. Two adjoining sections can then go through one gap; the remaining section, together with platoon headquarters, can go through the other. A definite method should be practiced and adopted by each unit.

Wiring gloves are advised for Nos. 3 and 4, but are not essential inasmuch as the rifle will bear the brunt of the contact with the wire. Burlap or some similar

protection can be used around the hands, if necessary. It can be wrapped around the knees, also, if the men are in shorts. It is emphasized that this is not essential, however. Every man must realize the importance of speed, and must feel strongly determined to get through the wire.

e. Comment

The time in which a forward platoon gets through wire varies from 6 seconds, in the case of troops encountering triple concertinas, to less than a minute in the case of troops encountering the combined wire obstacles. Under cover of artillery and medium machine-gun fire, an entire forward battalion has succeeded in getting through wire in 2 minutes and immediately continuing the attack.