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PART ONE: JAPAN

Section I. JAPANESE WARFARE AS SEEN BY U. S. OBSERVERS

1. INTRODUCTION

The comments carried in this section are made by observers who have been in the Southwest Pacific theater of operations, and by officers and enlisted men who have participated in the actual fighting. The comments have been edited to eliminate repetition and, as far as possible, to arrange the information according to subject matter.

2. THE JAPANESE SOLDIER

In my opinion, the Japanese soldier is a well-trained, well-equipped, and well-disciplined fighting man. He is in good physical condition, is infinitely patient, and shows a sacrificial devotion to duty. The Japanese is only a fair small-arms shot, but is proficient in the use of mortars and artillery. He uses large quantities of hand grenades.

Japanese soldiers have been trained to create fear in the hearts of their opponents, and they exploit to the utmost the

advantage gained thereby. Although they prefer to conduct the offensive on a dark night or just at dawn, they have fallen far short of mastering the technique of night fighting.

The individual soldier is an expert camoufleur, well-trained in the most effective use of natural camouflage materials. He does a large amount of close-in fighting, but is not exceptionally proficient in the use of the bayonet or in hand-to-hand combat. He is not endowed with superhuman qualities.

The greatest weakness of the Japanese fighting man is his inability to cope effectively with unexpected situations. Although he is a very efficient cog in a war machine and follows a definite plan even to minute details, he is sorely lacking in resourcefulness and ready adaptability to rapidly changing situations. No amount of training can remedy this defect of the Japanese soldier; it is an inherent weakness which is at least partly the result of having led a closely regimented life in which free thinking and individual initiative have been discouraged. This weakness is apparent both in offensive and defensive situations. When attacking, the Japanese soldier makes extensive use of weird, piercing shrieks and of threatening cries such as "Marine, you die!" The obvious intent of this practice is to demoralize his opponent and also to boost his own morale. The result expected is a disorderly, confused flight to the rear. When, however, the Japanese soldier's opponent holds his ground unwaveringly, even in the face of heavy casualties, the Jap himself becomes disorganized and confused, and is then quite vulnerable to a counterattack. If, after being repulsed in the initial attack, he decides to try again, he will probably employ identical tactics.

The Japanese's well established custom of preparing his evening meal just at dusk and his morning meal at dawn offers an opportunity for catching him in known bivouac areas with concentrated artillery fire.

Our troops should understand that the Japanese is no better able to go without food than we are, that his stamina is no better than our own (provided we have taken the necessary steps to insure top physical condition), that the Jap gets just as wet when it rains, and that he suffers just as much, if not more, from malaria, dysentery, dengue, ringworm, and other forms of tropical ills. This has been amply borne out by the condition of prisoners captured in this area, and by the finding of dead who had literally starved to death.

To the Japanese, machines of war—from the heavy machine guns to the tank—are only incidentals in warfare. We Americans realize that the infantry must perform the tasks of actually taking over the ground and holding it, but we use every available machine of war to prevent unnecessary losses. In contrast, the Japanese do not conceive of substituting the shock action of war machines for the shock action of infantry, and they merely strengthen the shock action of troops by the assistance of the machines. The Japanese Army is an army of men, supported by machines of war; ours is an army using machines of war. This is a fine distinction and perhaps not readily understood, but every statement of Japanese military policy bears this out.

A Japanese who has not tasted defeat will attack with a dash and a magnificent disregard for himself. When he has been set back on his heels, just once, he loses that zip and comes back without confidence and impelled by a morbid feeling toward death that might be worded as "Come on, let's get it over with."

He has found himself up against things he can't understand: For example, the way we use artillery (the Chinese never used it against him like that, and he doesn't know what to do about it); the fact that we prefer to sit back and stop him with well aimed rifle and machine-gun fire, and not fight it out with the bayonet; the fact that when we meet him with a bayonet we

don't break and run; and, above all, the fact that his basic idea—that skill, bravery, and cold steel alone will win the war—is wrong.

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3. OFFENSE

a. During the Day

On gaining contact along a road or trail in jungle country, Japanese forces in New Guinea usually followed a certain pattern of tactics.

First, the commander rapidly advanced specially selected, trained, and equipped troops, who corresponded to our advance guard.

When these forward troops gained contact with the opposition, they took up a position astride the road or track and endeavored to pin down the opposing forces with the support of machine guns and mortar fire.

Next, these forward troops used various ruses and demonstrations in an attempt to scare the opposition into a withdrawal, or into revealing the strength, extent, and location of their position by premature movement and firing.

If our troops did not withdraw, Japanese elements in rear of their forward group tried to by-pass our positions by infiltrating or stalking around one or both flanks as speedily as possible.

A stalk is carried out by a chain of men moving by a series of sidesteps. The sidesteps are made quickly, and, between steps, bodies are motionless as statues and eyes are glued on the objective. Fire is opened only when a target is seen.

These forward Japanese groups can usually be easily disposed of if our troops withhold their fire until a suitable target presents itself. There are numerous instances when Japanese advance elements were permitted to pass by and the larger rear elements were accounted for by rifle or machine-gun fire.

Upon first contact (in New Guinea), the Japanese would site a machine gun behind cover and fire along the track or road. This gun usually was well protected by riflemen and difficult to dislodge. The primary mission of this group was to protect and aid the advances of their forward group, but they periodically tested the strength and location of their opposition by feints and by deliberate attack.

They made feints and rapid advances, affording just fleeting glimpses, in order to draw the fire of our troops and thus determine our location and strength. By firing at these fleeting targets, our troops would immediately draw a heavy return fire by a group which was placed for that purpose.

To test the possibility of further advance, the Japanese would send men forward along the track or road under cover of fire from rifles, machine guns, and mortars. They placed much confidence in the effect of sound and apparently did considerable firing for this reason.

If the Japanese fail in their first attempt on a position, they seem to bring their forward lines right up to within 50 yards of ours wherever possible. (Hence the importance of being able to dig in.)

In many instances, the Japanese have not hesitated to send troop elements into areas where it was next to impossible to secure their return or even to supply them. As a result, some of the deep infiltrations of their troops have failed because of food shortages.

Unless fields of fire have been cut, it is almost impossible to stop Japanese infiltration through jungle.

If you are assigned to do some sniping, you should first seek concealment and then a field of fire. The Japanese does exactly that. Whenever one of the sniper trees is at the end of a little lane or clear strip in the jungle, look out. The turn of a trail, or the turn of a dry stream bed are ideal spots for snipers.

The Japanese have two favorite maneuvers. The first is an envelopment over "impassable" terrain by which he hopes to force the opposition to withdraw because of threats on one or both flanks. Little actual fighting is anticipated. (Their actual attack is usually made on a very narrow front, and, as a consequence, in great depth; this makes them particularly vulnerable to artillery fire.)

Their second favorite maneuver is what has been called a "filleting" attack. It is like filleting a fish—removing the backbone so that the rest can be cut into convenient pieces. In this type of attack, they rush down an arterial supply route with tanks, followed by a dense mass of infantry, on the assumption that, by holding the road and denying us the use of it, we will be forced to withdraw. If they gain this end without fighting, they are highly successful, but if they have to fight they are at a decided disadvantage—not only are they highly vulnerable to artillery fire (the dense mass, in depth, with no maneuver space) but, if our troops are up to it, the Japs are vulnerable to a single or double envelopment.

All Japanese operations indicate the tendency to follow a set doctrine without the ability to readjust for changing circumstances. Despite a failure which involved terrific losses, they have repeated the same operation over and over again without attempting to figure out something new.

The Japanese bayonet assaults have been reported as a terrifying attack—but all our units on Guadalcanal loved them. The Jap practice of singing his *Banzai* song for about 5 minutes prior to his assault has simply been a signal for our troops to load a fresh belt of ammunition in the machine guns, put new clips in rifles and BAR's, and to call for the Tommy gunners to get in position.

In their attack on prepared positions the Japanese have used a more or less standard procedure. Prior to the attack they

make every effort, by reconnaissance and ruses, to determine our strength and location and a "soft spot."

After the Japanese have selected their point of attack, they persist in attacking this point in an effort to break through. Should these efforts fail, they sometimes shift to another point but usually return to their original point of attack. Thus, as experience along the Kokoda Trail (New Guinea) indicates, we should not appreciably weaken our defense in the sector originally attacked in order to aid in the defense of some point subsequently attacked.

In the Japanese attacks along the Kokoda Trail, the following points were noted:

During their attacks it was not uncommon for the Japanese to replace their forward troops with fresh forces, a few at a time. This was done efficiently and without confusion.

When the Japanese were held up, they immediately dug in for protection. There were slit trenches and foxholes all along their line of retreat on the Kokoda Trail.

b. At Night

The Japanese selected night-attack objectives by observing our dispositions at sunset. If they failed to find these objectives where they expected them to be, they became confused in the dark because they did not know where to look for us. It would take the Japs about an hour or two to reorganize—this interval was the best time to attack them.

In their night attacks, the Japanese sent advance parties through the dense cover of valleys; they reserved the more open terrain of the higher ground for the main body to approach and make the main effort. To cover up the noises made by the advance parties, the main body purposely made noises as it approached.

Frequently the advance parties cleared away jungle growth on terrain over which large units were to approach, spreading luminous paint along the "blazed" trail as a guide.

4. DEFENSE

a. Enemy Tenacity

It would be impossible to overstress the tenacity with which the Japanese clung to their prepared positions (in the Buna area). Ordinary grenades, gun, and mortar fire were completely ineffective. There were many instances where dugouts were grenaded inside, covered with gasoline and burned, and then sealed with dirt and sand, only to yield—two or three days later—Japanese, who came out fighting. One souvenir hunter, entering a dugout that had been sealed for 4 days, was chased out by a Japanese officer armed with a sword.

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b. Enemy Positions

The enemy bunkers and dugouts were constructed of coconut palm logs, dirt, sand, and sand bags, covered with natural camouflage. In some instances, pieces of armor plate were set up. The log-and-dirt bunker construction was done carefully and strongly. The corner posts were firmly embedded in the ground, and the horizontal logs neatly and strongly attached and interwoven. Several alternate layers of logs and earth were generally used, to give full protection against mortars and light artillery. Roofs were thick; they were made of alternative layers which gave excellent protection. No concrete positions were found.

The bunkers were connected to systems of fire and communication trenches radiating on both sides. In some instances, underground trenches were constructed. These were used by snipers to

infiltrate into our midst, even after the enemy units had long been driven from the general ground. Leaves and grass were well used to camouflage all bunkers. The bunkers had been planned and built for just this purpose long before the campaign actually started, and the naturally quick jungle growth, sprouting up over the earthworks, gave first-class natural camouflage.

The enemy dugout positions were well sited and mutually supporting. It was extremely difficult, if not impossible, to bypass any of the positions, each of which had to be reduced in turn.

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c. Enemy Tactics

The Japanese is good at organizing ground with automatic weapons, and usually covers approaches into his position by well placed, mutually supporting fires. They usually hold their fire when the first targets appear—they wait for bigger game. They have allowed platoons, or even companies to infiltrate past their positions—so they could cut them off from the rear. It must be recognized, however, that the Jap will seldom leave his position, even when completely outflanked, and that he must be reached and killed. However, in spite of his cleverness at concealment and covering avenues of approach, he seldom, if ever, traverses or searches with his machine gun, and therein lies the key to his destruction. He is also prone to organize ravines and reverse slopes, in direct contrast to our practice of occupying the military crest of ridge lines.

Imbued with the offensive idea, the Japanese naturally attempts frequent counterattacks, probably based upon some form of mobile reserve. "On one occasion," wrote an Australian officer, "when our attack drove the Jap out, he appeared to become panicky, running from side to side and firing wildly with every-

thing he had; however, a short time later our troops were forced to withdraw by the weight of a counterattack, made by a mobile force in reserve."

An Australian account of Japanese defensive operations in the Owen Stanley Mountains of New Guinea says:

The action fought between Myola and Templeton's Crossing was along a narrow ridge, on the crest of which runs the main track. The whole length of the ridge is covered by dense jungle, which in some parts consist mostly of bamboo.

When first contacted, the enemy withdrew up a ridge on which he had prepared defensive positions. All approaches to the positions were covered by fire and well camouflaged. Circular, one-man pits were used by each individual soldier. These pits were 2 to 3 feet across and afforded good protection, especially from grenades.

It appears that the Japanese keeps his head down and fires burst after burst from his machine gun, blindly spraying the area in front and below his position to create a lot of noise in an attempt to intimidate the attacker.

Machine-gun posts covering the main track were cunningly chosen for position and field of fire. Natural camouflage, such as the butt of a large rotting tree with flanged roots, or a small natural ridge beside the track, were used to advantage. The positions were well sited for all-around protection.

The Japanese used medium and light machine guns as their main defense; a few riflemen moved to points of vantage as our troops went forward. Hand and discharger grenades were used extensively.

The Japanese likes to move his light machine gun or medium machine gun from place to place during the day. One of our officers, after a reconnaissance, was quite certain that there was no automatic weapon in one position, but when we attacked,

shortly afterwards a machine gun opened up at the first indication of movement by our troops.

d. On Makin Island

In their raid on Makin Island, U. S. Marine troops encountered a force of about 90 Japanese soldiers plus about 100 Japanese civilians.

The Japanese set-up consisted of two main positions, a number of lookout points, and a mobile reserve, which moved on bicycles and in a truck.

One of the main positions was along the edge of the beach on the south side. It consisted of a shallow trench with barbed-wire obstacles to the front.

The other main defense position extended across the island, facing the east. It included a fire trench, 2½ feet wide and 2½ feet deep, with the spoil thrown up in front. Along the trench, at intervals across the island, were four machine-gun nests. About 75 yards east of the trench, a barbed-wire fence extended across the island. To block the lone road cutting the defense line, the Japanese used portable barbed-wire "hedgehog" obstacles.

The machine guns and snipers provided the major difficulties for the Marines. The Marines flattened themselves on the ground when the machine guns opened up, but they still were exposed to snipers, who had cleverly camouflaged themselves under the fronds of palm trees off to the flanks of the machine guns. The snipers were dressed in a jungle green uniform; some used individual camouflage nets while others hung coconuts all over their body. They were almost impossible to see until they moved, or the fronds were shot away. One sniper had the tops of two trees tied together, and when spotted he cut the trees loose, making it hard to decide which tree he was in.

These snipers tried to pick out troop leaders and radio men.

The Marines took care of the snipers first and then knocked out the machine-gun nests. The guns were well sited as to fields of fire and were well concealed.

5. DUMMY SNIPERS (New Guinea)

A patrol advancing up the coast was fired on by a tall tree-top sniper. They halted, located him, and apparently shot him down. They then advanced and were fired on again. This happened several times. Thorough investigation revealed that one sniper had been holding up the patrol and dummies had been placed in other trees. These are dropped by a pulley arrangement after the Americans had fired a number of shots. This made them imagine that they had cleared the opposition.

In another case, the sniper's dummy was rigged so that it could be pulled back up into place. The sniper made the mistake of pulling it back up too soon, giving away his ruse. The sniper, incidentally, showed very poor marksmanship.

6. RUSES

The Japanese have used the following ruses in the New Guinea fighting:

a. They dragged a dead United Nations soldier close to our lines and propped him up, expecting that a group of our troops would be sent out to "rescue" him.

b. With the same purpose, they placed captured weapons in front of our forces.

c. They fired captured weapons to give the impression that our troops were at the places where the weapons were sited.

d. Over their hats, they wore cut-out circular boards to imitate Australian hats.

e. They scattered cast-off garments and equipment on a trail to give the impression they had fled in disorder—actually it was an attempt to ambush our forces.

f. They shook bushes and talked loudly in an attempt to draw our fire.

7. SUPPLY ON GUADALCANAL

The serious supply difficulties which confronted the Japanese on Guadalcanal were brought about, to a large degree, by poor distribution and planning. On the same days, we continually encountered Japanese soldiers who were "round-faced and well fed" and those who were emaciated and starving.

This situation was believed to have been due to Japanese overoptimism regarding the outcome of planned attacks. This optimism was transmitted to supply echelons; the Japs had to win a victory on schedule so that their supply operations would continue functioning adequately. One unit that attacked Henderson Field, Sept. 12, 1942, carried only three day's ration, with no reserve in the rear. Consequently, the few who survived the attack were immediately faced with a food shortage.

The Japanese adopted the system of having each company send carriers back for rations, which were then carried forward. Because of the rough terrain and our air operations, this round trip took as long as 2 or 3 days. These efforts did not provide a full ration for the units, so the men were put on reduced rations. This, plus the strain of jungle operations, made the soldiers easy marks for malaria, beri beri, and diarrhea. Eventually the condition became so bad in some units that half-sick men were sent to carry rations and the journey took a correspondingly longer time.

Air transportation of food to these troops was attempted with limited success. Late in January, 25 parachutes of food and supplies were dropped to units in the jungle. The parachutes were strafed by our planes, starting some fires, so it is believed only part of the supplies were received by the troops.

The Japanese used all available types of native foods. Ant nests were reported as very good eating by one Japanese soldier. Their forces in New Guinea turned to horse meat when food supplies became low. The meat was processed and issued under the direction of a high echelon.

Although all varieties of food were used by the enemy on Guadalcanal, the normal issue was field rations and dehydrated foods, including powdered eggs. It is doubtful if perishable food was issued to front-line troops, but some was obtained. In some cases food was buried in the field cemeteries for safekeeping.

Stealing of food became quite common. Ration dumps required extra guards and special precautions. Towards the end, the situation became so bad that an emergency courtmartial was appointed to deal with the special cases of stealing rations, and this court had instructions from the appointing officer to inflict drastic punishment. Rations were reported as being frequently stolen from carriers en route to the front.

Section II. GRENADE DISCHARGERS

1. GENERAL

To date, two types of grenade dischargers, both 50-mm, have been used by the Japanese. One is known as Model 89, heavy grenade thrower, and the other as the "10-year" type. These have been erroneously referred to as "knee mortars." They have a small attached base plate, designed to rest on the ground or any solid object while firing—never on a soldier's knee or thigh. A Marine on Guadalcanal fired one of the dischargers from his thigh, and his upper leg bone was broken by the force of the recoil.

The Japanese are using both types of dischargers in the South Pacific fighting, and a number of them have been captured by our forces. Studies and experiments with both types have been made by the U. S. Ordnance Department, and the information in this section is based on the Ordnance findings. The dischargers were found to be very effective, easily carried, simple in design, and easy to manufacture. Designed for use by the individual soldier, they bridge the "gap" between hand grenades and regular mortar fire.

2. MODEL 89

a. Description

The Model 89 was perfected in 1929, and is considered to be an improvement over the earlier (1921) model.

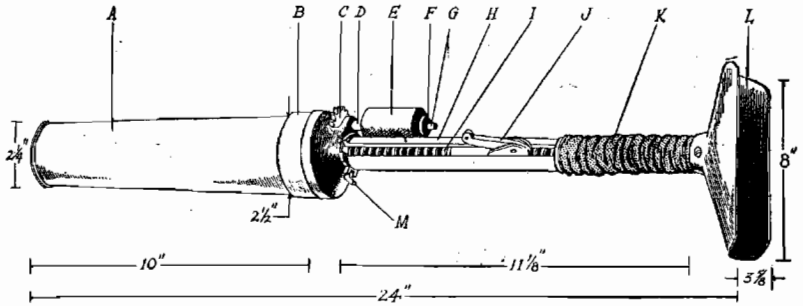
All component parts of the Model 89 (see fig. 1) are made of steel. It is constructed in the form of a pipe-like, rifled barrel, which is attached to a small base plate. The plate is so shaped on the bottom that it could fit over a medium-sized tree trunk or log. The trigger housing is a tubular piece of metal with a lengthwise slot. Protruding through this slot, the trigger cocks and fires in one operation. A spring sleeve covers the trigger housing at the base plate. A range-adjusting assembly is attached to the base cup of the barrel.

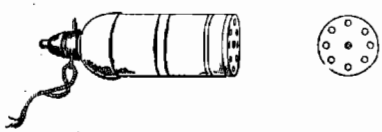
b. Table of Characteristics

Caliber	50 mm (1.97 in)
Length (over-all)	24 in
Length of barrel	10 in
Weight	10¼ lbs
Range	65 to 700 yds
Weight of projectile	1 lb 12 oz
Barrel	Rifled

c. How It Operates

The discharger has range scales on both sides of the lengthwise trigger slot, and the weapon can be set at the desired range by turning the range-adjusting knob. When the knob is turned, it lengthens or shortens the





A. Barrel
B. Base Cup
C. Range-Adjusting Cogwheel
D. Screw Bushing
E. Range-Adjusting Knob
F. Nut
G. Adjusting Shaft
H. Trigger Housing
I. Range-Adjusting Worm
J. Trigger
K. Spring Sleeve
L. Base Plate
M. Barrel Lock

Figure 1.—Japanese Model 89 Grenade Discharger and Ammunition. (The correct position for firing is shown in the bottom view.)

worm housing inside the barrel of the discharger. Thus, the range of the weapon can be regulated by lengthening or decreasing the distance traveled by the projectile through the barrel. The weapon can be fired from the ground or any other solid base.

An angle of about 45 degrees is believed to be the most effective position of the discharger for firing. It has no sight except a grooved line which extends from the muzzle for a short distance down the barrel. Preparatory to operation, a grenade is placed in the barrel and allowed to drop to the firing housing, where it remains until fired. When the operator pulls the trigger (by pulling a short leather lanyard which is fastened to the trigger), the following action takes place: Cogs in the trigger move the firing-pin housing forward by engaging cogs in front of the housing; this causes the firing-pin spring to be compressed. As this action takes place, the tang on the cocking piece engages against the cocking lug of the firing-pin shaft. A continued pull on the trigger allows the cocking piece to become disengaged from the cocking lug, and the tension of the firing-pin spring, upon being released, sends the firing pin forward and sets off the propelling charge.

3. '10-YEAR' TYPE

a. Description

This discharger, also constructed entirely of steel, was perfected in 1921. It is still being used by the

Japanese, mainly for firing signal pyrotechnics into the air. It also fires a fragmentation-type grenade.

The weapon is muzzle-loaded, and is fired by a striker which is operated by a lever on the outside of the discharger body. Like the newer type, the 1921 model is fired while attached to a small base plate. No bipod attachments are used.

The discharger fires grenades that weigh nearly 1 pound. A special attachment containing the propelling charge and percussion cap is screwed into the grenade base.

b. Table of Characteristics

Caliber	50 mm (1.97 in)
Length (over-all)	20 in (about)
Length of barrel	9½ in
Weight	5¼ lbs
Range	65 to 250 yds
Barrel	Smooth bore
Transport	Carried on the man
Weight of grenade	1 lb

c. How It Operates

The weapon is fired by a trigger that is attached to the bolt housing. When the trigger is pulled, the following action takes place:

The trigger pin rotates in a notch, and the trigger lips compress the firing spring by engaging and forcing the cocking-piece sleeve forward on the firing-spring guide.

When the sear has rotated approximately one-half the way back, it slips off the notch and releases the firing-spring guide, which jumps forward because the firing spring is compressed. Thus the firing pin contacts the primer. When the trigger is released, the firing spring—which still has a slight tension—forces the trigger back into position to be fired again.

Upon being released, the sear moves back over the notch, which has a small leaf spring that depresses and also allows the notch to move downward. This latter movement allows the sear to go back to its original position so that the piece can be fired again.

This complete operation takes place each time the trigger is pulled, since the firing mechanism is of the continuous-pull type.

The range-control gauge governs the range of the projectile by the opening or closing of a gas port in the base of the barrel. This gauge can decrease or increase the force of gas expansion in the barrel, thereby regulating the range. By opening the gas port to its fullest extent, the range is decreased to its minimum; by closing the port, the range is increased to its maximum. (The elevation also must be taken into consideration.)

4. AMMUNITION

a. For Model 89

Only the 50-mm high explosive type of grenade projectile was available to the Ordnance Department

for examination. However, the Model 89 is believed to be designed to fire gas or smoke projectiles as well as high explosives.

The effective bursting radius of the high-explosive shell was found to be 30 feet. The explosion caused 211 impressions on a low-panel bursting range used by the Ordnance Department in conducting the tests.

The grenades received to date were painted with black enamel, with a ¼-inch red stripe at the head and a 5/16-inch yellow band around the center of the grenade body. Each round was wrapped, unfuzed, in water-resistant paper with a plastic-closing plug. The fuze accompanying each round was wrapped in paper and excelsior and separately contained in a small tin can.

The projectile consists of three major parts, the fuze, the body, and the propelling charge. The fuze is of a simple point-detonating type with a pin safety. After the pin is pulled out, the fuze is armed by a setback and centrifugal force on firing from the discharger.

The body of the projectile is made of mild steel. It serves as a receptacle for .31 pound of TNT-type explosive filler.

The propelling charge consists of the percussion cap, propellant, and an expanding copper rotating band. This unit is assembled to the body by a screw thread, and is fired when a striker hits the percussion cap. When the firing action occurs, the expanding gases exert their force on the copper band and drive it against the rifling. This causes the projectile to rotate.

b. For "10-Year" Type

Only the high-explosive, fragmentation-type grenade projectile was available to the Ordnance Department for study in connection with the "10-year"-type discharger. This projectile is the standard Japanese hand grenade with a modification enabling a propelling charge to be added to it.

The range of this smooth-bore ammunition is reported to be 65 to 200 yards, depending on the adjustment of the gas port of the discharger. No determination of ballistic data could be made because of the lack of sufficient ammunition to conduct a firing program.

No distinctive markings were found on the grenade examined.

Like the projectile for the Model 89 discharger, the grenade for the 10-year type consists of three main parts, the fuze, the body, and the propelling charge. The fuze is of a simple firing-pin-initiated, powder-delay type with a pin safety. The delay is approximately 7.5 seconds. However, it is reported that when this fuze is used in the discharger, it will also detonate upon impact. To arm and use as a hand grenade, simply pull out the safety pin and hit the firing pin a smart blow. When fired from the discharger, the pin is pulled out, and it is reported that the fuze will arm on setback. Sufficient ammunition was not available to check this statement.

The body consists of a mild steel filler-cap plug and a cast-iron body proper. The body serves as a receptacle for approximately 3 ounces of what appears to be TNT explosive filler. To it is affixed the filler cap and propelling charge.

The propelling charge consists of a percussion cap and propellant. When the firing pin strikes the percussion cap, the propellant is ignited and fires the grenade.

Section III. JAPANESE EQUIPMENT

1. INTRODUCTION

The comprehensive list of Japanese equipment given below was carried by a part of the Yokosuka 5th Special Landing Party, which took part in the Southwest Pacific fighting. This list of equipment represents about what a company of 250 to 275 men would carry.

2. THE LIST

Description	*Quantity*
Model 93 13-mm MG	2
Model 92 7.7-mm Hv MG	4 (with accessories and extra parts)
Model 96 6.5-mm LMG	11
Model 38 rifle (with accessories and spare parts)	172 (include 2 in reserve)
Model 89 heavy grenade thrower.	10
Model 14 pistol	66 (with accessories and spare parts)
Model 100 flame thrower	5
Model 93 13-mm ordinary Am	7,454
Model 93 tracer Am	3,476

Model 94 HMG ordinary Am	24,000
Model 94 tracer ordinary Am	6,000
Model 94 armor-piercing Am	6,000
Model 96 LMG Am	110,000
Model 38 rifle Am	102,000
Model 14 pistol Am	2,640
Model 89 heavy grenade-thrower shells	700
Model 89 heavy grenade-thrower smoke shells.	100
Model 91 hand grenade	980
10 Kg smoke candles	15
1 Kg smoke candles	200
Rifle grenade shell (ordinary)	60
Rifle smoke shell	60
Model 95 collapsible boat	5 (with accessories)
Barge for transporting bombs	1
Wire entanglements	8,202 ft
MG carriage, type 2, revised No. 1	1
Portable phone	8 (with accessories)
Detector equipment	1
Detector equipment for scout use	5
Rifle barrels	25
No. 2 bullet-proof jacket	100
Wire cutter	35
Small shovels	125
Small picks	20
Triangle tents A	3
Double tent	2
Smoke screen float	236
Sandbags	3,500
Model 93, No. 3 gas mask	270
Life jacket (merchant-ship type)	57
Life jacket (warship type)	209
Portable pump	1

Small B fire extinguisher	4	
Large B fire extinguisher	8	
Fire axe	3	
Model 92 Very pistol	4	
Model 41 signaling lamp (new type)	1	
Signaling rocket (new type)	5	
Portable signaling lamp	12	
Blasting powder (use on land)	40	
Model 99 demolition bombs	4	
Portable gasoline, direct-current charging generator 1 KW–105V, with the electric distributing equipment.	1	
TM type, portable wireless telegraph (new type 2).	2	(with accessories and spare parts)
D1 code book	1	(with number of dispatch tags and reception tags)
Rations—for about 1½ months.		
Canteen goods—for about 1½ months.		
Model 93 13-mm MG (auxiliary parts) light armament.	3	
Model 93 13-mm MG, arm rack Type 6	3	
Model 93 13-mm double combined armament MG.	2	
1 set Model 93 13-mm double combined armament MG arm rack.	1	
Ordinary ammunition	22,454	rounds
Tracer ammunition	8,976	rounds

Section IV. INFORMATION OBTAINED FROM JAPANESE PRISONERS

1. INTRODUCTION

All the information given in this section was obtained from Japanese prisoners; therefore, it is not necessarily correct in all particulars, and should be treated with reserve. The comments are presented according to subject matter.

2. THE COMMENTS

a. Regarding Morale

Several prisoners have stated that they were opposed to going to war against the United States and Great Britain. One prisoner remarked that Japanese soldiers and sailors were talking among themselves about the prospects of losing the war. He said there was considerable fear of Russia "turning on Japan and using Vladivostok as a base for bombing operations."

At least two prisoners deserted because of difficulties with their commanding officers. One of them, suffering from malaria and confined at a rest camp in New

Guinea, declared that his superior officer accused him of "gold-bricking" and "kicked, pushed, and beat me." He intimated that this treatment made him so miserable he went into the jungle and wandered three days until he reached the Australian lines.

Another prisoner wandered off into the jungle toward the U. S. lines on Guadalcanal after his commanding officer had reprimanded him because he asked for more rice than the individual rationed allotment. He was captured by natives while stealing food, and was turned over to U. S. troops.

When asked what he thought about fighting the war, the prisoner replied that he didn't think—he just followed orders. He refused to write home, and said he would like to settle in the United States after the war is over.

There is a difference of opinion among prisoners as to their reception in Japan after the war. Most of the prisoners have insisted that it is a life-time disgrace to be captured. One prisoner questioned recently declared that all those captured would be killed when they were returned to their country. He said that even his own father and mother would not receive him. However, he intimated that there might be a possibility of some kind of adjustment.

Another prisoner thought he would be able to return and live a normal life provided he did not resettle in his native district.

In regard to "saving face," another prisoner stated that the correct procedure for the commander of a badly defeated regiment would be to return to the district where his unit was formed and commit suicide.

According to one prisoner's story, Japanese enlisted men are forbidden to make allotments from their pay for dependents. In explaining this statement, the prisoner said the army felt that the enlisted men needed all of their pay to buy necessities.

Japanese soldiers may keep diaries in Japan and in other areas not close to the theater of operations, according to another prisoner. On his departure from Rabaul, the prisoner said his commanding officer read an order forbidding diaries to be taken to New Guinea or to be written there. The order did not apply to officers, he said, and noncoms in some instances could obtain permission to keep diaries.

b. Regarding Equipment

(1) *Collapsible Boats.*—One prisoner described a collapsible boat made of wood and reinforced with rubber. The boat, according to the prisoner, was constructed in four independent and water-tight sections, which hook together. The hooked joints were reinforced with rubber. The maximum capacity for the boat is 10 men.

Another prisoner described a collapsible rubber boat, which was inflated by a foot pump. The floor of the boat was made of folding wooden slats, which were

fitted into a side frame to provide rigidity. The overall length of the boat was about 8 feet and the width about 6 feet. The inside measurements were about 5 feet by 3 feet. The boat, which weighed approximately 100 pounds, accommodated two or three men. The occupants propelled it by paddling with their hands.

(2) *For Infantry Squad.*—A prisoner said each infantry squad, of 12 men, carried the following: 4 shovels, 1 axe, 1 hammer, 1 large tree saw, 3 picks, 1 hatchet, 1 pair of wire cutters, and nails and staples. He said the squad did not carry barbed wire.

(3) *Footwear.*—Before leaving Japan, each soldier is issued hobnailed shoes and rubber-soled canvas shoes, according to a prisoner. The latter are worn, he said, when leaving a ship because ordinary shoes are too slippery.

(4) *Camouflage.*—A prisoner stated that in addition to a camouflage headnet, each Japanese soldier in jungle areas is issued a pair of greenish cotton gloves.

(5) *Identification Badges.*—A prisoner explained that infantry troops are identified by a circular khaki cloth badge, 1¼ inches in diameter, which is worn above the left breast pocket. The prisoner said that the Japanese character denoting infantry was marked on the badge.

PART TWO: GERMANY

Section I. RECONNAISSANCE BY LIGHT TANK PLATOONS

1. INTRODUCTION

In German tank organizations, a light tank platoon consisting of seven Pz. Kw. 2's is an organic part both of the regimental headquarters company and the battalion headquarters company. The regimental light tank platoon is normally used for reconnaissance purposes. German doctrine covering the reconnaissance duties of patrols drawn from these platoons is summarized below. (It assumes that superior German forces are conducting an advance.)

2. THE DOCTRINE

a. Teamwork

Teamwork, the Germans point out, is the secret of successful reconnaissance. They believe that haphazardly formed reconnaissance patrols, made up of men who have never worked together before, are of little value.

b. Reconnaissance Before H-Hour

(1) *Orders.*—Orders given to light tank patrols which are to perform reconnaissance before H-hour include:

(a) Information about hostile forces and the terrain.

(b) German intentions (especially those of a patrol's own and flanking units).

(c) Composition of the patrol.

(d) Time of departure.

(e) Line of advance and objectives.

(f) Method and procedure of reporting (radio or motorcycle).

(g) Position of the patrol commander, and of the commander to whom he will report.

(h) Action to be taken on completion of task, or on meeting superior opposing forces.

It is prohibited to take written orders and situation maps on reconnaissance. Special precautions are insisted upon when markings of any kind are made on maps used on reconnaissance; these markings are required to be of a kind which will not reveal German dispositions if the maps are captured.

(2) *Information Needed Beforehand.*—For its disposition and method of work, the German patrol depends on knowing:

(a) Up to what point contact with the opposition is unlikely. (Until reaching this point, the patrol saves time by advancing rapidly and avoiding elaborate protective measures.)

(b) At what point contact is probable. (After this, increased alertness is maintained.)

(c) At what point contact is certain. (Here the patrol is ready for action.)

The patrol commander is also given necessary particulars regarding air support and information as to the attitude of the civil population.

(3) *Method of Advance.*—The light tank patrol advances rapidly from one observation point to the next, making use at first of roads and paths, but later, as it approaches hostile forces, using all available cover. When approaching villages, woods, or defiles, the patrol leaves the road in sufficient time to upset the opposition's aimed antitank-fire calculations.

(4) *Command.*—The German patrol commander makes a rapid estimate of our position, and tries to attack and overrun us if he thinks that we are weak. If such a move does not seem advisable, he attempts to discover the type and strength of the opposition encountered, without becoming involved in combat.

"Keen, capable, and well-trained officers or noncoms must be selected to command the light tank patrol," the Germans state. "These must be constituted of quick-thinking, resourceful troops who have functioned as a unit long enough to know and have confidence in their leader."

c. Reconnaissance after H-Hour

(1) *Mission.*—The mission of reconnaissance after H-hour is to explore the hostile position in detail, to

protect German deployment, and to discover hostile gun positions, as well as natural and artificial obstacles in the line of advance.

(2) *How Performed.*—The mission is carried out by light tank patrols (which may be reinforced) operating ahead or on the flanks, as in reconnaissance before H-hour. The reconnaissance tanks employed immediately ahead or to a forward flank are detailed automatically by the first wave of the attacking force. (Normally, one light tank per platoon of heavier tanks in the first wave, and always the same light tank. The remaining light tanks work behind the first wave, performing other duties.) The reconnaissance tanks advance rapidly, making for suitable high ground. They keep 300 to 500 yards ahead of the first wave, and maintain visual contact with it. The reconnaissance tanks observe from open turrets or, if fired on, through their telescopes, with turrets closed. They advance by bounds, from cover to cover, keeping the terrain ahead under continuous observation.

The tanks in the first wave, especially the Pz. Kw. 4's, cover the reconnaissance tanks as they advance.

When the reconnaissance tanks contact our infantry, they attempt to overrun us and, if they are successful, they report and continue their mission. A reconnaissance tank discovering hostile antitank weapons and artillery reports them, takes up a position, and waits for the rest of its company. While waiting, it fires on hostile antitank weapons.

Tanks are avoided, but are observed from concealed positions. The reconnaissance tanks report suitable terrain for meeting an attack by hostile tanks. As under the circumstances described in the previous paragraph, each reconnaissance tank waits for the rest of its company.

Opposition which begins to retreat is promptly attacked, the reconnaissance tanks reporting the development and continuing the pursuit.

In the event of an attack by the opposition, the reconnaissance tanks take up a position, meet the attack, report, and wait for the rest of their companies to come up.

In all these instances, the reconnaissance tanks avoid obstructing the field of fire of the heavier tanks following them. Throughout, the light tanks report by radio if it is available, by prearranged flag or smoke signals, or by significant firing or maneuvering.

Section II. COMPANY ORDERS (DEFENSE)

1. INTRODUCTION

A detailed set of German combat orders issued to a company in North Africa affords an excellent illustration of enemy defense technique, as well as insight into the way the tasks of smaller units are outlined and coordinated. Every platoon and squad, and almost every support weapon, is discussed separately and fully. For the sake of brevity, the contents of the orders are summarized and are grouped under appropriate headings.

2. INTENTIONS

The first words of the order were "The company will hold its position to the last man." Each sub-unit received its own assignment. The left platoon was to "neutralize and destroy the attacking enemy" [British]. The right platoon was already in its assigned position, where it had received its orders; the heavy mortar section had already been given two prearranged fire plans for the two halves of its front; the

antitank rifle 41 was not to engage British armored vehicles at more than 200 yards; the antitank guns were to bring the British tanks to a standstill in front of the main line of the company defensive area; and company headquarters was to use all available personnel to form a strongpoint (*Stutzpunkt*) in the event of an enemy penetration (*Einbruch*).

As is customary in German orders, the information given under "Intentions" contained a few tactical hints, as well. Thus the left platoon was encouraged to site its reserve machine guns in an enfiladed position, and its reserve squad was to fire between the forward squads. The right platoon was to have a listening post near the fence which surrounded the position; the post would withdraw as soon as the British attacked. The machine guns were to open up without orders as soon as they observed an attack developing. Designated snipers were to aim at commanders. The reserve machine guns were instructed to fire between the forward squads, and the remainder of the reserve was to give supporting fire in depth. The center platoon's fourth squad was to become a "counterattack group" and was not to open fire except to deal with British troops who had actually penetrated. The center platoon's antitank rifle was forward, between the center and right squads. The heavy mortar squad was reminded of the customary role of the mortar, and was advised to fire with the sun at its back. The antitank gun was given the

ranges beyond which it was not to fire—namely, 200 to 300 yards in the case of medium and heavy tanks, and 600 yards in the case of light tanks. For reasons of concealment, firing at British ground positions was forbidden. The antitank gun commander was ordered to observe the fall of his fire from a flank position, and the ammunition handlers, except when they were needed for their normal duties, were to join in the infantry fire fight. During action, all-around observation was to be maintained. The gun commander was instructed to prepare a range card, and to require his crew to learn it by heart.

3. DEFENSES

The company's position was apparently surrounded by a single-apron or double-apron fence. The British positions (given separately in each sub-unit's orders) were from 150 to 450 yards away. On the German side of the wire, the arrangement of the minefield appears to have varied. The left platoon's minefield consisted of a row of booby traps 3 to 4 yards from the wire, a minefield proper 40 yards behind this (3 to 4 yards between rows, 2 to 5 feet between mines), and three independent mines between the two fields. The right platoon's minefield consisted of four rows spaced alternately (4 yards between rows and 5 rows between mines). The center platoon's minefield was known only vaguely to the company commander, but in front

of its right squad the minefield was 30 yards from the fence.

The left platoon had a trip-wire in front of its fence, but no explosives in the fence itself; the right platoon had explosive charges hung in the fence, and these were detonated by a cord from the position; the center platoon had four to six grenades in its portion of the fence, to be fired in the same way.

From the orders, it seems evident that the details of siting minefields and booby traps were left to the discretion of individual platoon commanders.

4. POSITIONS

The left platoon's position was not described in the orders, but its total frontage was given as 300 yards. Attached to the center squad was the antitank rifle, model 41, covering a sector which ran through the whole position.

The right platoon's position consisted of three trench systems, arranged like a wide arrowhead. The squad occupying the trench system at the left had an antitank rifle. A reserve section was held at platoon headquarters with runners, and with the reserve (fifth) machine gun and antitank rifle.

The center platoon had three squads forward, while the fourth was 130 yards southwest of platoon headquarters. The heavy mortar squad had an observation post between two of the forward squads and a fire

position 500 yards in rear of the observation post (and 80 yards to the right of company headquarters).

There was no indication of the position of the antitank gun.

5. SENTRY SYSTEM

The left platoon had two men on guard by day. At night (from 1900 to 0600 hours), there were two men per machine gun and two men in each of the listening posts put out by the three forward squads.

The right platoon had one post per position (including platoon headquarters) by day, and at night two men per machine gun plus two sentries, who were allowed to rest in the position but who were required to know the light signals and the password.

The center platoon had one observation post per squad manned by day, with the "counterattack group" manning an observation post between the center and right squads. At night the center platoon had two men per machine gun. One of these was to be the squad leader or his second-in-command. The antitank riflemen maintained one man in a position between the center and right squads. On the left (open) flank, all squads in turn maintained two men with grenades in an abandoned antitank gun-pit northwest of platoon headquarters. The heavy mortar squad was to keep one man at the mortar by day and two at night. A man remained at the antitank rifle day and

night; he was relieved every two hours. One man by day, and two at night, maintained continuous observation by the antitank gun. At dawn the gun commander was to stand to.

6. AMMUNITION

Reserves of ammunition were dumped behind or in each position. The right platoon had one "echelon" of ammunition at platoon headquarters and two "echelons" with its squads. The heavy mortar squad's ammunition was dug in near the mortar pit. The antitank rifle's ammunition was hidden in holes within a radius of 30 yards from the position. The antitank gun's ammunition was similarly hidden, but in such a way that the gun crew could lay its hands on the right kind, even at night. (There were 11 cases of armor-piercing and 4 cases of high-explosive projectiles.)

7. RATIONS

There was a warning against bunching at the issuing point. As a precaution against harassing fire by British artillery, containers were to be distributed at some distance from the vehicles which brought them forward. It was noted that 8 days' reserve rations were buried near platoon headquarters in each position.

8. INTERCOMMUNICATION

Intercommunication was normally to be by light signal or by runner. The right platoon was reminded that, in line with normal German procedure, its squad leaders were to maintain contact with their neighbors.

The antitank gun commander was told to report the day's observations and any other events to his platoon commander, at the evening ration-drawing.

9. SAFETY PRECAUTIONS

For firing on fixed lines, wooden stakes were to be driven in near each machine gun, to mark the permissible arcs of fire. (All machine guns were given definitely prescribed arcs.) The antitank rifle was permitted to fire all around at ranges of 400 yards or more; along the sector it was covering, it was allowed to engage armored vehicles at ranges as low as 200 yards.

10. GENERAL INFORMATION

Each position was told in detail the degree and types of hostile fire likely to fall on its sector, and the distance between itself and the British position.

Section III. DEFENSE AGAINST GROUND-ATTACK PLANES

1. GENERAL

The effective use of Allied ground-attack aircraft against German troops and armored vehicles, especially tanks, has led the Germans to place great emphasis on defensive measures.

In the Polish and French campaigns, German machine-gun and cannon fire from low-flying attack planes caused great damage to military equipment and many casualties to personnel. Similar tactics were effectively employed at the outset of the Russian invasion. However, the Soviets concluded that a heavy concentration of small-arms fire would not only damage or destroy the planes, but would also bolster the morale of the troops by keeping them in action. Accordingly, the Russians proceeded to stress this form of defense. The results were encouraging, inasmuch as many German planes were damaged or shot down by rifle fire concentrated on their vulnerable under parts. The Germans countered by increasing the armor on

their attack planes, which reduced personnel losses but did not entirely prevent structural damage.

In one instance in Africa, an eye-witness reported the destruction of three Italian planes in 5 minutes by small-arms fire. In another case, the Germans claim to have brought down a Soviet plane with an automatic pistol.

2. GERMAN INSTRUCTIONS

On their own account, the Germans have endeavored to impress their troops with the absolute necessity of employing all available fire power against ground-attack planes. The following instructions appear to have had wide distribution among the German troops in Africa:

"Low-level air attacks have once again led to serious losses. In spite of this, troops still fail to seize the opportunity of destroying the enemy machines. Frequently no sort of defense is put up, and the enemy's task is thereby rendered easier.

"It has been proved, however, that heavy losses both of personnel and planes can be inflicted by the use of infantry weapons. Airplanes are sensitive and are partly crippled by hits on the engine, gasoline tank, ammunition, and so forth. Considerable success is attained when a pilot is put off his aim or when a plane has become a semi-casualty.

"Enemy fighters have a habit of flying very low and climbing only just before attacking. For this reason they cannot be picked up by the Air Warning Service sufficiently early to allow our fighters to arrive in time. The fire of all available weapons, including rifles, is therefore the best means of defense in such cases."

The Germans devised the following methods to beat off low-level attacks:

"a. Concentrate the fire of all weapons not immediately engaged in ground defense.

"b. Open fire on the planes before they attack you; open with a burst and follow it up with rapid rifle fire.

"c. Meet the attacking plane with a hail of bullets.

"d. Don't fire on diving planes at a range greater than 2,000 feet, because it is useless and serves only to give away your position to the enemy.

"Every soldier—no matter to which arm of the service he belongs—must be determined to destroy the attacker from the skies.

"Not only is small-arms fire a strong deterrent to enemy pilots, but a few bullet holes in an airplane may keep it in the repair shop for many days."

(NOTE. The British, in their defense of Tobruk, proved that small-arms fire can be effective against low-flying aircraft. In one period, rifles and Lewis-type machine guns accounted for nearly half the bombers brought down. One captain rigged a twin Lewis gun outside his office and was officially credited with six planes shot down.

Another of Tobruk's small-arms defenders was "Tiny," a very husky naval gunner who came into the harbor aboard a small British warship. Fifteen Nazi dive bombers attacked the ship, and she settled down in the harbor with all guns blazing. Her shattered superstructure still remained above water and Tiny and his mates got permission to remain aboard to get their revenge. Whenever the bombers came over they scrambled to the poop and let the enemy have it with their machine gun.)

Section IV. PARACHUTE TROOPS

The German parachute troop organization is continually expanding. For nearly two years, however, there have been no major air-borne operations. Since the campaign in Crete, German parachute troops have chiefly been employed as infantry, and today they are encountered more and more often in this role. This should not be interpreted as meaning that the German paratrooper is now merely an infantryman who has received training in parachute operations. Actually, he is recruited and trained as a specialist. While infantry tactics are a basic part of the instruction, special emphasis is placed on training for surprise attacks directed toward securing and holding small vital areas until the arrival of reinforcements. Instruction in demolition work and guerrilla warfare is also included.

Originally, the Ju 52 transport was used both in training and in actual operations, but recent reports indicate that the He 111 bomber is being used for training purposes. Jumps from altitudes as low as 275 feet were made from the Ju 52; however, the higher speed of the bomber makes it hazardous to

jump from altitudes under 600 feet. This has necessitated a revision of landing tactics. When the members of a machine-gun unit jumped in quick succession from a Ju 52, they were able to land fairly close together, whereas the same men jumping from a bomber are likely to land about 250 feet apart—altogether too great a distance for a tactical unit.

The new jumping procedure is interesting. The aircraft fly in close vees of three, with the center plane slightly higher than the other two. A tactical group is distributed among the three planes: No. 1 man in the left-hand plane, No. 2 man in the center plane, and No. 3 man in the plane on the right. When these three men jump, they are separated only by the distances between the belly turrets of the bombers, and therefore are likely to land approximately 35 feet apart. This enables them to assemble and go into action much more quickly.

It should be noted that He 111's carrying paratroops may be accompanied by active bombers of the same type, and that carrier identification by ground defenses may therefore be difficult. The possibility of surprise is also increased.

A further innovation involves smoke. The escorting bombers may be expected, at times, to fly ahead and drop high explosive and smoke bombs, creating a wall of smoke into which the carriers fly and drop their troops.

In the early stages of paratroop operations, it was considered very difficult for a man to land safely if

he carried any weapons other than an automatic pistol and a large jackknife, although the men in the first platoon to land were equipped with one to four hand grenades, and every fourth man carried a light automatic carbine. Accordingly, rifles, ammunition, light field guns, and mortars were dropped in separate containers, and in loads up to 260 pounds. It is now reported that, in addition to their usual equipment, parachutists jump with light machine guns, machine carbines, or rifles, and that they have drum magazines strapped to their waists. The light machine gun is wrapped either in a blanket or in a special zippered case, and may be put into action immediately. (In some instances a belt of ammunition is adjusted in the machine-gun feeder before the jump.) The separate containers are still used, of course, for additional ammunition and the heavier types of equipment.

Ground-air communications have been improved. Upon landing, the signal section, which consists of two noncoms and five especially picked men, establishes radio communication with the German Air Force planes and guides them in, using a powerful transmitter. If there is a hitch in establishing radio contact, smoke signals are used more often than identification panels.

The Germans are now well aware that if parachute troops or other air-borne troops are to be employed successfully, well-coordinated air support is a necessity.

Section V. PANZER GRENADIERS

The Panzer Grenadier regiments, which are the assault ground troops of the German armored divisions, are notable for their speed, mobility, and great fire power, as well as for their methods of cooperating closely with the tank regiments.

Besides the varied light and heavy armament possessed by the Panzer Grenadier rifle companies, in the Panzer Grenadier regiments and battalions we find headquarters companies, heavy gun companies, tank-destroyer platoons, motorcycle dispatch rider platoons, signal platoons, and engineer platoons. In addition, supply echelons for munitions, fuel, and rations are responsible for the maintenance of the troops. Repair echelons insure that motor vehicles, guns, and equipment are ready for use at all times.

The extensive allotment of weapons to Panzer Grenadier units include rifles, pistols, machine pistols, light and heavy guns, and antitank guns of every caliber. This permits fire power of considerable scope—so much so that a Panzer Grenadier company can develop three times the fire power of the

normal German heavy infantry company. So-called "Panzer Grenadier personnel carriers," fully armored and designed for cross-country duty, carry the assault troops into battle (see fig. 2). In combat from these vehicles, and in combat on foot, the Panzer Grenadiers have become an arm which does not fight according to linear and frontal principles, like the infantry, but one which tries to force a decision within and to the rear of hostile positions.

The chief task of the Panzer Grenadiers is to put their mobility and strength to effective use in combined operations with tanks. Often the Panzer Grenadiers must precede the tanks in assault and attempt to create a favorable situation for a tank thrust. This is done, for example, in attacks across rivers, attacks against forces which are established on or behind terrain unsuitable for general tank action, attacks against prepared defensive positions, combat in and around villages and forests, and combat at night and in fog.

Although in independent combat assignments the Panzer Grenadiers are often allotted artillery, assault artillery, and antiaircraft, tank destroyer, and tank engineer units, the Grenadiers assume primary responsibility whenever fighting reaches the hand-to-hand stage. If the Grenadiers have been successful in establishing a bridgehead, breaking through a position, or clearing a village or a forest, they may be expected to get back into their carriers and pursue a disorganized opposition.

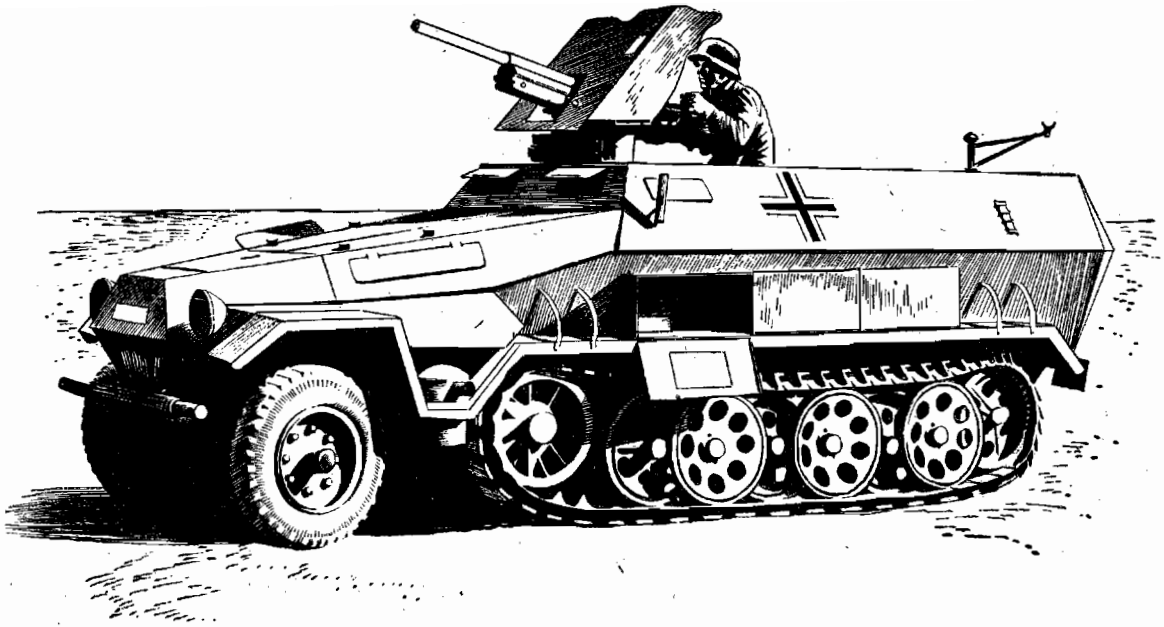


Figure 2.—Panzer Grenadier Personnel Carrier.

The Panzer Grenadiers, whose carriers are capable of a much higher speed than tanks can attain, have been known to dash far ahead of other troops—sometimes as much as 200 miles—to seize important communications centers, bridges, towns, or critical terrain. When they go deep into a hostile area, they maintain radio contact with their base and with supporting German aircraft. Such enterprises of course involve open flanks, "doubtful situations," and the danger of being surrounded by superior forces for an indefinite period, with no certain knowledge that supplies can be provided by air. From the leaders down, such undertakings demand a maximum of physical and mental preparedness, as well as a talent for assuming responsibility.

The German Army regards the Panzer Grenadiers as well qualified for certain defense tasks, too—especially the defense of broad sectors—because of their extensive allotment of light, medium, and heavy guns. If the Panzer Grenadiers have reached an objective well behind the opposition's front lines, they may be instructed to halt an advance made at considerable sacrifice (even though they might at this point be able to continue it) so that troop units which are not motorized can be given time to come forward.

Section VI. GERMAN ANTITANK AND TANK GUNS

1. ANTITANK GUNS

Since 1939 the German Army has been making a tremendous effort to bring into service a satisfactory antitank gun for every type of combat unit. Even the air-borne and parachute troops have been provided with light, tapered-bore weapons. A most important development is that the German Army is no longer dependent on the German Air Force for its heavy anti-aircraft-antitank gun, the 88-mm. Formerly, the Army had to borrow from the Air Force flak units armed with the 88-mm gun, because this was the only weapon which could give the requisite performance. The gun crews were German Air Force personnel, the equipment was not designed to Army specifications, and whether or not the guns were made available was likely to depend on the personalities of the commanders involved. Thus Rommel was able to get large numbers for use in a purely antitank role, chiefly because of his personal influence.

When the German Air Force releases flak units to the Army for use in an antitank role, the antiaircraft defense, which is primarily an Air Force responsibility, is bound to suffer. Hence it is only natural to expect that the Army's chief antitank weapons will increasingly be manufactured to its own specifications, and will be organized as an integral part of the Army.

In the 75-mm antitank gun, model 40, the German Army now has a piece which weighs 1½ tons as against the 7 tons of the 88-mm. For all practical purposes the two guns give the same performance against armor at distances up to 2,500 yards. Moreover, the 75-mm antitank gun, model 40, is to be manned by Army crews which have been Army-trained. In the 75-mm antitank gun, model 41, which also weighs about 1½ tons, the Germans have a weapon capable of defeating, under European fighting conditions (that is, up to about 1,500 yards), armor 100 millimeters thick—and greater thicknesses at shorter ranges.

When it was first brought out, the 75-mm antitank gun, model 40, had a muzzle velocity of only 2,400 to 2,500 feet per second, and it looked as though a still more powerful weapon would have to be produced. Now, with improvements, the gun has a muzzle velocity of about 2,800 feet per second, and the performance matches that of the 88-mm.

It should be evident, therefore, that Models 40 and 41 of the 75-mm antitank gun provide a powerful combination for all ranges up to 2,500 yards.[1]

2. TANK GUNS

Developments in the manufacture of German tank guns have, of course, been influenced greatly by the progress of the war itself. The 1939 German tank guns were not ideal for fighting the French tanks. At first, the 75-mm gun in the Pz. Kw. 4 was intended as a close-support gun, and as such it was very successful; even now it is being used for that purpose, and has recently been mounted in some Pz. Kw. 3's and in 8-wheeled armored cars. In 1941 the Pz. Kw. 3 was armed with a 50-mm weapon to fight British cruiser tanks, and the Germans decided to convert both the Pz. Kw. 3 and the Pz. Kw. 4 into fighting tanks in every sense of the term. (German tanks have always carried a generous allotment of high-explosive shells, just as German antitank guns have always been provided with high explosive shells.) As a result, in 1942 the Pz. Kw. 3 and Pz. Kw. 4 were rearmed with high-performance guns—the 50-mm Kw. K.[2], model 39, and the 75-mm Kw. K. model 40, respectively—and were given greatly improved armor.

[1] A very recent report indicates that the Germans have introduced a new towed 75-mm gun, which has a muzzle velocity of 3,250 feet per second and which uses the same ammunition as the 75-mm antitank gun model 40.

[2] Kampfwagen Kanone—tank gun.

Moreover, two new tank guns capable of giving an even superior performance were brought into service. These guns were the 75-mm Kw. K., model 41 (tapered bore), and the 88-mm Kw. K. 36.

The appearance of the 88-mm Kw. K. 36 was probably inspired by the demand of the Afrika Korps for a gun which could throw a heavy projectile and which could give a good penetration performance at ranges of from 2,000 to 2,500 yards. The 88-mm Kw. K. 36 is a very heavy gun and one which is awkward to mount in a tank. Its ammunition (33-lb round) is hard to stow and handle in a limited space. Although the 75-mm Kw. K. 41 is a lighter gun, and uses a shorter and lighter (16½ lb) round, it gives a much better armor-piercing performance than the 88-mm at any range below 1,500 yards. The 75-mm would seem to be better suited to Russian or European conditions than to desert terrain, and is likely to be seen more often in the future.

The performance of the 75-mm Kw. K. does not match that of the 88-mm at any range; however, since it is fundamentally a good weapon, the Germans may attempt to improve its performance, instead of trying to develop a new and heavier gun.

3. AMMUNITION

The Germans seem to be losing interest in a combination armor-piercing, high-explosive shell, now that

substantial thicknesses of armor have to be dealt with. During the past year they have been improving the anti-armor performance of armor-piercing projectiles: first, by reducing the high-explosive capacity of the heavier armor-piercing shells and, second, by continuing to develop high-velocity, armor-piercing shot with a tungsten carbide core. What this amounts to is that

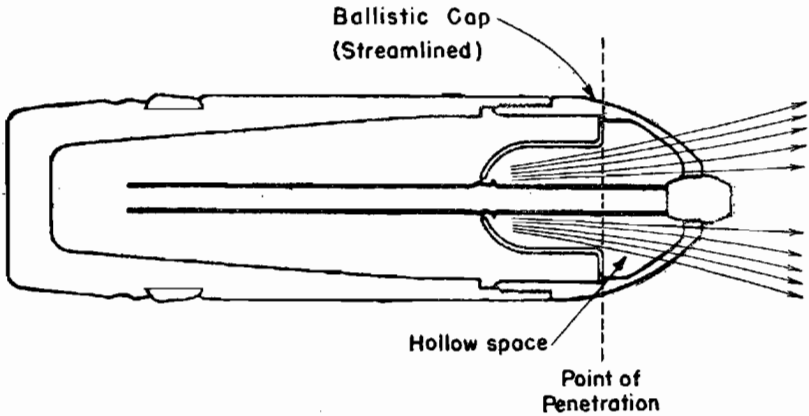


Figure 3.—Hollow-charge Principle.

the Germans are employing shot for attacks against thick armor, while retaining, for every weapon, high-explosive shells to be used in attacks against "thin-skinned" targets.

The Germans now use piercing caps on armor-piercing shells for everything over 20-mm caliber.

Both the 75-mm antitank gun model 40 and the Kw. K. 40 are provided with a hollow-charge round,[3] in addition to the high-explosive shell and the armor-piercing projectile with a ballistic (streamlined) cap. The Germans believe that the hollow-charge shell should not be used at ranges of more than 1,300 yards. It is interesting to note that there has been a rapid development of hollow-charge shells for all infantry, air-borne, and field artillery weapons. There is every reason to believe that the Germans will use these shells increasingly, and wherever possible.

[3] Hollow-charge projectiles have a hollow space (see fig. 3) in the nose section, to concentrate the blast against a small area and thus obtain better piercing effect. This principle is also followed in the manufacture of demolition charges and hand grenades.

Section VII. MISCELLANEOUS

1. 88-MM AA/AT GUN (DUG-IN)

The drawings in figure 4 are views of a dug-in but uncamouflaged German 88-mm dual-purpose gun in North Africa.

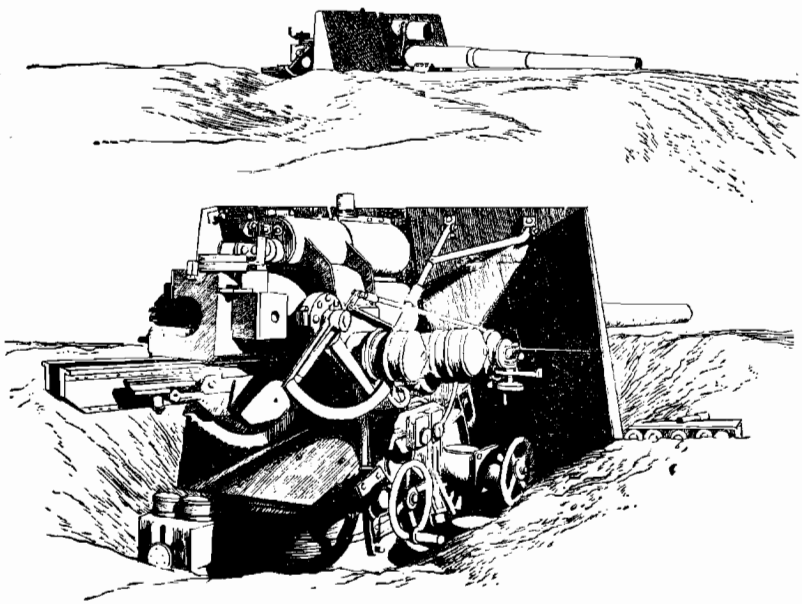


Figure 4.

2. NEW MACHINE GUN

The Germans are using a new type of machine gun, the MG 42 (see fig. 5). It has an unusually high rate of fire and is very likely to replace the MG 34 as the standard dual-purpose machine gun of the German Army.

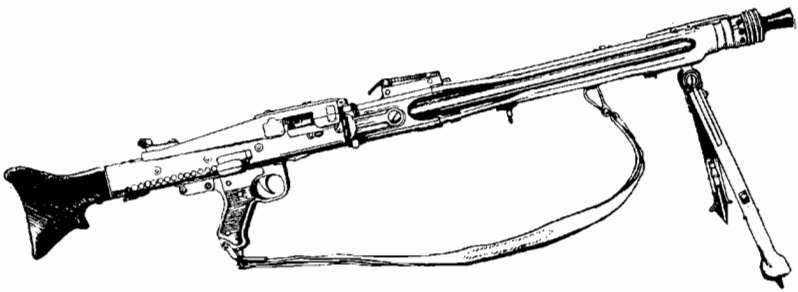


Figure 5.—German Machine Gun 42.

Weight with bipod	28¾ lbs
Over-all length	48 in
Length of barrel	21¾ in
Weight of barrel	3 lbs 14½ oz
Cyclic rate of fire	1,050 rpm
Mounting	bipod and tripod
Caliber	7.92 mm

Since stamping, riveting, and spot welding are used extensively in the manufacture of the MG 42, the new gun can be turned out much more rapidly than the MG 34. The barrel, barrel extension, and bolt head are virtually the only parts of the MG 42 which require intricate machine-tool work; as a result, the gun does not have the finished look which characterizes most German weapons.

The frequent barrel-changing made necessary by the high rate of fire is accomplished by a new and very good arrangement. A simple movement allows a hot barrel to be removed from the gun, and a fresh, cool barrel inserted with a reverse movement.

There is no provision for semi-automatic fire, as is the case with the MG 34.

The MG 42 is used as a light machine gun on a bipod, and as a heavy machine gun on a tripod. An antiaircraft rear sight is hinged on the leaf sight base, and a detachable antiaircraft forward ring sight can be fitted to a base on the barrel casing.

Both the MG 34 and the MG 42 use the same ammunition, ammunition belt, and drum or belt box, and are handled and stripped in the same general manner.

3. TANK RECOGNITION

In preparing revised recognition charts of our armored vehicles, the German Army relies heavily on the full cooperation of troops in the field. Through the usual channels, troops report:

a. New types of tanks, or altered models.

b. Organization and strength of our tank units.

c. Unusual tank tactics.

d. Types of tanks, shown in earlier German recognition charts, which have not been seen for some time.

Efficient German recognition of our tanks and other armored vehicles, and a thorough knowledge of the organization of our armored units, is the basis of all

German antitank methods. A German Army document points out that this information is used in evolving:

a. The principles for attacking heavy armored vehicles. In other words, the time to open fire, the time to stop the hostile tank, and the choice of ammunition vary according to the particular type.

b. An estimate of the enemy's intentions and, with this in mind, an appropriate use of our own antitank methods.

German troops learn to distinguish readily between the models and markings of German armored vehicles and those of the United Nations. Special attention is paid to different types of the same tank, and to captured tanks used by the German Army.

It may be said that measures which thwart successful German recognition are also likely to hinder German tactical decisions, especially those pertaining to antitank gunnery.

4. FLAME-THROWING TANK

The Germans have been known to adapt Pz. Kw. 2's for use as flame-throwing tanks. Details of the flame-throwing equipment mounted on these 12-ton tanks suggest that it is designed to fill an antipersonnel role at very close range.

Two independent flame throwers are mounted, one on each track guard. Each weapon traverses 180 degrees (presumably from front to rear), and is supplied with 35 gallons of fuel—enough for 80 flame

projections, each lasting from 2 to 3 seconds. Two high-pressure cylinders of nitrogen propel the oil to each flame thrower. Refueling the flame throwers takes from half an hour to an hour. For additional armament, each tank has a belt-fed machine gun fitted on a fixed mounting in the revolving turret, and carries 1,800 rounds of ammunition. There is an optical sight, adjusted to a range of 219 yards.

The tank has a 165-mile radius of action, and is capable of a speed of 34 miles per hour.

It is interesting to note that the flame-throwers' rate of fuel consumption (not more than 0.2 gal. per second) seriously limits the range of flame projection, which may be estimated at 30 yards (maximum).

A German manual on tank tactics observes that flame-throwing tanks should usually advance by bounds, halt, fire, and then repeat the procedure. The chief function of the weapon is to reach personnel among rocks, in cellars, in foxholes and dugouts, in wooded areas, and generally in places not accessible to tanks, or where gun fire is of little use.

PART THREE: UNITED NATIONS

Section I. SOME HEALTH RULES FOR N. AFRICA–MIDDLE EAST[1]

1. GENERAL

Military and civilian personnel in Northeastern Africa and the Western Asiatic countries may be exposed to serious health hazards, both because of the presence of diseases not commonly encountered in the United States and because of the relatively high incidence of certain other diseases that do occur on our continent. Some of the countries included in the area mentioned above have acceptable health departments, and a few of the larger cities have good health organizations. In normal times these health organizations may compare with certain cities in the United States. However, viewed as a whole, and considering the influence of the war, health conditions are much less satisfactory than in our country. Therefore, the soldier

[1] This section is based on information prepared by the Division of Medical Intelligence, Office of The Surgeon General, U. S. Army. It deals with only part of the health problems found in the Middle East area.

who values his health must be alert at all times to the possibility of illness and must guard against it by observing certain hygienic and sanitary precautions. A soldier's carelessness in this respect may result in his catching diseases, some of which may be serious; but attention to known health precautions should prevent all or most ailments for persons required to live in this part of the world.

These notes are designed to cover some of the potential hazards in a large general area, so that all the conditions enumerated may not apply to a particular locality. Common sense and good judgment, together with information acquired from local health authorities and Army medical officers, should serve to indicate which of the precautions outlined below can be modified or dispensed with to meet varying local conditions.

2. WATER

Drinking water contaminated with waste from the human body is one of the most common sources of infections of the intestinal tract, including the common diarrheas, typhoid fever, paratyphoid fevers, amoebic dysentery, bacillary dysentery, and, in some areas, cholera and schistosomiasis (infection with bloodworm or fluke). Guinea worm infection may also be acquired from water. Improper methods of disposing of human wastes, as well as inadequate treatment of water contaminated by these wastes, are direct causes of impure water.

Facilities for the purification of water are usually found only in the cities, and in the oil company settlements located at fields and at stations along the pipe lines. However, even in cities, the water frequently is not free from disease germs, either because of poor equipment, or because of a lack of supervision of available purification facilities, or both. In certain instances, safe water produced at the water plant is contaminated while passing through faulty water mains or when carried in unsanitary containers (tins, jars, animal skins, and so forth). In many cities, water distribution reaches only a limited area and thus supplies only a small percentage of the inhabitants, usually those in the European settlements.

The probability of outbreaks of various communicable diseases, especially water- and food-borne diseases, is greatly increased as a result of religious pilgrimages, from all parts of the Mohammedan world, to Mecca and other shrines.

While safe water may be found in some localities in Moslem countries of Northern Africa and Western Asia, it is generally advisable for army personnel stationed or traveling in this part of the world to consider all water unsafe for human consumption unless approved by a medical officer. The use of ice from such water presents the same problems as the water itself.

Carbonated drinks made from local water supplies should not be regarded as altogether safe. Soft drinks

(noncarbonated—for example, orangeade) are dangerous unless known to have been prepared under hygienic conditions and pasteurized.

Liquids recommended as safe for human consumption are:

a. Boiled water (boiled from 3 to 5 minutes).

b. Water properly treated with chlorine (see below; see also War Department Basic Field Manual 21–10, *Military Sanitation & First Aid,* par. 20c).

c. Tea
d. Coffee } when water is boiled in its preparation.

e. Beer and wines, when properly prepared and bottled.

f. Fruit juices, undiluted and freshly prepared—preferably by oneself.

Water treated under the supervision of British or U. S. Army Medical Department personnel is safe and should be used, where available, in preference to any other.

As a general rule of water chlorination, if the odor of chlorine is detectable after a contact period of 30 minutes, the water is safe, provided the odor does not come from concentrated chlorine that has been spilled on the hands or on the water container. It is therefore advisable for a person other than the one who treated the water (his hand may carry the odor) to perform the "odor test." If the water is muddy or contains large quantities of dirt and suspended matter, some form of filtration should be employed whenever

possible. The resistant form of the organism which causes amoebic dysentery may not be destroyed by chlorination alone, so that filtration before chlorination or boiling will be desirable.

Under field conditions where troops cannot obtain safe water, they can purify water in their canteens by the use of halazone tablets. Two tablets (4.0 MF or $\frac{1}{16}$ grains) are required for each canteen (one quart) of water. If the water is especially muddy, one or two additional tablets may be necessary. Where high-test calcium hypochlorite is used, the procedure is as follows:

The standard U. S. Army tube is broken, and the contents are dissolved in a canteen of water. One canteen-top full (approximately $1\frac{1}{2}$ teaspoons) may then be added to each full canteen of water which is to be treated. Regardless of the method used, the water should be allowed to stand for $\frac{1}{2}$ hour, and the "odor" or "taste" test should be applied. If one can detect the free odor of chlorine, or can taste chlorine when the water is applied to the tongue, a chlorine contest of at least 0.4 parts per million is indicated, and the water may be considered safe. One should be certain that the odor of chlorine does not come from concentrated chlorine spilled on the hands or the water container by careless handling. Where practicable, some form of filtration should be employed if the water is muddy or contains large amounts of organic material. This will aid also in eliminating the resistant form of the organism which causes amoebic dysentery.

3. WATER ECONOMY IN DESERT AREAS

Day temperatures may go as high as 130° F. in desert climates. This subjects the human body to severe stress, especially with regard to loss of water and salt. Exertion under these conditions is accompanied by much sweating. As a result, not only are large quantities of water lost, but also much body salt, which is in solution in the sweat. Under extreme conditions, as much as 10 quarts of water daily may be lost by sweating, although in hot, dry climates so much evaporation occurs that one is not conscious of this excess of perspiration. In fact, evaporation of sweat in high temperatures is the principal method by which the body is able to cool itself and thus maintain a normal temperature.

In temperate climates, except under conditions of strenuous physical exertion during warm weather, salt and water lost by sweating are replaced by a normal diet and moderate drinking of water; however, in the heat of the desert, more than ordinary quantities of salt and water must be consumed in order to maintain normal body requirements for these chemicals. Experience of desert armies indicates that an average of 5 to 6 quarts of water per man per day may be all that can be supplied for all personal purposes. Under extremes of temperature and physical exertion, up to 10 to 12 quarts are likely to be necessary. In emergencies, 2 to 3 quarts per day may suffice, but on such a restricted water ration, physical efficiency is reduced

after a short interval, probably 2 or 3 days. Therefore, under desert conditions where water supplies are inadequate, it is imperative to conserve water: before consumption, by care of water supplies, and after consumption, by avoiding unnecessary physical exertion and exposure to the sun, thus reducing sweating. Salt lost in perspiration should be replaced. (See subparagraph c below.)

Take the following precautions:

a. Stay in the shade as much as possible. Heavy work should be done at night, very early in the morning, or late in the afternoon. When work during the hot hours of the day is necessary, frequent periods of rest are advisable.

b. Drink water slowly and in small amounts (not more than an ordinary glassful at a time), but more frequently than in temperate climates.

c. Take two tablets of salt (equivalent to 20 grains, 1.3 grams, or ¼ teaspoonful) with every full canteen (1 quart) of water consumed. (See W. D. Circular 129, dated July 5, 1941, and Circular 169, dated Aug. 14, 1941.)

d. Avoid unnecessary physical exertion, and thereby prevent excessive sweating.

e. Wear headgear, preferably a sun helmet, when exposure to the sun is necessary for an appreciable length of time. Outer garments should be loose-fitting so that sweat will evaporate easily. Shorts are satisfactory during the day, especially indoors, but from

dusk until morning long trousers and long sleeves are imperative. The often-repeated suggestions to wear stomach bands, spinal pads, and similar devices to prevent diarrhea have no scientific basis and are harmful since they interfere with normal heat loss from the body.

f. The use of a superior grade of dark glasses is advisable under some conditions. The Calabar lenses, now widely used by Air Force personnel, are satisfactory.

g. Cool water evaporates slowly, and is more palatable and thirst-satisfying than warm water. Protect water supplies by keeping them in closed containers in the shade. Use insulated containers wherever possible.

h. Where conditions permit, such foods as canned tomatoes may be advantageous not only as rations, but also because they supply additional fluids.

i. Fluids are lost not only through sweating, but also through vomiting and diarrhea. Individuals suffering from these conditions, or from illnesses accompanied by fever, are susceptible to the effects of heat and should not be sent out from bases or camps until they have recovered completely.

4. FOODS

a. General

Foods are the second great source of intestinal diseases. They involve even greater hazards for the

uninitiated or unwary, since foods are not only subject to contamination, just as water is, but are also a fertile place for germs to grow. Refrigeration facilities for preventing or reducing bacterial growth (spoilage) in foods, especially meats and milk, are inadequate or lacking in many localities in this part of the world. In most instances, meat is not inspected, either before or after slaughter; as a result, meat from animals infected with tuberculosis, undulant fever, anthrax, trichinosis, and so forth, may be distributed for human consumption. Heat (cooking) is the only practical and effective agent for destroying bacteria in foods, but even well-cooked foods are subject to recontamination (by food handlers—cooks and waiters—or by flies, other insects, or small animals) and thus may become unsafe for consumption. Only well-cooked foods, freshly prepared, preferably consumed while hot, and not reheated, are safe for human consumption. Exceptions are bread and crackers, which may be considered safe unless mechanically contaminated.

Foods for lunches, as commonly prepared before short missions (flights, patrols, and so forth) in the United States, are likely to spoil in a short time under tropical or desert conditions. Therefore, it is recommended that sandwiches should not be made before departure, but that such foods as canned meats and other tinned goods, bread, crackers, thick-skinned fruits, and so forth, be carried. The Army canned field ration is a practical, safe food for the above uses.

If canned foods are used, they must be eaten soon after the can is opened.

b. Milk

Improperly handled dairy products (milk, cream, butter, cheese, etc.) constitute one of the most dangerous groups of foods. Disease-free dairy herds, pasteurization, and adequate refrigeration are not commonly encountered in Asia or Northern Africa. Raw milk not subjected to these safeguards may carry the following: dysentery, typhoid and paratyphoid fevers, common diarrheas, diphtheria, tuberculosis, undulant fever, septic sore throat, and other infectious diseases.

Only properly bottled pasteurized milk (meeting Medical Department standards), canned evaporated milk, condensed milk, powdered milk prepared with boiled water, or milk boiled immediately before use can be recommended. All other milk should be considered unsafe, as should ice cream prepared with local milk, and also cream for coffee and cereals.

c. Fruits and Vegetables

Soil pollution by human waste is common in this part of the world. When fertilized with this waste, the outer surface of vegetables grown by the native farmers are almost certain to be contaminated. Any of the intestinal diseases may be acquired by the consumption of uncooked vegetables. Therefore, only freshly cooked vegetables should be eaten. Such stand-

ard items of the American diet as salads made of lettuce, other uncooked leafy vegetables, or raw carrots and other root vegetables, cannot be eaten with safety. The dipping of vegetables in chemical solutions such as potassium permanganate does not protect against intestinal infections. Thick-skinned fruits requiring peeling—citrus fruits, papayas, mangoes, and melons, for example—are safe for human consumption provided they are not mixed with raw vegetables in salads. It is considered advisable to scald the skins of these fruits before peeling and eating.

5. CLOTHING

The prevalence of certain skin diseases, particularly "dhobie itch," necessitates frequent change of underclothing and socks. Light-weight clothing suitable for summer wear in the southern United States is satisfactory except in certain mountainous areas, and in Iraq and Iran where winter temperatures as low as 0° F. may be anticipated (January). Marked variations of temperature between day and night in the desert necessitate both warm and tropical types of clothing. Cases of pneumonia have been reported in increased numbers among aviators flying under desert conditions, and are thought to be caused, in part, by the drastic change from the high temperature of ground levels to the cold of high altitude (and vice versa), when

the aviator has no opportunity to change to clothing suitable for either one extreme or the other.

Care should be taken to put on a sweat shirt, jacket, or similar garment immediately after violent exertion. The wearing of headgear, preferably a sun helmet, is required when exposure to the sun is necessary. Shoes should be worn at all times as a precaution against hookworm disease. Because of the prevalence of certain eye diseases—for example, trachoma, gonorrheal ophthalmitis, and pink eye—it is necessary to avoid contact with personal articles, such as towels and pillowcases, used by other persons.

6. BATHING

Daily bathing is advisable when the water supply will permit. It is important to clean and dry thoroughly all skin folds of the body (crotch, groin, navel, armpits, around the scrotum, and between the toes) in order to prevent fungus infections such as "dhobie itch." The daily use of Army-issue foot powder on the parts of the body noted above is also a good preventive measure.

Fresh waters, such as lakes, rivers, streams, swamps, irrigation ditches, flooded rice fields, and so forth, in the area covered by this survey often harbor the young forms (larvae or cercariae) of various bloodworms or flukes. These flukes enter the body through the skin of swimmers, bathers, or persons wading in such

waters. The flukes may also be present in contaminated drinking water that has not been boiled or sufficiently treated with chlorine. They may cause serious diseases of the bladder and intestines. (These diseases are known as urinary bilharziasis or schistosomiasis and intestinal bilharziasis or schistosomiasis, respectively.) An early symptom of these diseases may be a skin rash. The urinary type is more common in this part of the world and in some areas affects from 20 to 40 percent of the native population. The cercariae are harbored by certain types of snails, and when discharged into the water cannot survive longer than 48 to 72 hours without a suitable host. Thus if water for bathing is impounded for such a time, and is free of snails, it becomes safe for bathing purposes, but not for drinking. Salt water bathing and swimming, except at beaches near the mouths of fresh-water streams or near city sewage outlets, present no disease hazard.

7. HOUSING

Clean and adequately screened quarters should be obtained if possible, and each individual should carry his own mosquito net. Shoes, clothes, luggage, and bureau drawers should be inspected carefully, since scorpions, spiders, and other insects prefer dark, warm places for rest, and may crawl into such places at night. Dwellings in the poor sections of the cities and in rural regions are dirty, and may harbor insects

and pests of many descriptions. Of these vermin, mosquitos, flies, fleas, lice, bedbugs, and ticks are most dangerous and obnoxious to man. Because of the presence of these insects, it is wise to refrain from sleeping in quarters of this kind.

Section II. PHYSICAL TRAINING NOTES FOR BRITISH AA UNITS

1. INTRODUCTION

The British Antiaircraft Command reports that a number of antiaircraft regiments have arrived at battle training centers without having had the proper physical conditioning. The regiments which have been trained and hardened physically go through the rigorous battle training with practically no injuries or sickness, while those lacking in physical conditioning have a high rate of injuries and sickness.

In emphasizing better physical conditioning of regiments before they reach battle training centers, the British Antiaircraft Command pointed out that this could not be accomplished with mere "daily dozen" exercises of the "bend-and-stretch-arms" type.

2. PHYSICAL EFFICIENCY

The following tests, laid down by the British War Office, are used by their Antiaircraft Command as a basis of judging the physical efficiency of antiaircraft

units (all tests should be carried out with full combat equipment):

a. Run 2 miles cross-country in 17 minutes.

b. Run 200 yards, and at the finish carry out a firing test in which three hits out of five rounds must be obtained on the figure 3 target (British) within 1 minute 15 seconds.

c. Complete a forced march of 10 miles in 2 hours, followed by a firing test.

d. Carry a man of approximately the same weight for a distance of 200 yards in 2 minutes, on level ground.

e. Jump a ditch 8 feet 6 inches across, landing on both feet.

f. Scale a 6-foot-high wall without assistance.

3. GENERAL PROCEDURE

To attain top physical efficiency, the British War Office has laid down the following general procedure:

a. Seek a general toning up of the body.

b. Strive to harden and strengthen the feet and ankles; practice them to withstand the strain of moving over rough or hilly terrain.

c. Train the lungs to coordinate efficiently when climbing or running.

d. Increase stamina by training the body to surmount natural obstacles skilfully, and to run, climb, pull, lift, carry, and crawl with the minimum use of energy.

e. Practice swimming with full equipment, and practice methods of crossing water obstacles at full speed.

f. Train the body to relax.

g. Train the body to react quickly and correctly to the unexpected.

4. SUGGESTIONS BY AA COMMAND

The British Antiaircraft Command makes the following recommendations with the object of assisting commanders of antiaircraft regiments in making such preparations as will enable them to get the maximum benefits from the battle training course:

a. Feet

The great majority of interruptions to training are caused from minor foot troubles, primarily blisters. The following precautions are therefore of first importance:

(1) A preliminary and thorough inspection by officers of the fit of shoes and of the condition of socks.

(2) Regular foot inspections by officers after marches, coupled with instruction in the care of feet.

(3) Training that hardens the feet (for example, route marches), to be carried on right up to the time of going to battle school, as even a short lapse of time will permit feet to soften again.

b. Route Marches

On arrival at the school, all men must be capable of making at least an 8-mile route march with full combat equipment.

c. Wearing of Equipment

As all training at the schools is carried out in full combat equipment, all ranks should get used to wearing equipment beforehand. This will involve wearing equipment as often as possible and for as long as possible during the weeks immediately prior to the course.

d. Jumping from Heights

Many cases of minor injuries to ankles and knees have been incurred by men when jumping over ditches, or down banks and over obstacles. On arrival at the school, all ranks should be capable of carrying out a running downward jump of 4 feet 6 inches in full equipment without sustaining injury.

Progressive instruction should be given in how to land when jumping from heights. It will be found that in the majority of cases elementary instruction will be necessary in plimsols (sneakers) from a low height.

The main point to be stressed is the necessity for landing on the ball of the foot and not with the weight back on the heels. Troops will gradually accustom themselves to shoes and battle equipment, and the height of the jump can be increased.

e. Forearms

Much of the training is carried out with the rifle at the port, and men have been inclined to suffer a good deal from lack of the necessary strength in the forearm. Every effort should be made to prepare for this with suitable exercises. Bayonet drill should figure prominently in the training programs.

f. At the Double

The majority of training is carried out at the double—much of it over rough ground. As much practice as possible should be given at this, and stress laid on economy of effort in order that all ranks will appreciate the necessity not only for reaching their objective, but for reaching it in a condition fit to fight.

g. Obstacles

The correct technique of clearing obstacles such as wire, walls, ditches, and streams should be taught as preliminary training

in negotiating the pursuit course. In this connection due regard must be given to the care of arms.

h. Endurance

All preliminary training should be progressive, but it must be hard. A man's powers of endurance and his will to see a job through will be fully tested only when he is on his last legs.

(Motor transport drivers and office personnel will need special attention in this preliminary training.)

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NOTICE

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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.

Readers are invited to comment on the use that they are making of the *Intelligence Bulletin* and to forward suggestions for future issues. Such correspondence may be addressed directly to the Dissemination Unit, Military Intelligence Service, War Department, Washington, D. C. Requests for additional copies should be forwarded through channels for approval.

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PART ONE: GERMANY

Section I. RECENT TRENDS IN THE USE OF MINES AND BOOBY TRAPS

1. INTRODUCTION

In earlier articles—"Minefields in Desert Terrain" (*Intelligence Bulletin* No. 5) and "Booby Traps" (*Intelligence Bulletin* No. 1)—this publication has discussed the Axis' use of mines in North Africa and the general subject of booby traps. However, when the Germans were increasingly forced to assume the defensive in the North African theater, they made certain variations in their methods of laying mines and preparing booby traps. The notes that follow deal with some recent trends observed in Tripolitania and Tunisia.

2. ANTITANK MINES

The Tellermine, model 35, is still the standard German antitank mine (see fig 1).[1] In addition, the

[1] Recently two other models have appeared. They will be discussed in the *Intelligence Bulletin* as soon as complete details are available.

Germans occasionally make use of captured mines and Italian mines. Recent reports indicate an increased use of wooden box mines containing TNT, captured British guncotton, or German prepared charges. These wooden mines are difficult to locate with mine detectors, especially when bakelite igniters are used.

Not only are antitank mines frequently booby-trapped (by the addition of pull igniters), but antitank and antipersonnel mines are often laid in the same area.

The Germans, often retreating in haste, have found that a tar-bound macadam road, especially one which has a rock foundation, cannot be mined quickly. This has led them to do a great deal of mine laying in road shoulders, chiefly using Tellermines and burying them deep at irregular intervals along a road. The enemy

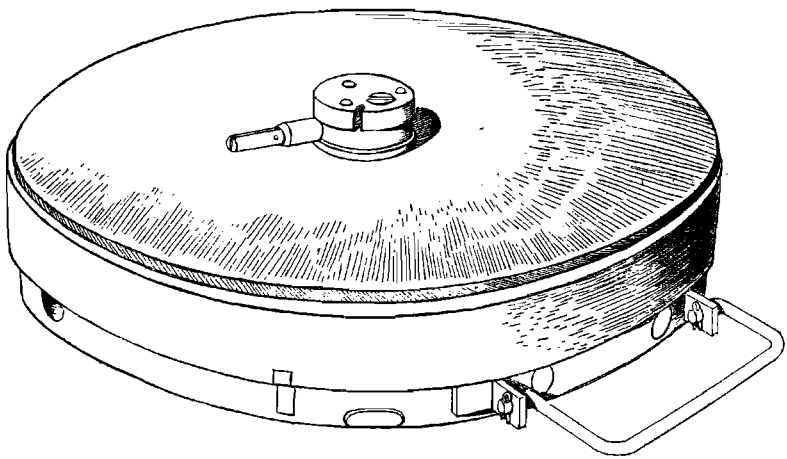

Figure 1.—Tellermine, Model 35 (standard German antitank mine).

carefully removes all evidence of excavated earth, and occasionally scatters small stones or fragments of wood or metal on the site as an aid to concealment. Axis troops usually collect all empty Tellermine crates, and throw them away farther along the line of retreat.[2] In some cases, once the existence of a mined area has been established, it is possible to locate the mines merely by inspection; even so, it has been found that the use of detectors over all such areas is the best procedure.

The Germans are especially likely to choose the following types of places when laying mines in road shoulders:

a. At crossroads and junctions, and sometimes on an "island" not surfaced with tar-bound macadam.

b. Near roadside houses or other obvious turn-outs, where vehicles are likely to pull off the road.

c. In defiles, where passing vehicles sometimes go over the edge of the macadam.

d. In entrances to detours.

e. At sharp corners, where traffic is always likely to go over on the shoulder.

In sandy stretches, where the sand might be expected to blow across the road, the Germans sometimes place mines on the road surface and cover them with sand strewn in such a manner that it appears wind-blown.

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[2] A recent German order states that for the purpose of economizing on steel, the present field packing for Tellermines, model 35, will be replaced immediately by wooden containers.

On hard-beaten tracks, holes are bored with earth augers. This makes the mines much harder to locate visually.

When time and the condition of a road or trail permit, the Germans often mine it according to a definite pattern. A variety of types may be encountered. For example, the Germans recently arranged 155 Teller-mines across a road in staggered blocks of 20 and, in addition, laid a very dense belt of mines, with only 1 yard between mines, in a straight line across the road. If a trail leads through scrub, loose pieces of scrub are often placed on top of mines as camouflage, and the mines themselves sometimes laid close to well-worn ruts, as well as across the trail. In these instances the mines are likely to be detonated only after a number of vehicles have passed by.

The anti-vehicle mining of railroad crossings is common. Eight mines in a V pattern, 8 to 12 mines in a Z pattern, and 24 mines in a block are among the various arrangements which have been reported.

In villages mines are likely to be laid in open spaces, such as squares and courtyards, which might conceivably be used as parking areas.

No major changes in the German technique of laying patterned minefields in open country have been reported; however, it must be remembered that German minefield patterns are flexible and may be encountered in many combinations and variations, especially when

the enemy has had time to prepare other than hasty defenses.

NOTE.—It is reported that the method of pulling out Tellermines by means of 100 yards of signal cable is a valuable way to save time and reduce casualties.

3. BOOBY TRAPPING OF TELLERMINES

The German Tellermine contains two recesses, one in the side and one in the bottom, to receive standard German detonators. Axis troops usually booby-trap Tellermines by driving pegs into the ground, either below the mine or to one side of it, and connecting them with thin wire to pull-igniter devices screwed into the recesses. In some cases trip wires are erected; these are usually attached to small stakes about 6 inches high. Pressure devices are also employed.

In general, it may be said that whenever enough time is available the Germans fit a high percentage of their mines with antilifting devices.

The following instances of booby-trapped Tellermines have been reported recently:

a. Apparently unarmed Tellermines lying exposed, with the pin in and the arming wire still wrapped around the igniter, but with an antilifting device underneath.

b. One Tellermine directly on top of another, with the two connected by a pull-igniter and the bottom mine inverted so as to make disarming more difficult.

Also, Tellermines have been connected with British mines placed above and beside them.

c. Five barrels, filled with earth, blocking a road; one or two of the barrels containing Tellermines with pull-igniters pegged to the road, so that the mines exploded when the barrel was moved.

d. Barrels similarly arranged, packed with large charges—such as shells—and placed on a culvert so that when the barrels were moved, the explosion blew in the top of the culvert.

e. A truck partly obstructing a road, with a wire leading from an axle to a pull-igniter in the side recess of a Tellermine. This mine is laid on top of another, and connected to it by a pull-igniter. The second mine, in turn, has a pull-igniter underneath it, which is plugged into the ground by means of wire.

f. Tellermines buried under fecal matter sprinkled with dust.

g. Cord or trip wire connecting a pull-igniter in the side of a Tellermine with a nail or peg in the door of a building or derelict aircraft.

h. Wooden box mines connected to pull-igniters in Tellermines, which are buried underneath the box mines.

NOTE.—It has been discovered that a Tellermine should not be laid again until the main igniter has been tested—away from the mine—to make sure that the shear pin is neither broken nor distorted. Safety pins should be pulled out from a safe distance.

4. ANTIPERSONNEL MINES

The antipersonnel mines now most commonly used by the Germans are the German "S" mine and the Italian B4, both shrapnel types. The "S" mines are usually fitted with the standard three-pronged igniter buried flush with the surface or else protruding slightly. In soft earth and sand, the igniter is sometimes 1 or 2 inches below the surface. "S" mines, often called "jumping mines," may be fired either by pressure or by trip-wire friction, and are thrown about 5 feet above the ground before detonating. The bursting charge of TNT scatters some 350 steel balls (sometimes diamond-shaped pieces of steel are used, instead) with such force that they are dangerous at 200 yards. B4 mines, which can be concealed but not buried, are fired by trip-wire friction only. The primary purpose of the antipersonnel mine, when used in minefields and wire obstacles, is to give warning of an approaching enemy. When laid elsewhere, antipersonnel mines are intended to cause random casualties and to lower morale. Both pull- and pressure-type firing devices are used by the Germans.

Recently the Germans have also been using a new and ingenious type of improvised box mine. Standard charges are prepared in small wooden boxes. The charge is fitted with a pressure-type igniter, which protrudes just enough to keep the lid of the box open about ¾ inch. If the lid is stepped on, the box explodes.

Sometimes a wire is attached to the bottom of the lid, and is passed down through the charge and through a hole in the bottom of the box. This wire is then attached to a pull-igniter screwed into a prepared charge so that anyone opening the box fires the charge. In other cases the wire is attached to the bottom of the box so that the charge is fired when the box is lifted (see fig. 2).

The Germans know that clever, imaginative siting of antipersonnel mines is all-important. For example, a recent instance of shrewd antipersonnel mining was the burying of "S" mines around a kilometer post (like a mile post) on which the figures were so obscure that it was necessary to walk up close to the post to read them. Again, it is reported that the enemy has been known to lay "S" mines under patches of spilled tar near his dumps. A patch of tar, when fairly dry, is lifted up, and a hole large enough to accommodate an "S" mine is dug underneath it. The mine is buried, and the patch of tar is put back over it—providing very effective camouflage.

Taking advantage of road craters and destroyed culverts, the Germans often lay "S" mines very liberally in the spoil on the lips of the craters, and then lay Tellermines and additional "S" mines up to a radius of 50 yards on either side of the road, in the path of likely diversions.

The Germans always lay "S" mines and other antipersonnel types in front of localities they intend to defend—especially in strategic hillsides and defiles.

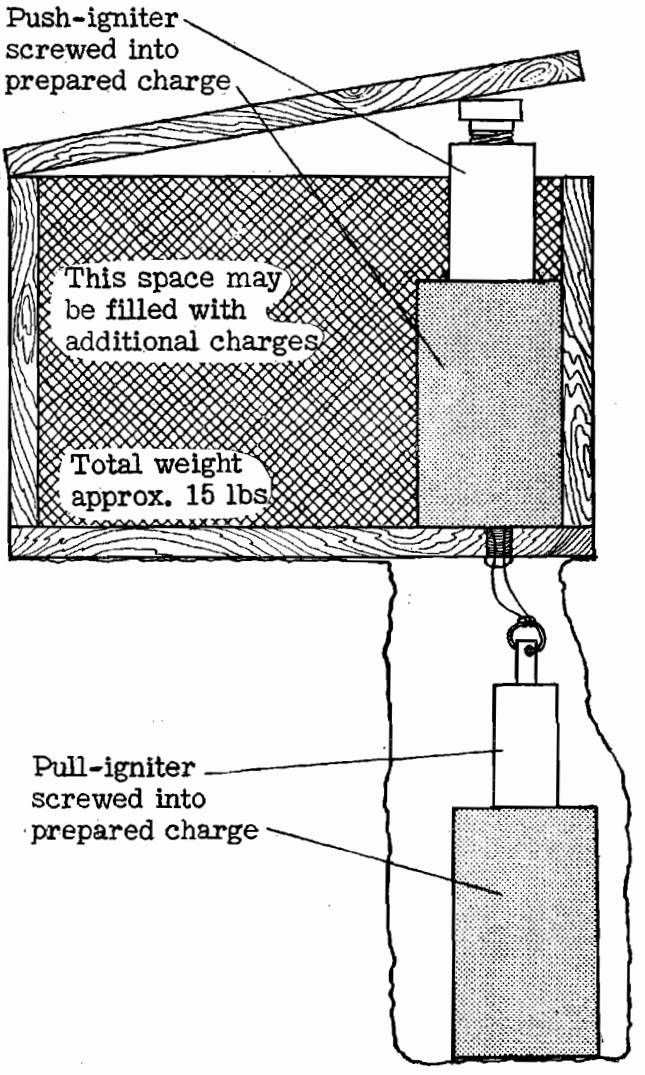

Figure 2.—New Type of Improved Wooden Box Mine.

5. BOOBY TRAPS (PREPARED CHARGES)

Although all mines fitted with pull-igniters and trip wires are sometimes lumped together under the general name of "booby traps," the expression in its exact sense refers to explosive charges or mines ignited by standard pressure-, pull-, release-, or combination-firing devices or by improvised means such as electrical connections. The igniter may be attached by fine binding wire to trip wires, marking stakes, low bushes, or loose bits of scrub used to camouflage mines. To date the Germans have booby-trapped almost every conceivable type of movable object—especially doors, windows, steps, floors, pictures, furniture (especially the drawers), cupboards, water taps, telephones, light switches, rugs, mats, documents, flashlights, cigarette cases, fountain pens, and even the bodies of their own dead. In fact, the list has included virtually everything that the perverted imagination of the enemy could encompass. Often the booby trap serves no tactical object whatever. The best precaution is to remember that everything movable in an area formerly occupied by the enemy must be treated with the greatest suspicion.

The following are recent notes by military observers on the subject of German booby traps:

a. Anything in the least out of the ordinary may indicate the presence of a booby trap—for example, German notice boards facing us instead of the enemy, loose strands of wire, stones with wire wrapped around

them, and so on. This observation, however, only supplements the basic rule regarding booby traps—*everything movable and seemingly harmless must be suspected and treated with caution.*

b. Stakes with booby traps under them are generally dug in, while others are knocked in.

c. Notice boards with skull and crossbones painted on them indicate the presence of booby traps in the immediate area.

d. Small heaps of stones, sometimes piled so as to support the base of a picket, are likely to be wired to prepared charges. This is also true of discarded gasoline, oil, and water cans and drums.

e. Obstacles on roads, tracks, and trails are almost invariably booby-trapped.

f. The standard German antipersonnel grenade is now booby-trapped.

(1) The German Army's small egg-shaped antipersonnel grenade can be identified by its gray body and blue primer cap. A 5-second delay fuze is fired when the blue cap is unscrewed and the enclosed string pulled.

(2) The same grenade with a red primer cap, instead of the blue, is a booby trap. When the red primer cap is removed and the enclosed string pulled, an instantaneous fuze is fired, killing the operator.

g. The Germans are likely to lay a new type of booby trap on landing strips or in any clearing that we may be expected to enlarge. On at least one occasion the Germans buried two "S" mines under a low

bush, and apparently connected a well-concealed trip wire to a lower branch of the bush. When the bush was dug up in the course of clearing operations, the "S" mines were detonated.

h. The Germans have been known to booby-trap an improvised device for cutting the tires of planes attempting to use an airfield. Using a type of wooden container manufactured to hold three "S" mines, they cut the metal rim-bands with a hacksaw and bend them upward to form spikes. The container is then sunk in the ground, with only the spikes protruding. A prepared charge with a pull-igniter is attached to the container, so that anyone who lifts it detonates the charge. "S" mines may also be buried close to the box.

6. TACTICAL USE OF MINES AND BOOBY TRAPS

The Germans use antitank and antipersonnel mines as obstacles to reduce the mobility of enemy vehicles. Where possible, they are used in conjunction with natural or other artificial obstacles. Below are listed some of the most common tactical uses of mines.

a. To Strengthen the Defenses of a Strong Point

An order of German General Von Ravenstein, dealing with defensive measures in Libya, stated that mines should be used to cover small gaps within strong points. Where used for this purpose the mines are generally laid in narrow bands of a few

rows, and the antipersonnel mines are used in conjunction with barbed wire and tank ditch defenses.

b. To Cover Gaps between Strong Points

Von Ravenstein's order stated that the second use of mines is to cover areas between strong points. To accomplish this, the mines may be laid in extensive fields in order to cover large gaps with the intent to restrict enemy tanks to paths which enemy forces have previously prepared and in which they will be subjected to the maximum fire of defending guns.

c. To Form a Continuous Band of Obstacles

When a front becomes stabilized, both forces lay extensive minefields. In May 1942, the British laid a mined zone extending from Gazala to Bir Hacheim, some 50 miles, and doubling back in a V shape for another 25 miles. Such deeply mined areas do not consist of continuous fields of mines. Rather, they consist of successive bands of minefields laid in conjunction with defensive positions.

d. To Block Roads and Defiles

Such obstacles are of major importance to any army in retreat. Problems of supply require both retreating and pursuing armies to remain on the probably few good roads. The liberal use of mines laid in dense and irregular patterns, where every effort is made to render difficult their detection and removal, contributes materially to the successful withdrawal of a retreating force.

Section II. ARTILLERY TACTICS

1. IN NORTH AFRICA

a. Introduction

The following notes deal with German employment of artillery in North Africa. It is believed that they give general indications of the enemy's current artillery tactics.

b. Gun Positions

Ground conditions were apparently the deciding factor as to whether or not guns should be dug in. In principle, it would seem that guns always were dug in, except under the following circumstances:

(1) When the ground was so rocky and hard that it was considered more expedient to construct a breastwork of rocks and earth around a natural hollow than to dig in. Sometimes these positions were sandbagged.

(2) When it was foreseen that a position could be held only for a short time. In such instances, neither pits, breastworks, nor alternate positions were constructed.

When guns were staggered, the arrangement was like the letter "W," minus one stroke, and the guns were from 30 to 50 yards apart.

c. Alternate Positions

Although, under all normal circumstances, it seems to have been a rule to dig alternate positions, it has been reported that at least one battalion did not dig alternate positions because its guns were subjected principally to high-level bombing attacks—against which a change of position would not have offered increased protection.

Alternate positions were not used for night firing.

In certain instances, positions were camouflaged with garnished nets, tarpaulin, and even tentage. Evidence reveals that when camouflage was not attended to, it was always a case of laziness on someone's part. The implication is that instructions to camouflage guns had invariably been given.

d. Observation

At times observation was carried out in the following manner. There were two observation posts. One was 5,000 yards in front of the battery position, and was manned by an officer, a telephone operator, a radio operator with a walkie-talkie, and an antiaircraft gunner. The second observation post was from 2,000 to 3,000 yards forward of the first one. There was no direct intercommunication between the observation posts of

three batteries, but all targets had to be approved by each of the observation posts reporting. Communication by telephone and radio was always maintained between the observation posts and the command post. It is believed that there may also have been an additional radio link between the command post and division headquarters.

e. Counterbattery Fire

As a result of a shortage of ammunition, there was a decrease in the use of medium howitzers for counterbattery fire. However, 105-mm guns were reported as having stayed in action constantly to undertake counterbattery tasks, even when ammunition was short.

The practice of firing on British 6-pounder (57-mm) antitank guns was abandoned after it had been observed that British artillerymen were in the habit of occupying a position, firing, and then promptly moving to a different position.

It is reported that the Germans consider it necessary to expend from 100 to 200 rounds in order to destroy a battery of guns by artillery fire.

f. Training as Infantry

A certain German regiment apparently received intensive infantry training so that its personnel would be able to act as escorts for guns when necessary. (Our artillerymen of course receive this type of training, too.)

2. DEFENSIVE BARRAGES

The following extract from a German Army document on defensive barrages is also of interest. It is undoubtedly based on considerable battle-front experience.

As a rule, a battery should not be assigned more than one or two emergency barrage areas in addition to its normal barrage area.

The width allotted to each battery is 100 yards (150, if necessary) for 105-mm guns, and 150 yards for 150-mm howitzers. The barrage is fired in short bursts with the highest possible charge, and with the delayed-action fuze. The first concentration is fired automatically, or after a visual signal has been given. Such a concentration consists of 12 rounds fired in 2 minutes by the 105-mm pieces, and 8 rounds in 2 minutes by the 150-mm pieces. In case observation should prove impossible, or communications be destroyed, orders should always specify whether a new concentration is to follow a repetition of the signal. Apart from this precaution, the repetition of fire can vary according to circumstances.

The firing data for a barrage will be calculated and, whenever possible, verified with one gun. The corrections observed are then passed on to the other guns. The latest corrections can also be passed on to other batteries having the same equipment, provided that the difference between the line of fire and the direction of the wind is the same for the other batteries.

The area within which 50 percent of the rounds will fall must have been ascertained previously (and allowance made for an increase when the firing takes place on a downward slope). It is of course important to place the barrage in front of the forward line and in front of friendly wire, mine, or antitank defenses—generally by as much as 200 to 300 yards.

The shorter rounds must not be dropped nearer than 100 yards to the infantry in the case of the 105-mm's, and 200 yards in the case of the 150-mm's. Closer firing is to be undertaken only after agreement with the infantry. For this type of firing, calibers under 100 millimeters are the most suitable.

The results of the preparations made in the light of the latest corrections must be recorded separately. Each detachment commander will be handed a data sheet giving the orders for each different barrage. These are to be written up on a special board on each gun, or on the shield.

As soon as a metro message is received, the necessary calculations will be made and the barrage tables corrected accordingly.

During inactive periods the guns will be loaded (with projectiles only) and laid on the normal barrage. The number of rounds for the barrage will be held in readiness.

Section III. NEW GERMAN HEAVY TANK

In Tunisia the German Army sent into combat, apparently for the first time, its new heavy tank, the Pz. Kw. 6, which it calls the "Tiger" (see fig. 3). The new tank's most notable features are its 88-mm gun, 4-inch frontal armor, great weight, and lack of spaced armor. Although the Pz. Kw. 6 has probably been adopted as a standard German tank, future modifications may be expected.

The "Tiger" tank, which is larger and more powerful than the Pz. Kw. 4,[1] is about 20 feet long, 12 feet wide, and 9½ feet high. The barrel of the 88-mm gun overhangs the nose by almost 7 feet. The tank weighs 56 tons in action (or, with certain alterations, as much as 62 tons), and is reported to have a maximum speed of about 20 miles per hour. It normally has a crew of five.

The armament of the Pz. Kw. 6 consists of the 88-mm tank gun (Kw. K. 36), which fires fixed ammunition similar to, or identical with, ammunition for the usual 88-mm antiaircraft-antitank gun; a 7.92-

[1] To date there is no record of a Pz. Kw. 5 having been used in combat.

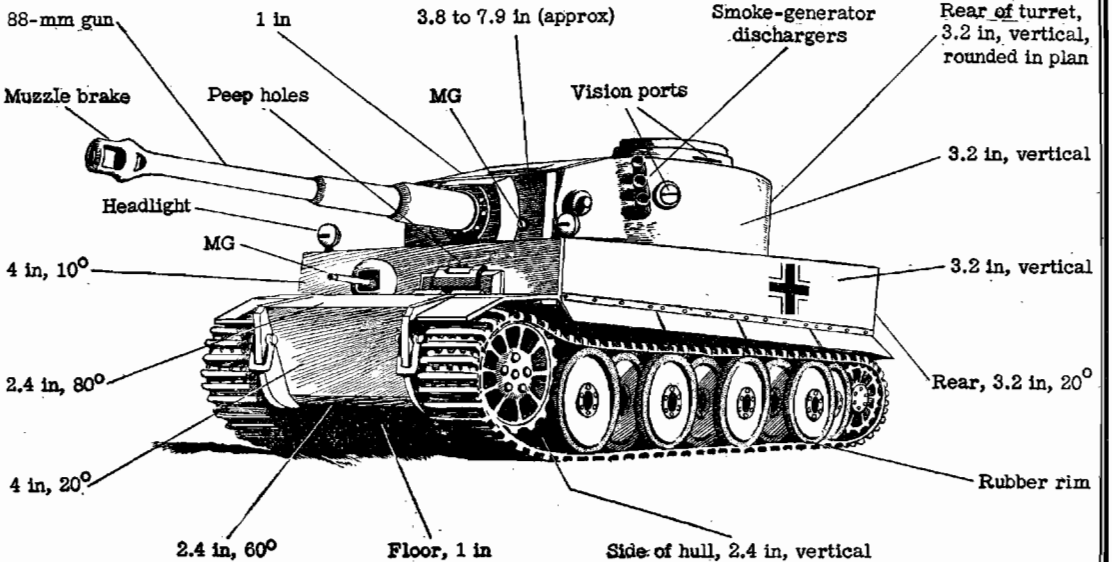
88-mm gun
1 in
3.8 to 7.9 in (approx)
Smoke-generator dischargers
Rear of turret, 3.2 in, vertical, rounded in plan
Muzzle brake
Peep holes
MG
Vision ports
3.2 in, vertical
Headlight
MG
4 in, 10°
3.2 in, vertical
2.4 in, 80°
Rear, 3.2 in, 20°
4 in, 20°
Rubber rim
2.4 in, 60°
Floor, 1 in
Side of hull, 2.4 in, vertical
HEAVY TANK — — PzKw 6

Figure 3.

mm machine gun (MG 34) which is mounted coaxially on the left side of the 88-mm; and a second 7.92-mm machine gun (MG 34) which is hull-mounted and fires forward. In addition, a set of three smoke-generator dischargers is carried on each side of the turret.

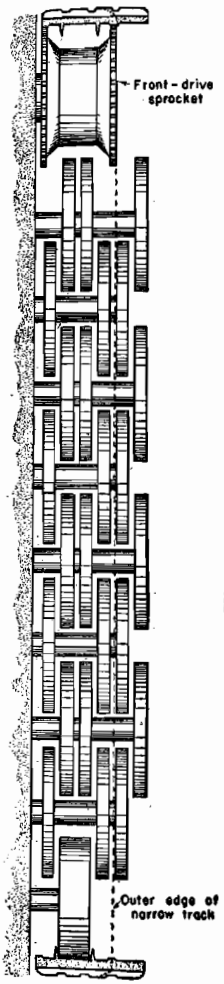

Figure 4.—Suspension System of the Pz. Kw. 6.

The turret rotates through 360 degrees, and the mounting for the gun and coaxial machine gun appears to be of the customary German type.

The suspension system, which is unusually interesting, is illustrated in figure 4. The track is made of metal. To the far right in figure 4 is the front-drive sprocket and to the far left the rear idler. There are no return rollers, since the track rides on top of the Christie-type wheels, which are rubber rimmed. It will be noted that there are eight axles, each with three wheels to a side, or each with one single and one double wheel to a side. There are thus 24 wheels—8 single wheels and 8 double wheels on each side of the tank. The system of overlapping is similar to the suspension system used on German half-tracks.

The tank is provided with two tracks, a wide one (2 feet, 4.5 inches) and a narrow one (just under 2 feet). The wide track is the one used in battle, the narrow being for administrative marches and where maneuverability and economy of operation take precedence over ground pressure. The dotted line in figure 4 indicates the outer edge of the narrow track. When the narrow track is used, the eight wheels outside the dotted line can be removed.

The armor plating of the Pz. Kw. 6 has the following thicknesses and angles:

Lower nose plate	62 mm (2.4 in), 60° inwards.
Upper nose plate	102 mm (4 in), 20° inwards.
Front plate	62 mm (2.4 in), 80° outwards.
Driver plate	102 mm (4 in), 10° outwards.
Turret front and mantlet	Possibly as much as 200 mm (8 in), rounded.
Turret sides and rear	82 mm (3.2 in), vertical.
Lower sides (behind bogies)	62 mm (2.4 in), vertical.
Upper sides	82 mm (3.2 in), vertical.
Rear	82 mm (3.2 in), 20° inwards.
Floor	26 mm (1 in).
Top	26 mm (1 in).

The angular (as opposed to rounded) arrangement of most of the armor is a bad design feature; reliance seems to be placed on the quality and thickness of the armor, with no effort having been made to present difficult angles of impact. In addition, none of the armor is face-hardened. The familiar German practice of increasing a tank's frontal armor at the expense of the

side armor is also apparent in the case of the Pz. Kw. 6.

Undoubtedly the Germans developed the "Tiger" tank to meet the need for a fully armored vehicle equipped with a heavy weapon capable of dealing with a variety of targets, including hostile tanks. Although the "Tiger" can perform these duties, its weight and size make it a logistical headache. It is entirely probable that the Germans, realizing this disadvantage, are continuing to develop tanks in the 30-ton class. Further, it is interesting to note that the Pz. Kw. 6 has proved vulnerable to the British 6-pounder (57-mm) antitank gun when fired at a range of about 500 yards.

Section IV. AIR FORCE

1. RECENT GROUND-ATTACK TACTICS

Recent reports indicate that German Air Force units in North Africa have developed new tactics, involving the use of Focke-Wulf 190's and Messerschmitt 109's (single-engine fighters) as dive bombers in raids on ports, airdromes, roads, and gun emplacements.

a. Attacks on Ports

(1) *By Day.*—Four types of daytime attacks on ports have been noted.

In the first type, FW 190's escorted by ME 109's make a weaving approach at about 20,000 feet and, when near the objective, glide down to between 10,000 and 12,000 feet. The 109's then veer off to attract the antiaircraft defenses, while the 190's maneuver into attack position and make a steep dive from the sun. They always dive in line astern.[1] The angle of dive is from 30 to 50 degrees, and the usual diving speed exceeds 400 miles per hour. At the end of the

[1] "In line astern"—one following another.

dive, the 190's are likely to bank to the right. After pulling out, they usually head straight for home, although sometimes they rejoin the 109's and both attack the target with machine guns. Occasionally the escort may dive with the bombing aircraft.

In the second type of attack, ME 109's approach at about 12,000 feet, make a shallow dive at full speed to 6,000 feet, and release their bombs at this altitude.

In the third type, FW 190's circle at 12,000 feet, and then peel off in a steep dive to about 6,000 feet; at this altitude the bombs are dropped.

The fourth type of attack involves Junkers 87's (the standard German dive bomber), which usually dive in formation, in line abreast, at a 60-degree angle from approximately 4,000 feet to drop their bombs at about 1,000 feet. Also, Ju 87's often approach at 10,000 feet, make a shallow dive to between 5,000 and 6,000 feet, and then release the bombs. They are immediately followed by FW 190's, which come over at 5,000 feet and dive steeply to 500 feet, disregarding antiaircraft fire. At 500 feet they release their bombs and then make an almost vertical pull-out.

(2) *At Night.*—Several variations in night attacks on ports have been reported. In one type the aircraft, perhaps Ju 88's, approach singly at about 10,000 feet, make landfall [2] to the flank of the objective, and circle inland. The aircraft then head toward the

[2] "To make landfall"—to cross a coastline.

sea, usually shutting off their engines and gliding down to 2,000 or 3,000 feet to bomb port installations. However, they sometimes make a steep power-dive from 6,000 feet to about 2,000 feet. After attacking port installations, the Germans always head out over the sea.

Ju 88's also make a high, level approach, and drop flares before they separate to make diving attacks from different directions. They may even approach evasively—abruptly changing direction a number of times—at altitudes of 8,000 to 12,000 feet, from which they dive to 2,000 feet in order to bomb.

b. Attacks on Airdromes

It is reported that the Germans have used a variety of methods in attacking airdromes. For example, fighters escorting FW 190's and Ju 87's often try to engage the opposition's fighter patrols at high altitudes while the Ju 87's execute a deep dive, pulling out at 7,000 feet. The 190's go in simultaneously with the 87's in a shallow dive, the leading plane diving at a slightly steeper angle and about 1,000 feet below. The bombing by the FW 190's has been more accurate than that by the Ju 87's.

Another maneuver carried out by FW 190's and ME 109's is a low-level approach from the sun, at an altitude of about 50 feet, to attack with cannon and machine guns. These aircraft also engage in mock dogfights

over the airdrome, breaking off suddenly and diving to attack.

At altitudes of from 10,000 to 15,000 feet, 190's may approach and then divide into two sections, one of which dives to about 2,000 feet to bomb the target while the other maintains altitude. After the dive, the sections rejoin each other, and both immediately dive at right angles to the original line of dive, in order to bomb and machine gun for added effect.

Still another method of attack is for fighter-bombers to come in at about 2,000 or 3,000 feet, followed by fighters several thousand yards behind. The fighters fly at an altitude of about 30 feet in order to strafe airdrome personnel, who are so preoccupied with the bombers that they often are taken completely by surprise.

FW 190's and ME 109's frequently circle at 8,000 to 10,000 feet, diving singly or in formation to attack a target with cannon and machine-gun fire. In another type of airdrome attack, Ju 87's approach in formation at 8,000 feet, escorted by a high cover of ME 109's and FW 190's. The 87's dive and release their bombs at 2,000 feet while the fighter-bombers drop one large or two small bombs from 10,000 feet. Again, ME 109's and FW 190's may appear over an airdrome in formation at about 6,000 feet, and then suddenly break off and attack from all directions with bombs and machine-gun fire.

c. Attacks on Roads and Gun Emplacements

In order of priority, the favorite targets on roads appear to be water trucks, staff cars, artillery movers, and ambulances. Road attacks vary in method. First, FW 190's or ME 109's, in threes or fours, usually reconnoiter the targets from about 6,000 or 7,000 feet. When they have sighted the desired objectives, planes dive to 50 feet, and fly either parallel to a road or diagonally across it, often attacking while vehicles are on an "S" curve or in a wooded stretch. Sometimes the planes fly far down a road, strafing any target that they encounter.

Another method of attack that the Germans follow involves coming in low over a hill and diving on a road in the adjoining valley.

Both dive and fighter bombers have been used in a counterbattery role to attack forward gun emplacements from 5,000 feet or less, depending on the intensity of the antiaircraft fire encountered.

2. INTERROGATION OF PRISONERS

German interrogation of United Nations prisoners who belong to air force units is in many ways comparable to the interrogation of ground force personnel, according to statements made by captured Germans. However, it is believed that attention should be called to certain reported German methods of interrogating air force prisoners, so that the members of all arms may be better informed regarding the enemy's technique of securing information.

It is reported, for example, that when an air prisoner of war is taken to an interrogation center, he is likely to be placed first in a single room outside the main camp until his first interrogation, after which a decision is reached as to the type of treatment that he is to be given.

After the prisoner has refused to give more than his name, rank, and number, he is likely to be moved into a room with a companion, in the hope that he will divulge information which can be picked up by hidden microphones. Often the companion is a stool pigeon, who plays the role of a comrade in distress and who pretends to be hurt if the prisoner does not talk freely.

Captured Germans report that stool pigeons sometimes are air prisoners of war belonging to German-occupied countries, and that they have been coerced into this sort of work by threats of retaliation against their families. Other stool pigeons may be men with private grievances, which the Germans have encouraged and played upon.

Most often, it would seem, the companion assigned to a prisoner of war is simply a German who knows one of the United Nations very well, who speaks English perfectly, and who appears to be just another prisoner.

An alternative method is to give the prisoner a period of solitary confinement. The Germans hope that prisoners will no longer resist interrogation after having been kept alone for a considerable time, and that

when they are treated decently afterward, they will be glad to talk readily.

For certain prisoners, the method of "friendly" interrogation is used at the very beginning. The questioning takes place in a comfortably furnished room, and the interrogators take pains to keep the whole thing on the level of an informal chat. The serving of alcoholic drinks is intended to play an important part in this method.

Naturally, efforts are made to convince the prisoner that he need not fear to talk, inasmuch as everything about his unit is already known. It is reported that at certain German interrogation centers the prisoner is seated near a shelf of books purporting to give the history of each unit, together with names of personnel, details of losses, and so on. The interrogation officer may even start by reading aloud a few entirely correct statements, hoping that this will lead the prisoner to talk freely and, in so doing, to reveal other information, which is not yet known and which is badly needed.

German officers sometimes invite prisoners to parties, which last until four or five in the morning. There is always plenty to drink at these affairs. The Germans of course do everything they can to start friendly discussions with the prisoners, in the hope that eventually one man will grow talkative and that others will then follow suit. This method is dangerous, and no one should be so misguided as to think that it is safe for him to talk "just a little" on the grounds that he "knows when to stop."

Section V. MISCELLANEOUS

1. COUNTERATTACK TACTICS (MARETH FRONT)

The following notes deal with German counterattack tactics employed on the Mareth front in Tunisia from March 21 to 23.

a. Use of Tanks

In an attack against certain British positions, German tanks were not used in direct cooperation with the infantry. Instead, the tanks assembled—a maximum of 20 at a time were observed—and began to move in mass toward the British. After covering a short distance, they split into groups of three. Each group worked its way forward on its own, always attempting to reach the British flank. The groups advanced by bounds, moving from one hull-down position to another, and halting at each to shell and machine-gun the British positions.

b. Infantry

Detrucking under the concealment afforded by palm trees in the tank assembly area, the infantry

worked its way forward stealthily, making good use of ground. Snipers were very active, and protected the infantry's advance in an efficient manner. The mission of the infantry always appeared to be to gain possession of commanding ground, from which British positions could be observed and made untenable.

c. Fire

In preparing for the attack, the Germans made extensive use of mortars. The fire was intense and accurate, and gave evidence of extremely good observing.

The Germans often fired tracer ammunition to indicate, to heavier guns sited further back, which targets were especially worth attacking.

In one instance, when the British had captured a position and had shown a success signal, the Germans sent up a white Very light. German artillery at once placed fire on the lost position.

d. Panzer Grenadiers

It is reported that at least one attack in which Panzer Grenadiers took part was completely broken up as a result of British medium (U. S. heavy) machine-gun and 75-mm mortar fire, and that casualties were numerous.

At Zaret Sudest a German position, which apparently was held by a company of Panzer Grenadiers, was the scene of heavy hand-to-hand fighting in the

communication trenches, of which the Germans made full use, throwing hand grenades and sniping at close range.

2. ENGAGING A BRITISH OBSERVATION POST

On one occasion in North Africa a British observation post was engaged by seven enemy tanks, of which only six fired. The seventh, the commander's tank, was at the halt about half a mile away. After one of the six tanks had got the observation post's range, all began to fire for effect. They were employed rather like a 6-gun battery, with the commander's tank apparently controlling the others. The range was 7,000 yards.

British 25-pounders (88-mm gun-howitzers) responded with heavy fire. The enemy then attacked the observation post with 15 tanks and two 75-mm guns. As soon as the enemy fire was effective, one of the tanks placed its fire behind the observation post while the remaining tanks carried out a flanking movement.

3. TANK-BORNE INFANTRY

The Germans have been known to follow a wave of tanks with a second wave carrying infantrymen, 15 to a tank. The general rule has been for the infantrymen to jump off as close to their objective as the

nature of the terrain and hostile fire permit. It is reported that under favorable circumstances, they may ride on the tank until it is within 30 to 10 feet of the blind side of a pillbox, for example.

4. REACTION TO BRITISH USE OF SMOKE

A message from a German army to a corps indicates German response to the use of smoke—in this instance, by the British.

In case the enemy makes use of smoke, units must immediately open fire with machine guns and artillery on the area where the smoke is. We have found from experience that the enemy moves his infantry forward and carries out concentrations, movements, and replacements under the concealment afforded by the smoke. In such cases intense machine-gun fire obtains excellent results.

As far as our resources permit, our own troops must use smoke to conceal their own movements.

5. FLAK IN THE FIELD

Although a Flak (German antiaircraft artillery) unit in the field remains subordinate to the German Air Force in all matters of administration, it is operationally subordinate to the commander of the army unit to which it is attached. The use of Flak in cooperation with the army is highly flexible, and the scale and method of employment vary, often on short notice, according to the tactical situation. When Flak units

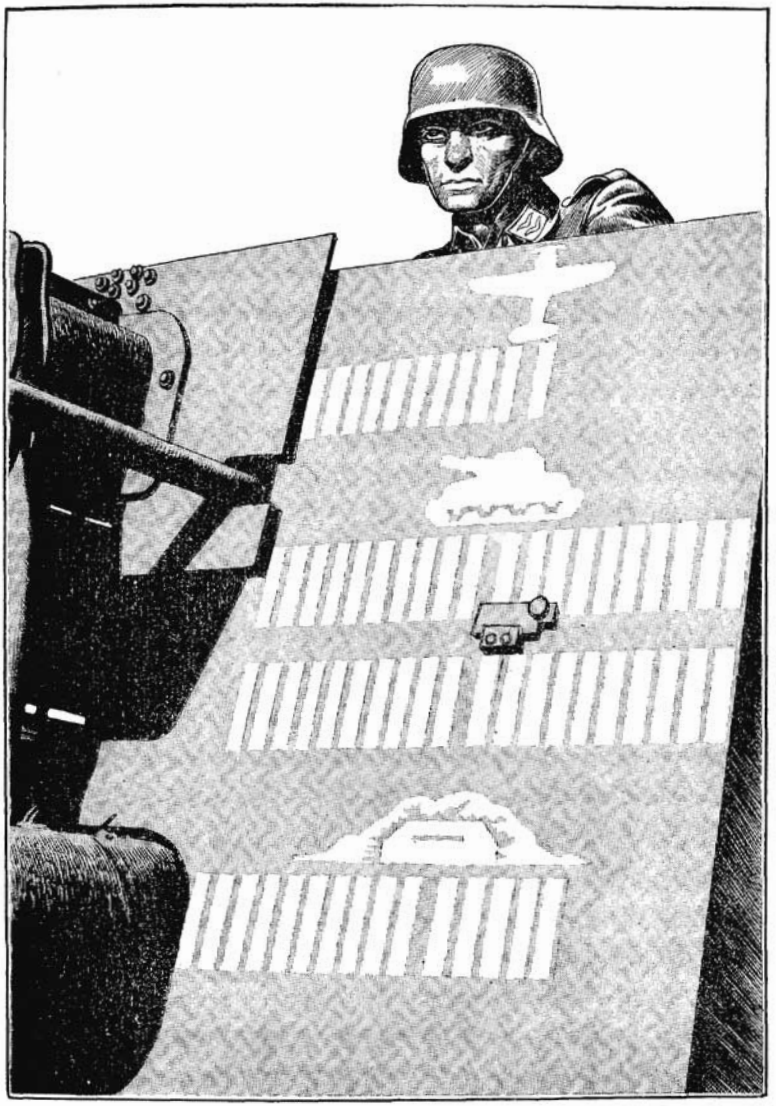

Figure 5.—Combat Score on German Flak Gun Shield

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are assigned to divisions, first consideration is usually given to armored and motorized components.

All Flak guns up to and including the 88-mm are dual-purpose, and when units are attached to the field army, they carry armor-piercing and percussion-fuze as well as time-fuze ammunition.

In all the campaigns of the present war, Flak units have been active in the front lines, where the heavy guns, in particular, have been used increasingly against armored vehicles, artillery positions, and fortifications.

Flak gun crews are permitted to paint a record of their successes on the shields of their guns (see fig. 5). The Germans feel that this encourages a competitive spirit which not only strengthens morale, but which leads directly to greater efficiency on the part of the crews.

6. DEFENSE OF VILLAGES

As a rule, if the Germans believe that a town or village in their possession is likely to be attacked, they prepare it for all-around defense. In the outskirts of the populated area, they generally construct a belt of field defenses around the town, with ditches, minefields, and other antitank obstacles protecting all approaches, and with every obstacle covered by fire according to a well coordinated plan.

Within the populated center itself, the German defense plan is based on the theory that in all street fight-

ing, the element of surprise is important. Certain buildings are transformed into fortified strongholds, and several such buildings, capable of mutual fire support, become a center of resistance. Streets and houses which are outside these zones are covered by small-arms fire.

The ground floor of a fortified point is usually reserved for such heavy weapons as guns, antitank guns, and mortars. Artillery and mortars are also emplaced in parks, gardens, and courtyards, where the Germans believe that they can be especially effective in repelling tanks. Tanks may be placed in ambush inside barns or other buildings; also, they may be cleverly dug-in around the outskirts of the town to cover possible avenues of tank approach.

Heavy and light automatic weapons, snipers, and grenade throwers are dispersed throughout the upper floors of buildings and on roofs.

If one or two buildings of a fortified zone are lost, the Germans try to counterattack vigorously before the opposition has had time to consolidate its gains.

7. DEMOLITION PRECAUTIONS

The Germans now include as part of their normal equipment means of destroying anything which should not be allowed to fall into our hands. In addition to their regular ammunition, guns are allotted charges to be placed in the barrels so that the equipment may be

thoroughly demolished. Drivers are equipped with grenades to destroy their own vehicles. Company headquarters keep on hand a bottle of gasoline to pour over all classified documents. They also have another incendiary bottle, not unlike the phosphorous bomb used in close combat against tanks. Just in case this does not function, a box of matches is kept in reserve. The German theory is that if they allow us to capture anything intact, their loss is double—we gain a tank, for example, while they must call for a replacement.

PART TWO: JAPAN

Section I. JAPANESE USE OF SMOKE

1. INTRODUCTION

Although the Japanese have gained considerable experience in the use of smoke in China, they have used it very little to date against United Nations forces in the Southwest Pacific.

The Japanese are known to possess several types of smoke-producing equipment and to have personnel trained for smoke operations. Temporary smoke companies (infantry regimental smoke units) are formed from infantry regimental personnel (5 to 10 men from each company) who have been trained in chemical warfare duties. These men perform ordinary company duties except when detached for chemical warfare services. The enemy also has field gas companies (each about 220 strong), which are allotted to divisions for specific operations. Each of these companies carries 3,240 smoke candles. (Whether they are toxic, the ordinary type, or include both, has not been reported.) When the use of smoke is planned on a large scale, these smoke companies may be formed into temporary

smoke battalions—probably three companies to the battalion.

Various types of Japanese smoke-producing equipment—including smoke candles, a rifle smoke grenade, and grenade-discharger smoke grenades—have been reported by the Intelligence Branch of the U. S. Chemical Warfare Service. Reports on these items of equipment constitute the major part of this section.

2. TYPE 99 SELF-PROPELLED SMOKE CANDLE

This candle consists of three main parts: an outer cylinder 8 inches long and 2 inches in diameter, an inner container (which is the candle proper), and a propelling charge.

One report states that the candle is painted light gray, with a white sighting line along the side, whereas another report states that it is olive drab in color. Both reports give the total weight as 2.8 pounds, including the smoke mixture, which weighs 1.41 pounds. The mixture consists of hexachlorethane, 56.5 percent; zinc dust, 30 percent; zinc chloride, 2.8 percent. and zinc oxide, 10.7 percent.

To operate the candle, the top and bottom slip-on covers (sealed with adhesive tape) are removed, and the candle is placed in an inclined position by means of an attached spike (see No. 4 of fig. 6), which is slid to the bottom of the cylinder and then pushed into the ground. The fuze (10) is ignited from the match head (3), which, in turn, ignites the propelling charge. The explosion shoots the inner container a distance

of 131 to 306 yards, according to the angle at which the spike is driven into the ground. The smoke mixture is ignited by means of a fuze after a delay of 4 to 5 seconds.

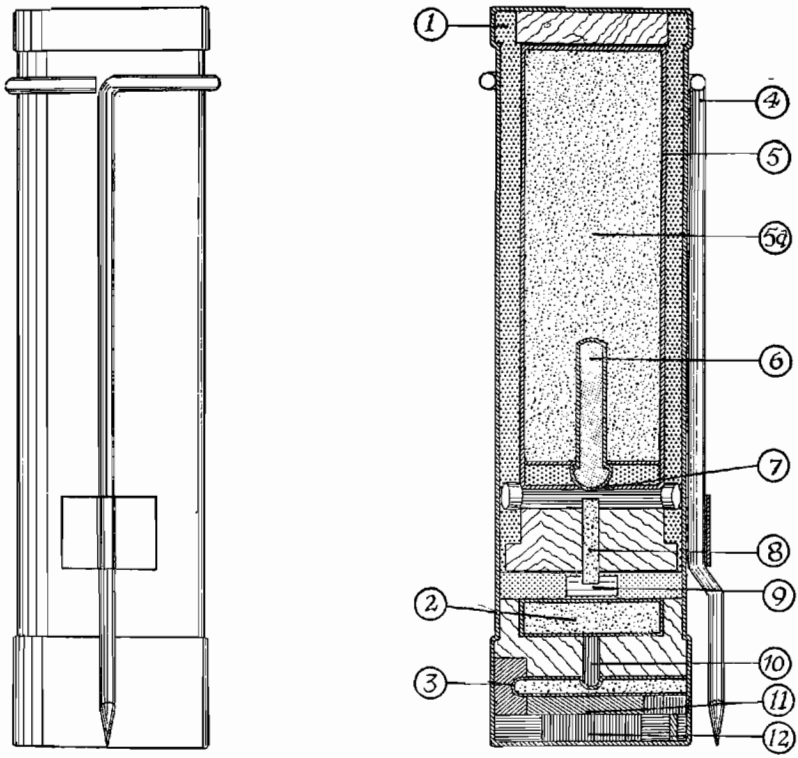

Figure 6.—Type 99 Self-propelled Smoke Candle.

KEY TO DIAGRAM

1. Felt packing.
2. Propellant.
3. Match head.
4. Spike.
5. Cardboard tube.
5a. Smoke mixture.
6. Fuze.
7. Fuze cap.
8. Fuze.
9. Paper wads.
10. Fuze.
11. Abrasive surface.
12. Igniting block.

3. SMOKE GRENADE (for grenade discharger)

This smoke grenade, about 6 inches long and 2 inches in diameter, is fired from the 50-mm Type 89 heavy grenade discharger.[1] It can be projected a dis-

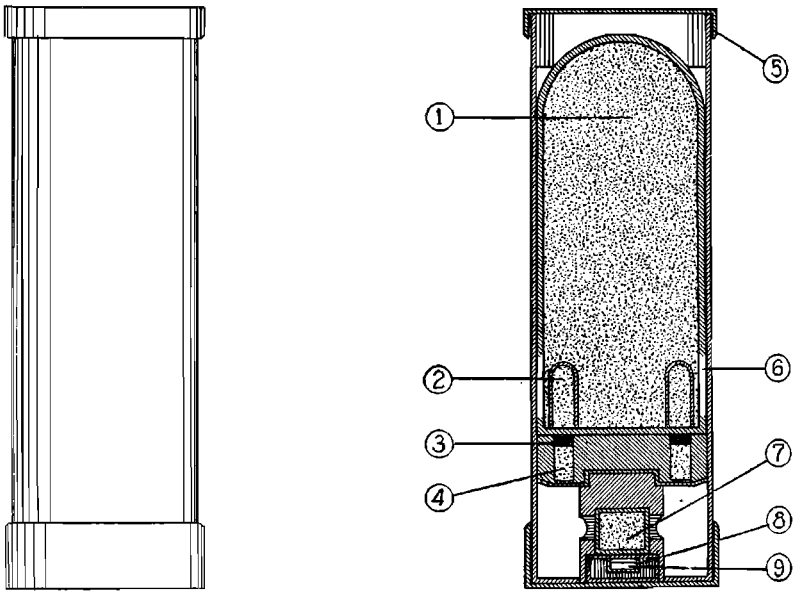

Figure 7.—Smoke Grenade (for grenade discharger).

KEY TO DIAGRAM

1. Smoke-producing mixture.
2. Powder charge.
3. Flash vent.
4. Delayed-action fuze.
5. Soldered top.
6. Smoke vent.
7. Propellant.
8. Detonator.
9. Percussion cap.

[1] A detailed report, based on U. S. Ordnance findings, was given on Japanese grenade dischargers in the May, 1943, issue of the *Intelligence Bulletin*, page 15.

tance of 45 to 206 yards, according to the adjustment of the discharger.

The propellant weighs 4.24 ounces and the detonator .25 ounce—no other weights are given.

Before being used, the grenade is removed from its outer cover. The delayed-action fuze (see No. 4 of fig. 7) becomes ignited from the explosion of the propellant (7), and passes to the powder charge (2), which ignites the smoke mixture (1).

4. TYPE 94 SMOKE CANDLE (Small)

The container of this candle is 7.25 inches long and 2.1 inches in diameter, and is painted green. The markings (see No. 15 of fig. 8) show the usual details of the date and place of manufacture. The total weight of the candle is 2.17 pounds, including the smoke-producing (Berger-type) mixture. The mixture itself weighs 1.87 pounds, and consists mainly of carbon tetrachloride, zinc dust, and zinc oxide.

In operation, the sheet-iron cup (6) burns off with the igniter, and consequently starts the burning of the smoke-producing mixture.

5. TYPE 94 SMOKE CANDLE (Large)

This candle is a larger model of the Type 94 described in paragraph 4. It differs mainly in the method of ignition, which apparently is done by means of a cord attached to the igniting apparatus. (See fig. 9.)

The length of this candle is 31.5 inches and the di-

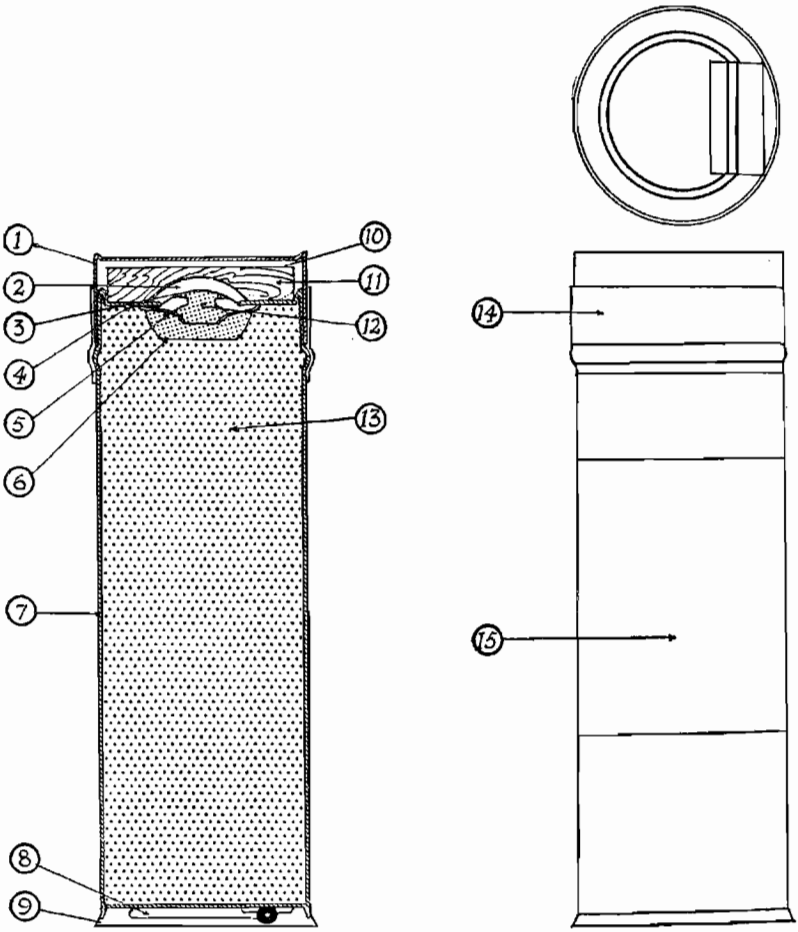

Figure 8.—Type 94 Smoke Candle (small).

KEY TO DIAGRAM

1. Top cover.
2. Cotton wad.
3. Tin-foil cover.
4. Inner lid (sheet iron).
5. Lead seal.
6. Sheet-iron cup.
7. Body.
8. Handle.
9. Base.
10. Abrasive surface.
11. Igniting block.
12. Igniter.
13. Smoke-producing mixture.
14. Adhesive band.
15. Markings, etc.

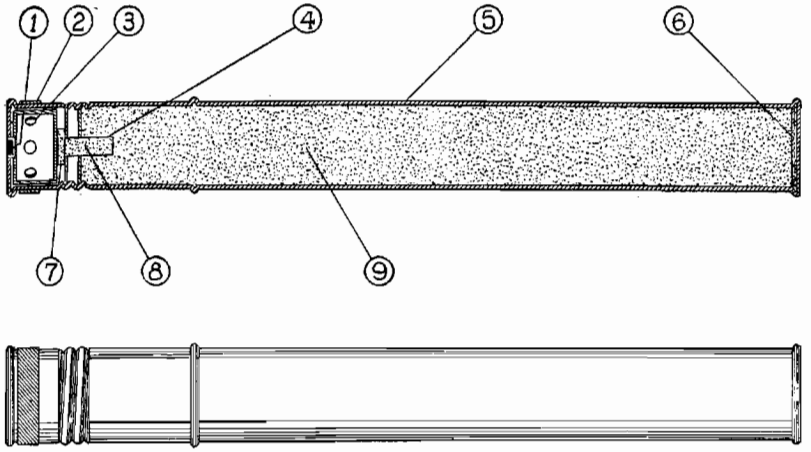

Figure 9.—Type 94 Smoke Candle (large).

KEY TO DIAGRAM

1. Connection for cord to ignite fuze.
2. Adhesive band.
3. Smoke vents (8 in number).
4. Fuze tube.
5. Body.
6. Cardboard.
7. Ignition cap.
8. Igniting powder.
9. Smoke-producing mixture.

ameter is approximately 3⅓ inches. The total weight is given as 16.5 pounds, including the smoke-producing mixture (Berger-type) which weighs 15 pounds.

6. TYPE 94 FLOATING SMOKE CANDLE (Model B)

This type of smoke candle floats on water by means of an inflated rubber tube. The candle has a supporting ring with two lugs, to which the tube is fastened. (See fig. 10.)

Figure 10.—Type 94 Floating Smoke Candle (Model B).

The candle, painted a dark gray, is 31.18 inches long (792 mm) and 3.11 inches in diameter (79 mm). The total weight of the candle is approximately 12.47 pounds (5,660 grams), and the smoke-producing mixture weighs approximately 10.8 pounds (4,910 grams).

The fuze used is known as the "10th-year pattern hand-grenade time fuze," according to a label on the box in which a fuze was packed. The fuze is removable. It is taken out and carried separately when the candle is transported. The candle itself is sealed by use of the "wing-nut" plug.

The candle may also be supplied with a delayed-action igniter. This igniter is constructed in a manner similar to the "10th-year pattern hand-grenade time fuze," except that the striker and detonator are replaced with a length of ordinary time fuze, one end of which is sealed into the igniter itself. The igniter screws into the candle; it is used when a delay greater than the 4 to 7 seconds delay of the hand-grenade type is required. To ignite the fuze, the Japanese provide a match head in a thin metal tube attached to the other end of the length of fuze.

The smoke-producing mixture is composed of hexachlorethane, 50 percent; metallic zinc, 23.5 percent, and zinc oxide, 26.5 percent.

Details on how to operate the candle are given in a label on the outside of the weapon. A translation of the instructions reads as follows:

a. Make sure the cover plate is satisfactorily fixed.

b. Examine the floating belt to see whether is is sufficiently inflated.

c. Do not remove the waterproof strip on the tube [candle].

d. When using the candle [equipped with the 10th-year pattern hand grenade time fuze], hold the candle with the left hand, very carefully remove the safety pin from the fuze, and hit the head of the fuze firmly with a wooden billet. Then it is necessary to point the tube in a direction where the smoke emitted will not be dangerous.

e. When using the delayed-action igniter, cut the length of the fuze so it will burn the required time. After attaching the special ignition point, strike the match head of the ignition point with a scratch block.

f. When ignited, throw the candle into the water immediately by grasping the upper and lower parts so that the candle will be at right angles to the surface of the water.

g. Because a faulty smoke action might cause an explosion, move at least 10 yards away at the first sign of smoke, and do not approach until the smoking has finished.

7. 10-KG NAVAL SMOKE CANDLE

This candle, painted gray, is approximately 9.5 inches long and 6 inches in diameter. The total weight is 20.5 pounds. A paper name card on top of a captured candle bore the followin: "10-kg smoke candle, made . . . 1941."

The candle container, made of iron, is cylindrical in shape and is closed at either end by tin-plate disks.

It is made airtight by the soldering of all seams. A single hinged carrying handle (see fig. 11) is riveted and soldered to the container near the top. The ig-

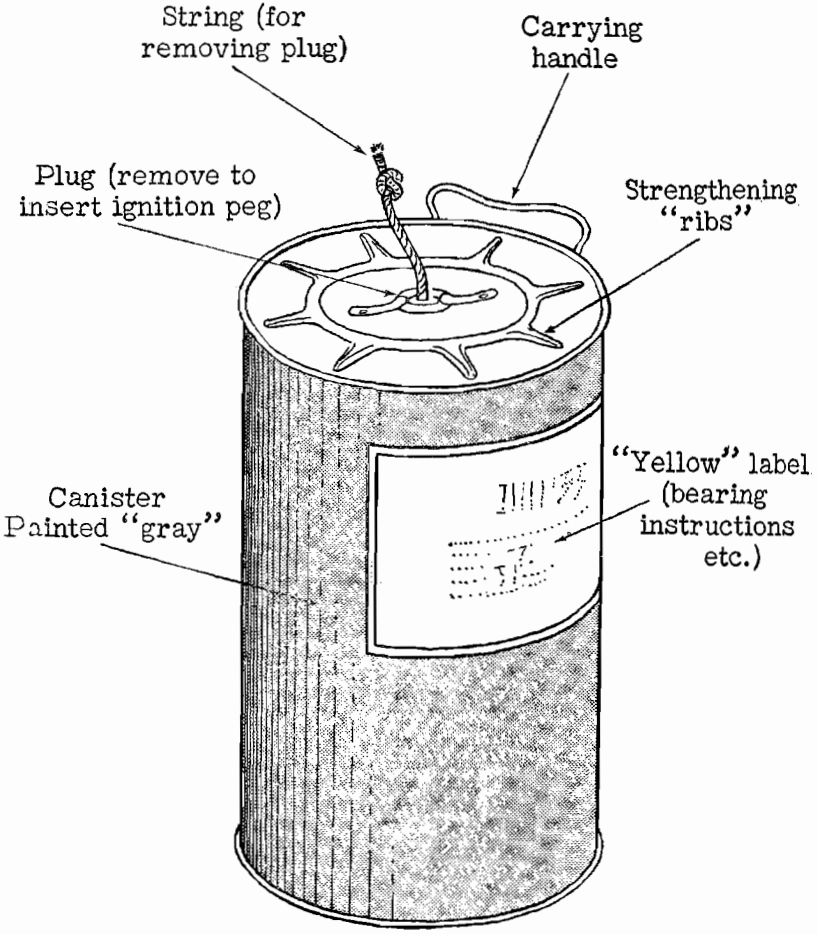

Figure 11.—10-Kg Naval Smoke Candle.

niter apparatus fits into a hole in the center of the top. A wooden plug is provided to fill the hole while the candle is being transported.

This smoke candle is believed to have been designed for use on the rear of a boat or ship, as well as on land. An instruction label on a captured candle stated that it "may be used aboard ship if placed on a sheet of iron."

According to the instruction label, the candle is filled with Berger-type smoke mixture, which, when ignited, gives off an ash-colored smoke for 3 to 4 minutes.

The label also stated that "an ignition apparatus is supplied separately, and is kept in the container. It consists of an ignition peg and a striking plate."

Other instructions given include the following:

a. Methods of Operation

(1) Remove the paper name card and plug from the top.

(2) Insert the ignition peg firmly into the ignition-peg chamber.

(3) Rub the match head of the ignition peg with the striking board.

b. Points on Using

(1) Sparks are given off during ignition, so wear working gloves and turn your face away when striking.

(2) Immediately before use, drill some small holes in the upper plate to relieve excess pressure from expansion—which usually occurs during storage or when exposed on decks, and so forth. If the candle is not used after the holes are drilled, the gas will escape unless you fill the holes with solder.

(3) If the contents are severely shaken in transport and there is doubt whether part of the smoke-producing content has leaked out, do not use the candle.

(4) Burning particles are liable to fall within a radius of 3 yards when the candle is burning, so the candle must not be used near inflammable materials.

c. Instructions for Storage

(1) Do not pile candles on top of each other.
(2) Avoid handling them roughly.
(3) Keep them in a cool place.

8. RIFLE SMOKE GRENADE

The rifle smoke grenade is used with a special adapter, which fits over the end of the standard Japanese 6.5-mm rifle barrel. The force to propel the grenade and the primary means of ignition are furnished by the .256-caliber Japanese cartridge (6.5 mm), which is loaded with 1.927 grams of powder and fitted with a wooden pellet. This cartridge is wrapped in paper and stored in the grenade tube.

The grenade, weighing 1.29 pounds and having an over-all length of 8½ inches, is painted a silver color and thoroughly waterproofed with coats of heavy lacquer and paraffin. The nose and body proper, 2 inches in diameter, are made of tin plate. The base, stamped from sheet steel, is screwed onto the body by means of rolled threads. Four smoke vents are placed at 90-degree intervals around the base, and are covered with light sheet metal disks, which are held in place by waterproof cement covered with paraffin. The

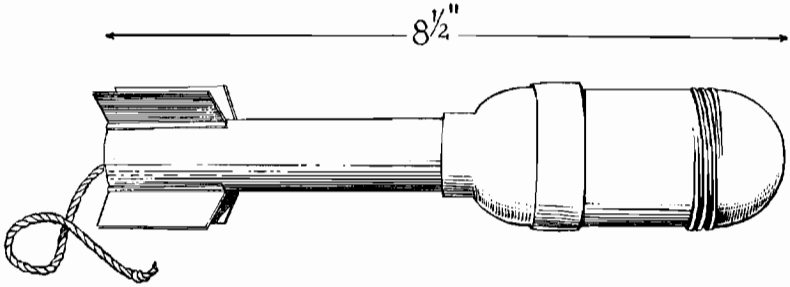

Figure 12.—Rifle Smoke Grenade.

grenade has three flash ports, spaced at 120-degree intervals in the bottom of the base. (See fig. 12.)

Four fins, made of tin plate, are soldered to, and equally spaced around, the grenade tube. The fins are 2⅜ inches long and 11/16 of an inch wide; the tube is 1 3/16 inches in diameter.

The smoke-producing mixture, which weighs .6 pound, is composed of the following:

	Percent
Hexachlorethane	56.2
Zinc dust	27.6
Zinc Chloride	2.9
Zinc Oxide	13.4

9. SMOKE-SCREEN OPERATIONS

Japanese plans for the use of smoke to screen the unloading of troops and supplies at and near Lae, New Guinea, are revealed in an enemy document, which is paraphrased below. Three *han* (at normal strength a *han* is roughly equivalent to our squad) were selected for the operations, under direction of a first lieutenant.

Each *han* was given the responsibility for screening a separate area (see fig. 13).

a. Personnel and Equipment

(1) *No. 1 Han.*—This unit was composed of a sergeant major as leader, another noncommissioned officer, and 20 privates. If was allotted six collapsible boats. If needed, an armored boat or high-speed boat also would be allotted. This *han* was to use 200 smoke candles of the floating type, 10 of the Type 94 (large), and 160 of Type 94 (small).

(2) *Nos. 2 and 3 Han.*—Each of these units was allotted a noncommissioned officer as leader, 15 privates, and the following equipment: 100 candles of the floating type, 7 of Type 94 (large), 120 of Type 94 (small), and three collapsible boats.

In addition to the equipment allotted to the above *han,* the Japanese document stated that 400 of the floating-type candles "are to be kept in readiness" [probably as a reserve].

b. Laying the Screen

Regarding the actual operation, the document included the following:

> Regulations for the formation of smoke screens are to be based upon orders from Debarkation Unit Headquarters.
>
> When operations begin, all smoke candles are to be lighted at the same time—when the signal shots (red dragon parachute flares) are fired.

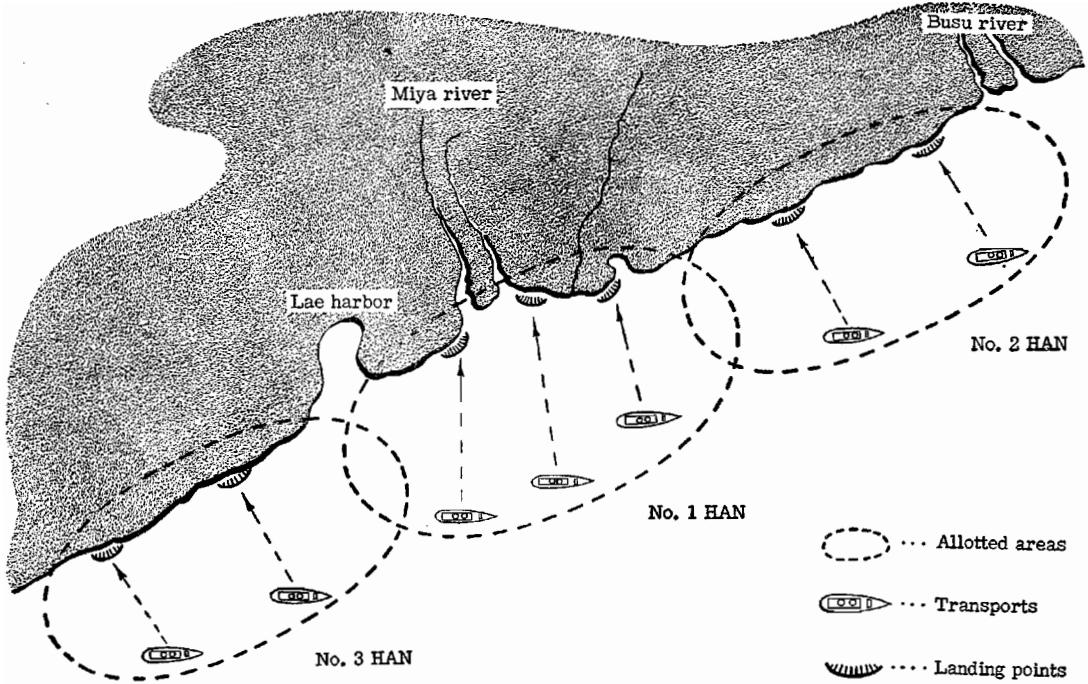

Figure 13.—Japanese Smoke-screen Plans.

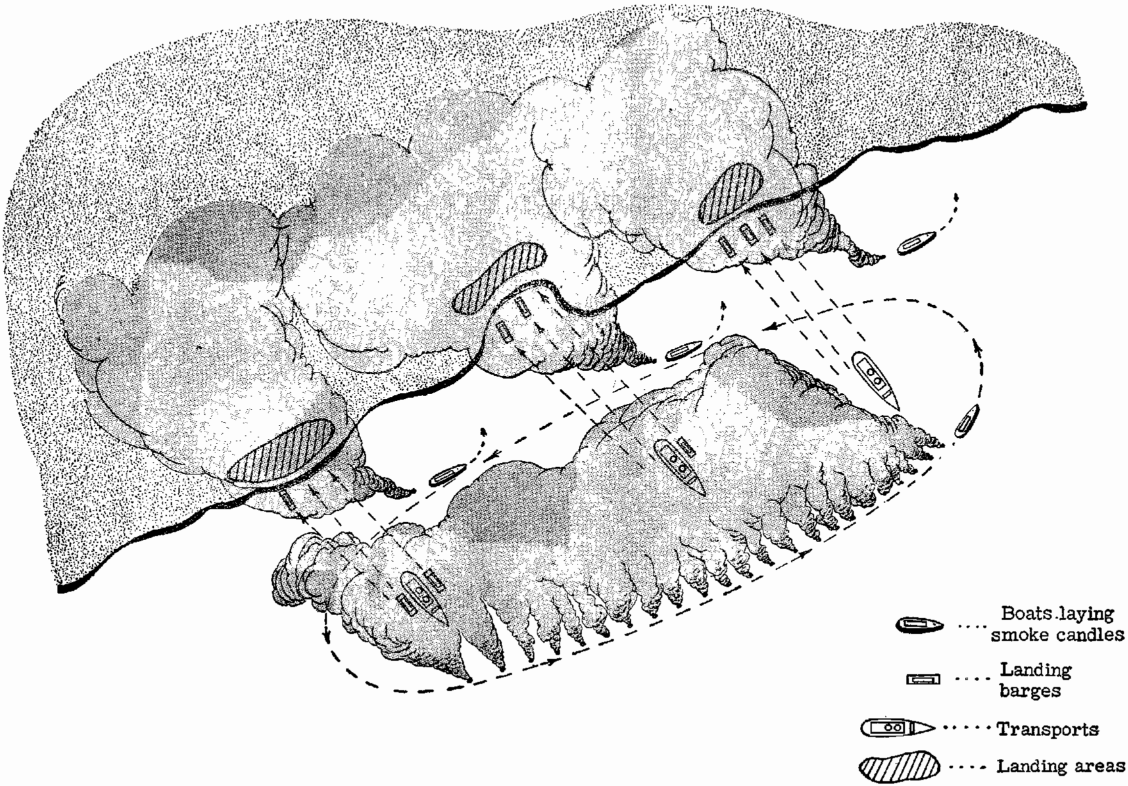

Figure 14.—Japanese Smoke Laying

The main smoke operations are to be carried out by boats over the designated water area. Smoke operations also will be conducted over land, according to circumstances.

[A study of the Japanese diagrams (figs. 13 and 14) indicates that, in this operation, the enemy planned to lay a smoke screen over the designated area by placing the floating-type candles at certain intervals in the water, and, if necessary, to operate the Type 94 candles on adjoining land areas.]

c. Care of Candles

In connection with the candles, the following steps will be taken:

(1) The candles must be exposed to the sun to keep them dry.

(2) Candles, torch lamps, and so forth are to be used for lighting purposes.

(3) Smoke candles are to be lighted from smoke candles which already have been lighted.

(4) In order to avoid the danger of explosion, all personnel will keep away from the candles after they have been lighted.

Section II. NOTES ON BOATS AND SHIPS IN AMPHIBIOUS OPERATIONS

1. INTRODUCTION

The Japanese are showing an increasing tendency to use motor landing barges instead of ships for transportation within range of United Nations aircraft in the Southwest Pacific. This change of policy is probably due to heavy Japanese losses in transports and destroyers as a result of air attacks.

The substitution of motor landing barges for transports would complicate Japanese shipping problems, but it would lessen the dangers from air attacks, because: the barges are comparatively small, they can be concealed during the day beneath overhanging trees or even camouflaged on an open beach, and they can operate at night in shallow, reef-infested waters where they are comparatively safe from destroyers and PT boats.

The 4,000-ton (gross) Japanese transport, commonly used for amphibious operations, can load 4,500 long tons, transport it 300 miles, and unload it in about 4 days.

In contrast, the large-type Japanese landing barge (*daihatsu*) can load a maximum of 15 long tons, transport it 300 miles, and unload it in 5 days.

Therefore, for a distance of 300 miles, 375 large landing barges would be required to do the work of a 4,000-ton transport.[1] These figures, derived from a mathematical formula, should not be applied at shorter or longer distances because the relative capacity of motor landing barges decreases with distance.

The Japanese are known to have experimented extensively with the use of small boats (mostly landing barges) for the transportation of personnel and matériel, both during and after landing operations. A Japanese experiment with both large and small types of landing barges was conducted comparatively recently in tropical waters of the Southwest Pacific. Their conclusions regarding such matters as boat capacities, use of various types of weapons on the boats, methods of unloading, and the provision of food and water are contained in documents, which are paraphrased below.

2. BOAT CAPACITIES

Japanese conclusions with regard to the capacity and efficiency of landing barges for transporting various

[1] According to a Japanese document, the large-type landing barge is 49 feet long, 11 feet wide, and has a capacity for 10 horses, or a tank and an automobile. The speed of the boat is about 8 knots. The crew numbers seven.

types of troop units and equipment across large bodies of water are summarized below. The conclusions are based on experiments conducted over a distance of approximately 50 nautical miles. Using both their large- and small-type landing craft, the Japanese made the trip in 7 hours.

a. For Large Landing Barge (*Daihatsu*)

Unit	*Personnel*	*Equipment*
Rifle Co	50	None.
MG Co	40	3 HvMG.
Inf Bn gun unit	40	2 70-mm How (1 in bow ready for firing; 1 dismantled in stern).
Inf Regt Arty unit	35	1 75-mm gun.
Mt Arty unit	35	1 75-mm gun.
Rapid-fire gun unit	28	2 37-mm guns.
L Armd-c unit	15	1 L Armd-c.

[Comment: In the loadings shown above, consideration was given to the comfort of occupants, facilities for cooking, and defensive use of weapons. For landing operations where distances are fairly short, these barges could carry considerably more tonnage—probably twice as much in the case of rifle and machine-gun companies. When the large barge is used as a command boat, the Japanese recommend that 25 to 30 men make up the load.]

b. For Small Landing Barge (*Shohatsu*)

Unit	*Personnel*	*Guns*
Rifle Co	25	None.
Rifle Co	20	1 HvMG.

[Comment: Capacities for units equipped with heavy weapons are not given, indicating that the small barge is not considered

suitable for carrying troops and heavy equipment on a run of a full day.

For landing from troop transports, the above capacity figures for the small landing barge probably should be about doubled.]

3. CONVENIENCES FOR PERSONNEL

a. Except in the case of tank and armored-car units, benches for the men to sit on are absolutely necessary on long voyages. They must be thrown overboard before landing because it would be inconvenient to unload them.

b. Rifles should be placed in an arms rack. The best positions for the racks are in the stern or in both sides of the boat.

c. Lowering of the floor boards when there are no waves will provide better ventilation and lessen fatigue.

d. The bow operator gets tired quicker than others because he has no shelter; therefore, it is advisable to relieve him often.

e. Personnel in the small barges should stand up for 10- to 15-minute intervals from time to time.

f. Tents are absolutely necessary. Shelter tents are thin and very hot.

g. If possible, provide a utensil in each boat for boiling water.

h. A half canteen of water [per day] is necessary for drinking, in addition to the amount consumed with meals.

i. Coconut milk is very good for drinking.

j. The best method for carrying and preserving rice is to put it in a rice basket and add 3 or 4 pickled plums. [The plums are preserved by a salt solution.] Rice kept in this manner will not spoil for 17 hours or more. If it is carried in a rice box, without pickles, it is liable to spoil after 11 hours. In any case, rice must be cooked hard and its container must be dried thoroughly.

Rice carried in a mess kit, without pickles, will keep for 13 hours.

4. ARRANGEMENT OF WEAPONS

a. Rifle

The rifle should be rested on sandbags, which are to be prepared and placed on the sides of the boat for this purpose.

b. Light Machine Gun

Rather than have it handled by two men, the light machine gun should be rested on the sides of the boat for firing. It occupies too much space when handled by two persons, and the firing of rifles is interrupted.

c. Machine Guns

When using a rest for antiaircraft fire, the firing will be the same as under ordinary circumstances. In circumstances under which the rest is not used for antiaircraft firing, arrange the weapons as follows:

(1) When the left (or right) side of the boat and sandbags are used, remove the cotter pin of the cog and lower the cog sufficiently. Remove the barrel cover pin, swing the barrel in the opposite direction, and replace the pin. Essentials for aiming correspond to those for the light machine gun.

(2) When manpower is used [to hold the gun while firing], take down the gunshield and rest the front and rear legs of the weapon on the two sides of the boat. To fire, remove the barrel from the legs, tie ropes around the barrel, and hang it a suitable height.

d. Antitank Gun

To operate an antitank gun from a large boat, the No. 3 and No. 4 gunners will fire from a standing position. When adjusting the range sights, make no change in elevation, but change the direction slightly. Contact the boat captain beforehand and have the boat proceed toward the target. Depending upon the action

of a moving target; set the sights at the bottom or top center, and pull the trigger when the boat is at the crest of a wave.

e. Mountain Gun

In making arrangements for firing this gun from a large boat, pile three square pieces of timber at the 10th rib to make a brace for the legs and the trail spades; put two sandbags on each of the trail spades, one bag under each wheel, and two bags on each wheel in order to prevent the gun from jumping up. At the same time, tie the wheels to the rings on the sides of the boat with ropes.

In operating the mountain gun from the boat, show the target clearly to the boat captain and have the boat advance straight toward the target. In other particulars, operate according to the essentials of direct fire. However, when the waves have a disturbing effect, fire when at the crest of a wave.

5. NOTES ON UNLOADING

Japanese instructions dealing with the unloading of troops and matériel from ships at a New Guinea port and on Guadalcanal are contained in enemy documents which are paraphrased below.

a. New Guinea

The order of unloading is mainly as follows:

(1) Land duty personnel [including unloading detail], and their necessary equipment;

(2) Antiaircraft guns (with ammunition), motor vehicles, heavy matériel (including artillery), and the personnel who operate them;

(3) Supplies, including medical stores, important articles for all units, and the necessary handling personnel;

(4) Matériel of units and the necessary handling personnel;
(5) Personnel assigned to ship duties during the unloading.

In regard to munitions ships, fuel should be removed from them first, and as fast as possible, in order to lessen the danger of fire.

Endeavor to keep intact the organization of small units, and progressively increase the unloading and transport details (particularly the latter) as the troops land.

In the past, personnel in a number of instances have hurriedly disembarked from transports to evade aerial bombing. This seriously reduced the number of duty personnel on board the ships—in some extreme cases, no one was left on board to direct operations. The result has been not only a serious delay in unloading but actually a failure in some cases to unload anything. Such occurrences must be avoided in the future and every effort put forward to unload everything down to the last articles, in spite of all difficulties.

The following paragraph on "Supplies" was included in the Japanese document:

During the unloading operations, the number of evening meals and snacks will be increased in accordance with the progress of operations. The water supply will be on the same basis. This will have a beneficial effect upon the progress of the work.

b. Guadalcanal

The order of unloading was practically the same as that given for the New Guinea port. Infantry units were unloaded ahead of the land duty personnel.

The "commander of the Guadalcanal Island unloading unit" was responsible for regulations governing the beach where the unloading took place.

(1) *Use of Lights.*—"Dangerous spots near the landing beach and dangerous reefs in the sea will be marked . . . with faint red lights just before the convoy comes in to anchor," the document stated. Other references to use of lights were as follows:

Strict control of lights will be enforced at night. Dim lights, utilized in such a way that they cannot be seen from the air or from the sea, may be used for the following purposes:

(a) For loading or unloading ships' holds;

(b) For the inspection or repair of engines on the boats; and

(c) For indicating danger or distress (use a red signal with a circular motion).

(2) *Rescue and Medical Care.*—Each company will prepare one rescue boat, and will be responsible for rescue work between the anchorage and the shore.

During the daytime, the rescue boats will be identified by displaying a Red Cross flag.

Those requiring rescue will make circular motions with their red light at night, and will wave their red flag horizontally in the daytime.

6. HOW TO DODGE PLANES

Of particular interest to air forces are two Japanese documents which describe evasive tactics of their ships during air attacks. These documents are paraphrased below.

In cases where the planes are sighted at least 4 sea miles away, turn toward the oncoming enemy immediately and increase your speed. When the planes are about to drop their bombs, change course at a large angle (full helm). When the

wind is fairly strong, change your course so as to receive a full cross wind.

When attacking planes are sighted close at hand (less than 4 sea miles), or when attacks are continuous, immediately carry out a large dodging movement. Subsequently, make continued large turns individually, without maintaining a set course. Strive to gain the benefits of cross winds as outlined above.

If you are in formation, break it and scatter according to circumstances.

Section III. SOME JAPANESE TACTICS OBSERVED IN BURMA

1. INTRODUCTION

The British-Indian drive on the Arakan front in Burma early in 1943 afforded an opportunity for studying some of the Japanese defensive tactics. In this campaign, the Japanese used most of their old ruses plus a few new ones.

This section is devoted to a discussion of the Japanese defenses and of those ruses or deceptive tactics which have not been reported previously.

2. DEFENSES

The Japanese apparently make a practice of using various types of defensive positions, according to the terrain, the time available for construction, and the strength of the enemy. On Guadalcanal and parts of New Guinea, they frequently established their defenses on low, jungle-covered ground, in preference to high ground. In Burma, where less jungle is encountered,

the Japanese usually established their positions on terrain heights and near the crests of heights.

An observer in Burma described Japanese defenses in one area as being of two types, temporary and permanent. The temporary types were small, self-contained, cleverly concealed squad posts, 30 feet in diameter and situated some 300 yards apart. They usually contained 10 men. These posts, designed for all-around defense, served as hideouts from which Japanese patrols operated at night.

The so-called permanent-type defenses, or main positions, were sited on natural obstacles. They contained mortars, for which the temporary squad positions probably served as observation posts.

Several of the enemy positions were situated along the edges of woods, and others were located from 30 to 40 yards inside the woods.

The Japanese had cut fire lanes for most of their positions. The lanes, extending out from the positions in different directions, usually were 15 to 30 feet long and never more than 2 feet wide.

An observer in another area reported that the enemy depended largely upon foxholes and individual weapon pits for defense positions in his forward area. Most of the positions were well camouflaged with natural foliage, and some of the foxholes were covered with lids resembling trap doors. Japanese soldiers would keep these lids down except for short periods of observation. Some of these positions were 4 feet deep.

Around the top of each position was a bundle of brushwood, about 2 feet high and tied together with wire. One of these posts contained three grenades, a rifle, an individual cooker, and an ammunition box full of rice and various papers—evidence of the self-contained nature of Japanese individual defense positions.

Other observers noted that many of the deeper Japanese defense trenches on the Arakan front were T-shaped or L-shaped.

A large number of trenches were not occupied. These "extras" were dug to allow the Japanese to shift from one position to another, for reasons of security. Observers believed that the enemy soldiers must have spent most of their time digging.

Usually the defending Japanese would hold their fire until the attacking forces launched an assault—sometimes from a distance as close as 50 yards. In accordance with previously reported enemy defense doctrine, the Japanese, if driven from their positions, will soon launch a counterattack. This attack starts with a shower of grenade-discharger shells and is followed immediately by a charge with automatic-weapon support.

Japanese foxholes in one area of the front were 2½ feet deep, and did not contain well-developed machine-gun positions. The foxholes were in two rings around the top of a hill, one just below the crest and the other spaced around the top of the hill. Additional

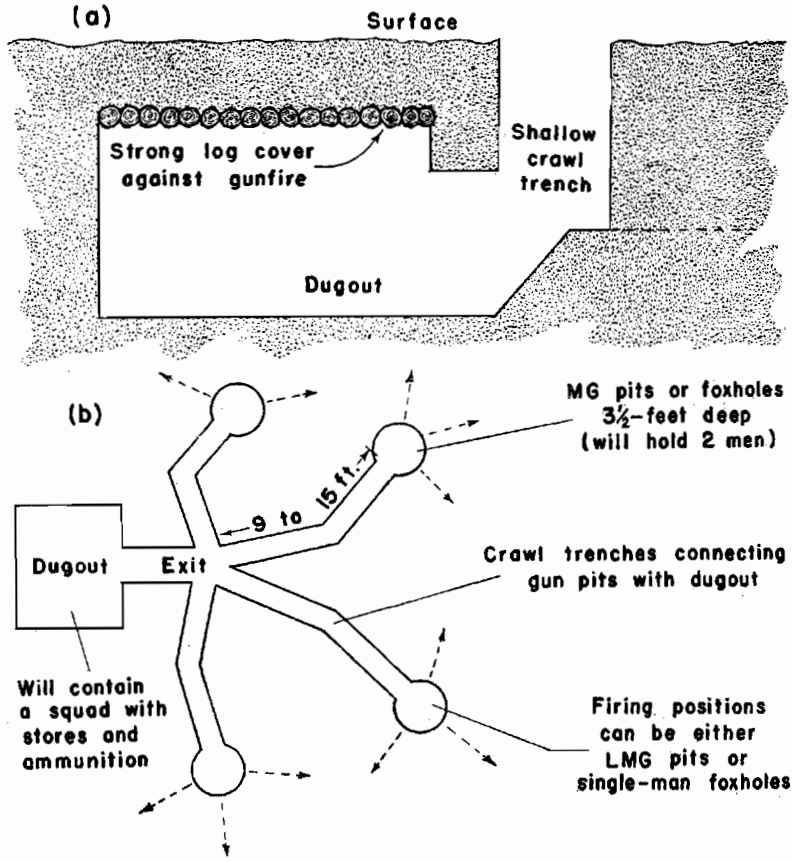

Figure 15.—Japanese Defense Post.

foxholes, of a different construction, were found at the bottom of the hill.

The Japanese have been reluctant to disrupt interlocking cross fire plans for their light machine guns when the guns were attacked from the front by infantry.

Almost invariably the Japanese will sacrifice a good light machine-gun target if firing would give away the location of a strategic observation post.

Figure 15 is a sketch of a Japanese defense post. While being shelled or bombed, the enemy probably fled to the dugout—realizing that he could abandon his light machine-gun posts without being assaulted while the shelling was actually in progress. In a tree which affords a view of all approaches to the position, the enemy built a combination sniper's nest and sentry post. One man could have kept watch during the daytime while the others slept or relaxed. Part (a) of the diagram shows how the dugout is constructed. Part (b) shows how crawl trenches are connected to outlying firing positions.

3. RUSES

Observers on the Arakan front described several Japanese ruses or tricks that had not previously been reported. These included the following:

a. Use of Cattle

Cattle left behind by Burmese fleeing the combat zone were driven by the Japanese into places where they

could be conveniently watched from under concealment. When natives bent on looting—usually two to four men travel together—tried to steal the groups of cattle, the Japanese would pop out and arrest them. The captives then were taken before a Japanese officer and questioned about the opposing forces (British). If the natives could not supply sufficient information (generally they couldn't), one of them was released to go back into the British lines and find out more, while his friends were held as hostages. If the released native did not return by a given date, the remainder of his group were shot for stealing. Since the native released would often be separated from his family by the Japanese if he failed to return, he generally came back with some information because it was the easiest way out, both for himself and his fellow looters.

b. Use of Patrols

Japanese patrols could always be counted upon to do the unexpected. They often withdrew from Japanese-held areas while these were being scouted by patrols of opposing forces. When the latter patrols reported back with the information that the enemy had fled, the Japanese would reoccupy the area with a strong force. When the opposition moved a considerable force into the area, the Japanese opened up with a murderous fire at close range.

c. Use of Exposed Men

The Japanese are particularly keen about using all sorts of ruses to draw mortar and automatic fire. On at least one occasion, an individual soldier, waving a flag, ran out into open spaces for this purpose.

When automatic fire was opened on him, he dropped to the ground while other Japanese, under cover, observed the location of the automatic weapon or weapons doing the firing, so they could open up on it a short time later.

d. Use of Tommy Gun

At night the Japanese have been known to send a man toward our lines with a Tommy gun and tracer ammunition. This gunner would fire in short bursts at places believed to be occupied by the opposing forces. When he was fired upon, he ducked to the ground while his pals in the rear tried to locate the positions of automatic weapons firing at the Tommy gunner.

If this gunner failed to receive fire from a position he moved on to another—all the time closing in on opposing positions until someone eventually fired at him with an automatic weapon.

e. Miscellaneous

(1) *Mortars.*—To escape detection, the Japanese mortars often began firing either immediately after our guns had fired or just after impact of our mortar bombs.

(2) *Dummy Men.*—In one area on the Burma front, the Japanese put up dummy men in an effort to fool the opposing forces. These dummies may have been corpses.

(3) *Imitating Signals.*—On at least one occasion, the Japanese fired red signals immediately after similar signals had been fired by the opposition.

Section IV. JAPANESE TACTICS AT MILNE BAY

1. INTRODUCTION

The information in this section summarizes the tactics used by the Japanese in and around Milne Bay, New Guinea. The terrain over which most of the operations took place consists, generally speaking, of a narrow coastal strip, varying from ¼ mile or less to 1 mile in width. It is composed mainly of thick jungle and waist-deep sago-palm swamps, with occasional coconut plantations scattered about near the villages. This narrow strip is bounded on the inland side with a chain of hills and mountains, some of which rise to a height of 3,500 feet. Deep gorges cut this range at several points.

The Japanese attack was carefully planned to take advantage of the terrain, and of extremely heavy rains which were falling at the time.

2. SUMMARY BY OBSERVERS

In summing up the Japanese tactics, United Nations observers stated that the meeting engagement is the

basis of Japanese combat training—their official regulations give more space to it than to any other form of combat. The Japanese believe that the meeting engagement provides for the best development of swift and decisive offensive action, and they deliberately seek it.

The meeting engagement offers the Japanese the added advantage of minimizing deficiencies in matériel—especially artillery—and in the support by combined arms. In addition, the Japanese feel that the meeting engagement will enable them: to seize and hold the initiative, to allow subordinate commanders to take bold and independent action, and to occupy important terrain features quickly.

Nearly all the Japanese tactics in the Milne Bay fighting were centered on attack. All defense positions were covered by a screen of snipers, who were difficult to dislodge.

No Japanese maneuver is ever attempted without including some ruse to deceive the opposition and to conceal the true intentions of the commander.

3. PATROLS

The size of Japanese night patrols encountered by our forces varied from 18 upwards, while day patrols averaged from 6 to 10 men.

As a rule, these patrols moved as a body and kept on or close to roads or trails. For reconnaissance, the Japanese did not employ fighting patrols, but used

scouts, who worked singly or in pairs. These scouts utilized the thick jungle to approach our defended localities or were left in hidden positions when the enemy withdrew from a night attack. The scouts lay very still while close to our troops and allowed our patrols and working parties to pass unmolested.

4. NIGHT OPERATIONS

The Japanese relied almost entirely upon night operations for which they appeared to be well trained.

a. Approach March

During the approach march, the Japanese moved rapidly, in groups of 20 to 30 and with little regard for flank protection. The main line of advance was the road or beach, and no organized groups or units appeared to have moved more than 300 yards from the road. If the Japanese had tried to secure their flanks, their speed of movement would have been cut down considerably. They talked a great deal during the approach, but were careful about lights. While assembling, and just before the attack, they maintained absolute silence. However, they had a tendency to bunch up while assembling.

b. The Attack

Once the attack began, the Japanese made a great deal of noise, by firing mortars, grenades, and firecrackers, and by calling and whistling. These noises were made to draw our fire and demoralize our

troops—and to boost their own morale at the same time.

The night attacks were made on a small frontage, but their mortars were fired well forward and to the flanks to give the impression of a large force advancing on a wide front. The rear elements appeared to be more widely deployed, for a probable flank envelopment.

When our troops opened fire, the Japanese tried to infiltrate around our flanks and to our rear. After assembling and taking up positions, these enemy troops attempted to rush our posts under the cover of mortar and grenade fire.

c. Withdrawals

The night attacks were suddenly broken off before daybreak. Chattering as they went, the Japanese withdrew along the road except for snipers and observers, who were left in trees close to our forward defense lines and along trails. A great deal of equipment was abandoned, but no wounded were left.

d. Use of Tanks

The Japanese used at least two light tanks, which had strong headlights. Some machine gunners rode on top of the tanks or followed close behind. Other infantry parties preceded the tanks in defiles, such as ravines or gullies, for the purpose of attacking our antitank guns.

Section V. NOTES ON THE JAPANESE—FROM THEIR DOCUMENTS

1. INTRODUCTION

Notes on Japanese warfare, as revealed by their documents, are given in this section. The documents have been edited and paraphrased to eliminate repetition and unimportant parts. The reader must keep in mind throughout that the information presented is from enemy sources, and he must not confuse it with U. S. methods of warfare.

2. TACTICS

a. Offense

(1) *Artillery.*—Artillery support is essential for any successful attack against the enemy [U. S. troops]. They react quickly to our artillery fire; therefore, we should establish numerous artillery positions (real and dummy). By fixing fake positions, using smoke, and so forth, we confuse the opposing forces and make them waste their shells.

. . . We [Japanese] have often received effective shelling in front of the U. S. positions. And there have been instances where this shelling disorganized our ranks and finally made it impossible for use to charge.

(2) *Fire Support.*—In many cases our attacks on positions are ineffective without organized fire support. Even a night attack must have a thorough artillery preparation, and we should not hesitate to use fire-power support forces. [These "fire-power support forces" probably consist of battalion and regimental guns, quick-firing guns, mortars, and machine guns—in other words, the infantry heavy weapons. The Japanese have had a tendency to neglect the proper use of these, and to depend mainly on maneuver and "cold steel."]

(3) *Antitank.*—In regard to attacking tanks, you will jump on the tank and throw a hand grenade inside, or stab the occupants with your bayonet.

b. Defense

(1) *Against Aircraft.*—The direction from which U. S. planes approach should be watched carefully, and no one should be exposed to aerial view. If the troops carelessly bunch up, they will be bombed and strafed at every opportunity.

In woods, take advantage of shadows while moving.

Your equipment should include camouflage nets and camouflage matériel. The latter should be fastened to your uniform with string.

Opposing planes seek to locate our headquarters in order to bomb and strafe it. Therefore, its concealment is very important. Runners and orderlies must be careful lest their activities betray the position of headquarters and cause strafing by planes. Headquarters will detail an officer to direct and control all special duties.

Shortly after our landing, fierce air attacks are expected . . . The moment the attacks are over, you will construct slit trenches big enough to accommodate about five men. Until these are completed, remain under cover during daylight hours.

To afford protection against strafing as well as bombing, use the slopes of high ground and dig lateral tunnels.

Since incendiary bombs probably will be dropped, military supplies must be dispersed and important documents placed in safe places.

(2) *Against U. S. Warships.*—There will be practically no friendly warships on the sea [in this area], and opposing ships may appear in considerable force with scouting planes. Since there is great danger of a naval bombardment, those units fronting the ocean must dig strong entrenchments.

3. INTELLIGENCE

a. Procuring Information

Get information [on U. S. forces], by means of air reconnaissance, enemy broadcasts, sentries with telescopes, prisoners of war, reconnoitering of outpost lines, and so forth. Information is needed on the following matters:

(1) Enemy strength and tactics;

(2) Location of main hostile positions, types of obstacles, and the strength of flank defenses;

(3) The terrain, especially the situation of Lunga river [Guadalcanal];

(4) Location of hostile hangars, fuel dumps, and communication centers.

However, procurement of information of the area in which the division is disposed will be given the greatest consideration.

b. Security Measures

Each first-line unit, as well as the command posts of the various commanders, will have its own secret name (code).

The disposition of our strength and the condition of our supply will be kept secret from the enemy [U. S.]. Adequate precautions must be taken regarding sketches of our troop dispositions. The scattering of secret paper scraps will be stopped, and papers used by soldiers, written orders, reports, and messages will be reduced to the minimum.

4. CONDUCT OF SOLDIERS

a. Discipline

That the discipline of Japanese soldiers in some New Guinea areas was far from perfect is borne out by the following extract from a Japanese pamphlet:

During these operations, many crimes which affect military discipline have been committed. They are based on a slackness of will power and a depression in spirit.

The crimes affecting military discipline are as follows:

Robbery and rape (most frequent); trespassing on another's premises (second most frequent); disorderly conduct (generally while drunk); destruction of military equipment; desertion; trespassing on places off limits; leaving the sentry post without permission; loss of secret military documents, especially the code book.

b. Personal Sacrifices

Every noncom and every private will cooperate by sacrificing his life for the Imperial Army.

Even though you are a patient, you should not hesitate to advance. There are cases where patients exerted their utmost

energy at the time of withdrawal. Therefore, it should be possible to exert your utmost energy at the time of advance.

Educate everyone so they would rather die on the battlefield in glory than withdraw.

5. DAILY SCHEDULE

The Japanese used the following daily schedule during their occupation of Tulagi Island in May, 1942:

Daily schedule	*Hours*	*Notes*
Reveille	0400	
Morning worship begins	0415	Respectful reading of Imperial Mandate.
End of worship	0440	
Exercise	0440	
Breakfast	0500	
Begin work	0630	
Rest	0730	
Resume previous tasks	0745	
Rest	0845	
Resume previous tasks	0900	
Stop work	1000	Sick call.
Begin daily care [of equipment]	1015	
End daily care [of equipment]	1100	
Lunch	1130	
Special course begins	1430	
Special course ends	1530	
Supper	1600	
Begin work	1700	
End work	1745	
All hands get sleeping gear ready	1900	
Prepare for tour of inspection	1915	
Tour of inspection	1930	

NOTES

1. It is expected that laundry work will be done after lunch and in time not allotted to tasks or lessons.

2. Special courses shall consist chiefly of sports designed to improve standards [of health], and, at the same time, to aid the nourishment of bright clear feelings.

Section VI. MISCELLANEOUS

1. INTRODUCTION

The following short reports by U. S. observers cover a number of unrelated topics and are grouped in this section for purposes of convenience.

2. EQUIPMENT

a. Bangalore Torpedo

The Japanese Bangalore torpedo (used at Milne Bay) consists of a split bamboo pole (with the parts held in place by several wrappings of cord) explosive charges, a primer cord, a fuze, and a detonator. Five to seven charges, depending on the length of the pole, are placed in the hollow spaces of the pole and connected by means of a primer cord. At one end of the cord is a short length of fuze, which is attached to a detonator. The use of the detonator causes the charges to explode almost instantaneously. The torpedo is operated by igniting a short length of safety fuze, which is attached to the detonator.

Each of the charges consists of a cylindrical cake, 6 inches long and 3 inches in diameter, and composed of Japanese Model 88 explosive wrapped in paper. The explosive has the appearance of finely ground thermite, and has an oily feeling. An analysis of a sample charge proved its composition to be as follows:

	Percent
(1) Ammonium perchlorate (NH4CLO4), a mild explosive with about the same sensitivity to detonation as picric acid	75.5
(2) Silicon carbide (*sic*), which is not commonly found in explosive; it was probably added as a gritty substance to increase sensitivity to detonation	14.6
(3) Wood pulp	5.9
(4) Oil-binder	3.9

b. Antimosquito Cream

The Japanese soldier usually carries a glass tube of antimosquito cream in his first-aid kit. The tube is 3 inches long and 7/8 inch in diameter, and has a cork stopper. The cream itself is in the form of a soft, green, and wax-like stick, which has an odor similar to oil of citronella.

A paper label on the tube gave the following directions for use:

"Mosquito cream—spread the preparation over the exposed skin, particularly when out of doors at night. After use, always put the cork back in the tube."

c. Blotting Paper

This paper, found on Japanese soldiers, is somewhat like an ordinary blotter, except that it is heavier and more absorbent. The paper, 4¾ inches long and 2⅜ inches wide, is apparently used to remove liquid vesicants (chemicals that cause blistering) from the skin.

The reaction of the blotter to various tests gave no evidence that it might be an indicator paper. It was tested with various blister gases but gave no reaction or color change.

3. JUNGLE-CLEARING UNITS

On Guadalcanal, the Japanese employed well-equipped and organized units for cutting paths and removing obstacles so that routes could be established for troop movements. One such outfit, known as the Clearing Unit or Terrain Obstruction Unit, reconnoitered the terrain of proposed routes and planned the work.

This type of unit was a component part of the Guiding Unit, which included an 8-man Covering Squad, a 10-man Route Squad, a 10-man Course Squad, a 5-man Siting Detachment, a 10-man Reserve Squad, and a Command Unit (with a medical man attached).

The equipment of these units included the following: compasses, protractors, course instruments, whetstones, lighting apparatus, sickles, axes, hatchets, oil cans, pole-climbers, sketching board, and marking materials.

4. REGARDING SECURITY

a. Seeking Documents and Equipment

In searching for hidden Japanese documents and equipment, the following is a list of places where they may be found:

(1) In the thatching of hut roofs, and under dirt which has been thrown on roofs;

(2) Under floor boards of huts and dugouts, and in holes dug under the boards;

(3) In bedding, including grass and mat beds;

(4) In weapon pits, in false graves, and in real graves;

(5) Under logs (generally in holes dug and then filled before the logs are rolled back in place);

(6) In log roofs of dugouts, and in boxes used as cross-members of pillboxes (the documents often may be on the bottom of the boxes, which are completely full of dirt);

(7) Behind blankets tacked on walls of huts and dugouts;

(8) In the steel helmets of soldiers; and

(9) In garbage dumps.

b. Identification Disks

These are worn in a variety of places, for example: On the wrist, around the neck or waist, attached to the outside or the inside of loin cloths, in hats, in haversacks, and in purses. Not all Japanese carry disks. Some of the disks observed were defaced and some were blank.

Section I. NOTES ON LIGHT AA (NEW ZEALAND)

1. INTRODUCTION

The following notes on light antiaircraft have been extracted from a New Zealand Army Training Memorandum, prepared by a field officer with a New Zealand Force operating against the Japanese in New Guinea. American forces fighting on similar terrain, and against the same enemy, will be especially interested in his suggestions.

2. THE LIGHT AA LAYOUT

a. Your layout will depend on the topography of the area to be defended. Don't decide on your layout until you have made your reconnaissance. If you neglect to follow this rule, you will always be disappointed in the results.

b. Don't try to make a symmetrical layout. Place all guns so that the volume of fire is where you want it.

c. In hilly country don't place all the guns above the target area. If you do, aircraft at low altitudes will be difficult to

engage, and your gun pits will be in constant danger from your own fire.

d. Hilly country gives ideal protection for director control, inasmuch as most guns are emplaced in hillsides, and protection of the guns' dead arc is insured. But the difficulty of sighting in time is a great disadvantage.

e. Never place guns too near the vulnerable point. Depth in layout is essential. If possible, place guns 800 yards from the vulnerable point. If this can be done, fast low-flying targets can be engaged effectively, and your equipment will be less vulnerable to pattern bombing.

f. When high-level pattern bombing and fast low-flying attacks are to be expected, it is believed that the conventional distance of 400 yards between guns is neither practical nor desirable.

g. Another reason why 800 yards has proved the ideal distance from the vulnerable point is that tracer does not show up for the first 400 yards. If the guns are too close, the layers can't observe the tracer.

h. If you are closer to the vulnerable point, low-flying attacks flash in at maximum speed. They are too fast to engage, because the layers cannot traverse fast enough. This can be countered by pushing the guns back and giving depth of layout.

i. Cover all avenues of approach. Once a plane comes in and commences to strafe, the enemy pilot is watching his own tracer and seldom veers off. But in every case in which our fire tackled him before he started his run, he didn't have the guts to come through. This was an important lesson and led us to alter our layout.

j. Don't believe that the Jap is a suicide merchant. He hasn't demonstrated it here.

k. If possible, establish the command post at a point from which all battery positions can be seen, but far enough from the vulnerable point to avoid unnecessary risk.

l. Telephone communication to every gun is absolutely essential.

m. A scheme of night barrage should be thought out. Flash will definitely blind the layer at the forward area sight. Director should be able to lay continuously on an illuminated target. However, a night barrage scheme to suit the layout is recommended.

3. CAMOUFLAGE AND CONCEALMENT

a. Although we have paid every possible attention to camouflage and have achieved excellent results, we have given first priority to protection whenever protection and camouflage have clashed.

b. To date, we have not found a quick-release net that we have liked well enough to adopt, and we have tried most varieties. Our chief objection to them is that during an alert the guns must be ready to open fire at an instant's notice. Also, the movement of a quick-release net betrays the gun position.

c. The rule that we have followed thus far has been to conceal the position entirely until the first engagement, and this has been successful. From then on speed and accuracy are everything. The enemy knows you are there, and will try to flash through, relying on his speed. Under these circumstances nets are a hindrance.

d. A track plan for vehicles and personnel must be controlled from the start. Study of aerial photographs here convinces us of this. High grass shows every track.

e. Dummy positions require constant attention. Look out for the lazy chap who is fond of borrowing sandbags from the dummy positions.

f. In the beginning, one of our pits was attacked and strafed from two directions simultaneously. Our men had made no attempt at concealment. But as soon as a single man had been

hit, they learned their lesson. They moved to a bomb crater, then to a gravel pit, and then to a group of cactus. In every one of these positions they were well concealed.

g. Men without shirts are more conspicuous than men with shirts.

h. The parapet of a bomb crater blends easily if each bag is smeared with mud. It may seem like a long job, but it's definitely worthwhile.

i. Keep the garnish on your nets in first-rate condition.

j. When your living quarters are nearby, they will always give away your gun position. The answer is dispersion. You have two guardian angels. Camouflage is one, dispersion is the other. It is hard to tell which is the greater saver of lives and equipment.

k. If you can possibly arrange to do so, go up and view your positions from the air.

4. IDENTIFICATION AND WARNING

a. Contrary to expectations, no difficulty has been experienced in identification.

b. On one occasion a Kittyhawk dived through thick oil smoke (just after a heavy bombing) with three Zeros on his tail, and was fired upon. He came to the gun later and apologized, explaining, "It was entirely my fault. Believe me, I was a lot more nervous about the tracer coming up to meet me than I was about those Zeros. But I was going too fast to get into reverse."

c. We can't always rely entirely on plane markings or types. In this particular area, the Japs have not yet resorted to their trick of coming in with landing lights on; nevertheless, we don't intend to be caught napping.

d. The secret of identification is in having an intelligent spotter on every gun. His tour of duty is only half an hour. He must be on the job all the time and must realize how terrific

his responsibility is. The only thing he can expect is the unexpected.

e. Planes at high altitudes are always suspect.

f. Don't expect warnings of a strafing raid. It may be all over before you receive them. The spotter should always play safe. Unless he is certain, "Take post" should be given.

g. Duty detachments should be within 5 seconds of the gun. Generally the warning is good. But we can't rely on it.

h. Watch out for the surprise fighter attack after the bombing raid, or after the "all clear." It amuses the Japanese; but an alert spotter spoils the joke.

Section II. BRITISH ARMY NOTES ON EMBARKATION SECURITY

The British have learned their embarkation security lessons from experience; consequently their opinions on this subject are not only informed, but should prove of immediate interest and value to American troops. The following is a condensation of a British Army training memorandum:

Troops under orders to proceed overseas must be made to understand why secrecy is essential, and that everyone of them possesses information which, in the hands of the enemy, might cost their own lives, the lives of thousands of their comrades, and the success of a major military operation.

Vital matters which must be kept secret from everyone whose official duty does not require the information are:

a. Port of embarkation.

b. Name of ship, or of other ships in the convoy.

c. Date or time of sailing.

d. Destination or route of convoy.

e. Any particulars concerning His Majesty's Forces or the types and quantities of matériel embarked.

It is equally important not to talk to anyone about these subjects if your information is based only on guesswork. The guess may be right.

The fact that a unit is shortly to proceed overseas must necessarily be known to certain people during the preparatory period. Nevertheless, the fewer people who know, the better. And the less they know, the less the enemy is likely to find out.

Perhaps you suppose that the little you have to tell cannot be important. If you believe this, you are wrong. As a rule, the enemy discovers vital information only by piecing together several small items of intelligence, like a jigsaw puzzle. It may be that your little fact gives sorely needed verification. It may well be that the movement of your unit is part of a large-scale operational movement, which could fail entirely as a result of your breach of security.

Although everyone knows that classified information about the movements of troops and convoys must not be discussed in a public place (or even over the telephone), not everyone realizes that it is just as dangerous to pass this information along to relatives and lifelong friends. No doubt you are sure that they will not tell anyone, since you asked them not to. But YOU were instructed not to tell anyone, and you have already done so. They may follow your example. After all, they are not in as immediate physical danger as you are.

"Bowels open, mouth shut" is a very good motto to observe, not only in the Army, but throughout life.

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