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SECTION I

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AIR

1. ITALIAN FIGHTER PLANES

a. Macchi-202

The Macchi-202, one of the best Italian fighters, is a single-seat, low-wing cantilever monoplane, powered by one, twelve-cylinder, Daimler-Benz 601 A/1 engine of the inverted "V" liquid-cooled type. It is of all-metal construction with smooth stressed skin and has moderately tapered wings with a span of 34 feet 8 inches and a gross area of 181 square feet. The fuselage is oval, with the cockpit over the trailing edge of the wing. Camber-changing flaps are interconnected with the ailerons. It has an adjustable stabilizer and a hydraulically operated landing gear retracting inward into the wings. The tail wheel is fixed.

The latest type of engine is reported to develop 1,150 hp at 16,000 feet, which would permit a sea-level speed of 295 mph, a cruising speed of 310 mph at 18,000, and a maximum speed of 360 mph at 20,000. The airplane is believed capable of reaching an altitude of 18,000 feet in approximately 7.2 minutes.

The service ceiling with a normal load is 35,000 feet, and the range is 425 miles at normal cruising speed. On some models the engine is fitted with an air filter connected to the landing gear. The filter apparently operates only when the wheels are down. The metal propeller is three-bladed.

There are apparently two fuel tanks, one in the fuselage below the pilot's seat, holding 71 U.S. gallons, and the other behind his head and shoulders with a capacity of 34 U.S. gallons. Both tanks are of standard light-alloy construction and are self-sealing, having five protective layers on the inside. However, a recent airplane is reported to have had three tanks, a main tank aft of the cockpit holding 111 U.S. gallons and an auxiliary tank of 25 U.S. gallons built into each wing next to the fuselage, each connected with the main tank.

The standard armament consists of two synchronized 12.7-mm Breda machine guns mounted over the engine and firing through the propeller. There is provision for mounting two 7.7-mm guns in the wings outboard of the propeller arc, but none have been found actually installed. This aircraft is believed to be equipped to carry two 220-pound bombs.

Eight-millimeter armor protection is used for the head, shoulders, and bucket seat, but no bulletproof windshields have been reported.

This airplane has been almost entirely used for fighting and ground attack. It has operated extensively against Malta, and in the defense of the North African ports in the Libyan campaigns, and is now in action in Tunisia.

b. Reggiane-2001

The Reggiane-2001 is another Italian fighter used for ground attack. It is a single-seat, low-wing, cantilever monoplane with a comparatively short, tapered fuselage. The elliptical wings have more curvature on the trailing edges

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than the leading edges, and rounded tips. The single fin and rudder have a very deep chord and are approximately triangular in shape. The leading edge of the fin is straight, and the trailing edge of the rudder is slightly curved. Split flaps are fitted and are continuous under the fuselage. The main wheels of the landing gear turn through 90 degrees during retraction and appear as slight bulges beneath the wing. The tail wheel is non-retractable. The cockpit is inclosed and is over the wing.

The airplane is powered with a Daimler-Benz 601A/1 engine, as used in the Macchi-202, which develops 1,150 hp at 16,000 feet. This is believed to give a sea-level speed of 290 mph, a cruising speed of 300 mph at 18,000 feet, and a maximum speed of 350 mph at 20,000 feet. The airplane can climb to 18,000 feet in slightly over 8 minutes. Service ceiling with normal load is 34,000 feet, and the range is 730 miles at normal cruising speed. There is a coolant radiator with controllable flaps under each wing and an oil cooler mounted beneath the engine. A standard type of air cleaner is incorporated forward of the long intake to the supercharger. The three-bladed propeller is reported to be made of solid duralumin.

It is believed that the aircraft was originally designed to carry one fuel tank in the center section with a capacity of 172 U.S. gallons. However, at least one is reported to have three tanks, one behind the pilot's seat of 22 U.S. gallons capacity. The other two tanks are at right angles to the fuselage, extending 2 1/2 feet into each wing; the forward one holds 82 U.S. gallons, and the other 54 U.S. gallons.

A flat pane of splinter-proof glass forms the windshield of the cockpit. Behind the pane is a sliding canopy of plexiglass which can be slid to the rear, permitting exit by parachute, or can be fixed in intermediate positions.

The basic armament of the Reggiane-2001 consists of two 12.7-mm synchronized Breda machine guns, fitted beneath the top cowling with the breeches accessible to the pilot and firing through blast channels; also, two 7.7 guns, one in each wing. The original design is believed to permit the installation of a carrier for light bombs or a container for antipersonnel bombs. Another report suggests a version of this airplane (Re-2005) fitted for carrying one or two small torpedoes and equipped with the 1,500 hp Isotta Fraschini L 180 I.R.C.C. 45 engine, which would give a performance comparable to the Re-2001 fighter.

The pilot's bucket seat and his head and shoulders are protected by 7-mm and 9-mm armor plate respectively.

This airplane has been reported in action on the Tunisian front.

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ANTI-AIRCRAFT

2. FLAK DIRECTIONAL ARROWS TO GUIDE GERMAN FIGHTER PLANES

a. General

When Allied aircraft approach behind cloud layers or out of reach of anti-aircraft batteries, the Germans have perfected a method of "skywriting" a red arrow of bursting shells to point out their approximate direction and height to German interceptors. Red flak bursts have been frequently reported by pilots, unaware of its purpose, who were flying over occupied territories by day. The German instructions for firing this type of indicator have recently come to hand.

Although such a pattern itself has not been reported by pilots, red marker-projectiles are fired to form an arrow measuring 3,500 to 3,850 yards long. The "shaft" consists of four or five bursts spaced at about 700 yards, while six bursts form the "point." The arrow is almost horizontal, aligned on a bearing from the gun position to the approaching aircraft, and at approximately their height. (This may explain why the pattern has not been reported.) The arrow can be formed in from 5 to 15 seconds, and in calm weather lasts 3 or 4 minutes. Red practice ammunition is usually fired, but HE is used when other ammunition is not available.

b. Instructions for Firing Directional Arrows

(1) Instructions for Firing

Flak directional arrows are only fired if friendly fighters are aloft or in readiness, and if no hostile aircraft are in range of the gun position or likely to come into range shortly.

In accordance with a directive, flak directional arrows are also to be fired if hostile aircraft, flying above the clouds by day, can only be picked up by directional indicators, and are out of range of the flak. If friendly fighters are above cloud, the flak directional arrow must be fired at the height of the hostile aircraft. If these same fighters are below cloud, the flak directional arrow must be fired close beneath the cloud base.

(2) Firing Data

The height of the enemy aircraft is taken to the nearest 1,000 meters (approximately 3,000 feet), and a future bearing is obtained.

Two salvos each are first fired by three guns to form the "point" of the arrow, and then five (or, as the case may be, four) rounds by the fourth gun to form the "shaft."

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(3) Procedure for Firing

(a) Preliminaries

At each gun, a table of quadrant elevation and fuze data must be provided for gun crew members numbers 1 and 6 (see table). Instead of tables, the data can be shown on the guns as follows: for No. 1, colored marks on the elevation scale, with corresponding height figures; for No. 6, data, in accordance with the table, painted on the left-hand side of the mounting.

Firing of flak directional arrows must be preceded by explanation and practice.

(b) Firing Drill

(1) The executive officer designates a primary gun for firing the "shaft." Taking the line from the gun position to the hostile aircraft, the firing of the "shaft" should be allotted to one of the center guns. As already stated, this gun has no part in firing the "point."

(2) Height and bearing are taken and called out. The executive officer takes height to the nearest 1,000 meters and calls it to the gun detachment commanders. He adds lateral deflection to the bearing; it should be about 350 to 400 mils. Future bearing is passed by the executive officer to the gun detachment commanders.

(c) Example of Order

"Take post - aircraft 8 o'clock - flak directional arrow - height 4,000 (i.e., meters--14,500 ft) - primary gun "A" - bearing 6,300 (i.e., mils = approx. 354°) - fire."

No. 1 sets quadrant elevation for the height ordered (from his table) on the elevation scale. He reports, "No. 1 set." No. 2 sets the bearing ordered and reports, "No. 2 set."

With the 88-mm gun, models 18/36 and 37, No. 6 sets fuze for the height ordered (from his table) on the fuze-setting machine. When the fuze is set, the round is loaded at once. No. 3 fires on the order of the gun detachment commander.

With the 105-mm gun, models 38 and 39, fuzes for the height ordered (from the table) are set by means of two fuze-setting keys. No. 3 loads the first round on the order of the gun detachment commander.

Before firing the first salvo, the gun detachment commanders report "ready" to the executive officer after the required data have been set. The executive officer then gives the order "fire." Subsequent salvos, after the appropriate data are set, are fired as quickly as possible without further orders.

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With the 88-mm (18/36 and 37), rounds must be fired at intervals of 2 seconds, and with the 105-mm (38 and 39), at intervals of 2.5 seconds. Firing must be in the following order: 1st and 2nd salvos from three guns for the "point," followed by five or four rounds from the primary gun for the "shaft."

(d) Cease Firing

This is ordered by the executive officer as soon as he sees that friendly fighters have recognized the hostile aircraft, or if hostile aircraft come into range. The appropriate order is: "Cease firing flak directional arrow." If this order is not given, firing of the arrow is repeated.

c. Firing Data Tables

(1) Tables for 88-mm Antiaircraft Gun (18/36 and 37)

(a) Table for No. 6 (Fuze-Setting in Units from the Cross)*

Height	1,000 m	2,000 m	3,000 m	4,000 m	5,000-8,000 m
Arrow Point (1st and 2nd salvos)	180	230	290	330	340
Primary gun					
1st round	155	205	265	305	315
2nd round	130	180	240	280	290
3rd round	110	160	220	260	270
4th round	85	135	195	235	245
5th round	60	110	170	210	220

(b) Table for No. 1 (Quadrant Elevation)

Height	Height
1,000 m = 15°	5,000 m = 43°
2,000 m = 23°	6,000 m = 50°
3,000 m = 30°	7,000 m = 55°
4,000 m = 37°	8,000 m = 60°

*Fuze-lengths are measured in degrees from a cross or zero mark; e.g., on the fuze-setting key. The German fuze scale reads from 0 to 350, the numerals being reference numbers which indicate definite times of flight.

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(2) Tables for 105-mm Antiaircraft Gun, 38 and 39

(a) Table for No. 6 (Fuze-Setting in Units from the Cross)

Height	1,000 m	2,000 m	3,000 m	4,000 m	5,000-8,000 m
Arrow Point (1st and 2nd salvos)	200	240	280	300	340
Primary gun:					
1st round	175	215	255	275	315
2nd round	150	190	230	250	290
3rd round	105	145	180	205	245
4th round	80	120	160	180	220

(b) Table for No. 1 (Quadrant Elevation)

Height	Height
1,000 m = 15°	5,000 m = 38°
2,000 m = 20°	6,000 m = 43°
3,000 m = 25°	7,000 m = 48°
4,000 m = 32°	8,000 m = 53°

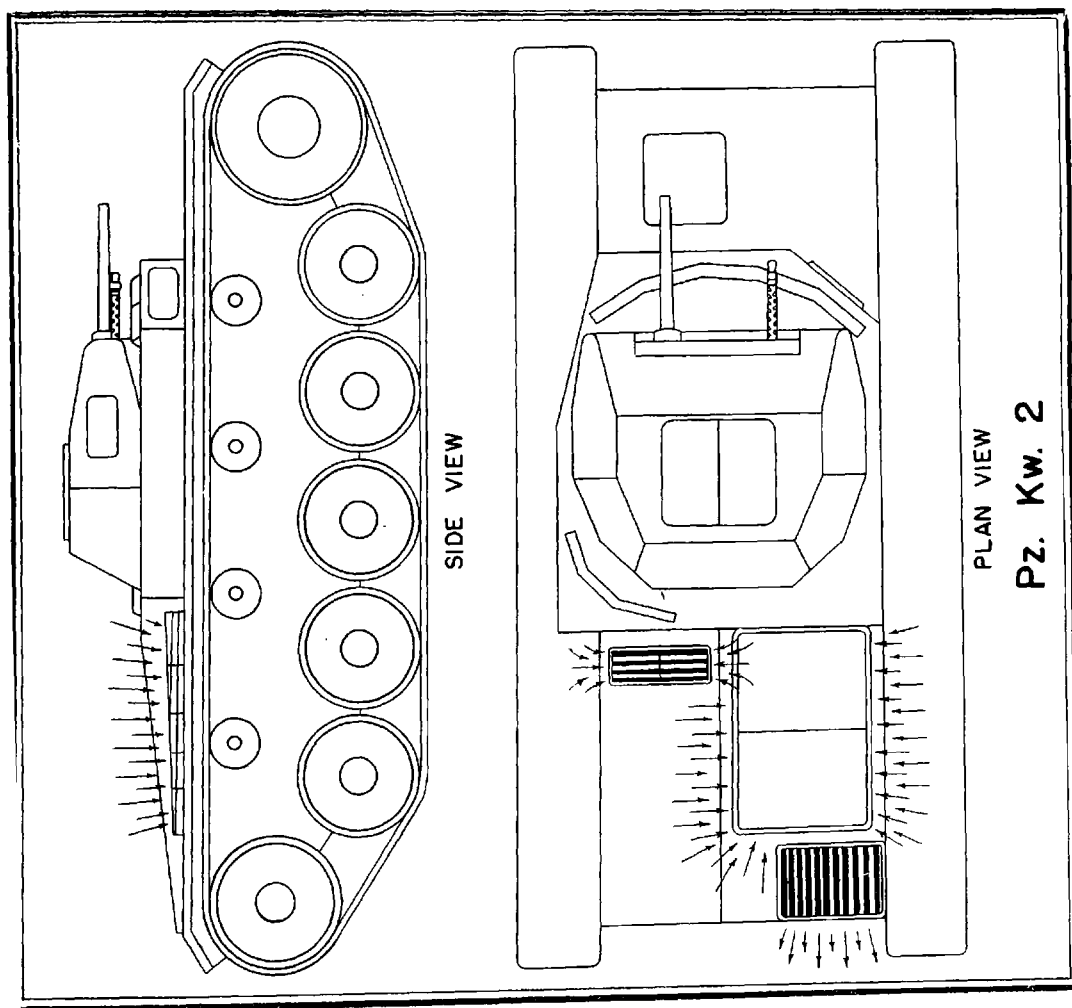
ANTITANK

3. GERMAN 75-MM ANTITANK GUN

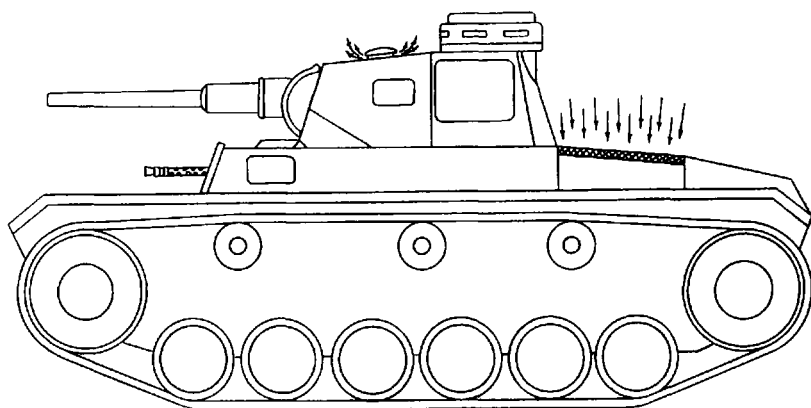
In case any of the 75-mm Pak 97/38 guns fall into the hands of our artillery, it should be a fairly familiar weapon. The gun is a long-barreled adaptation of the French "75" with some interesting modernizations. Noteworthy are the double shield with an air space between the two plates, the perforated Solothurn muzzle brake, the odd-looking split trail, which would seem to give a large and rapid traverse, and the third smaller wheel set under the trail spades. This third wheel can be folded up flat on top of the trail. The carriage is quite similar to the 50-mm German antitank gun. With a screw breech-block like the old "75," the piece is typically French. An earlier type of French 75-mm dual-purpose antitank-field piece, said to fire a 14.1-pound solid shot at 2,100 f/s velocity, was completed in March 1940. The present weapon appears to be a development of this gun.

4. VULNERABLE SPOTS FOR INCENDIARY GRENADES ON GERMAN TANKS

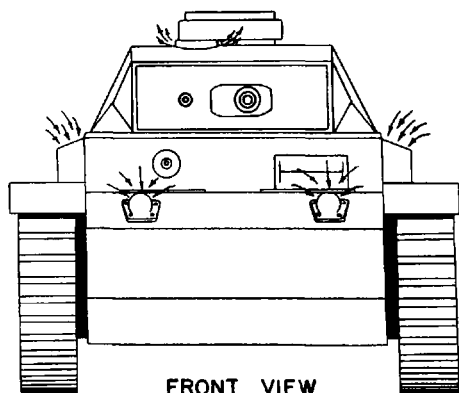
In attacking enemy tanks at close quarters with Molotov cocktails or incendiaries, the air intakes are among the most vulnerable points. It is important, therefore, that the location of these intakes and outlets be known, as the flame and fumes of a grenade thrown against an intake while the engine is running will be sucked inside, but if the grenade lands on an outlet, they will be blown clear of the tank.



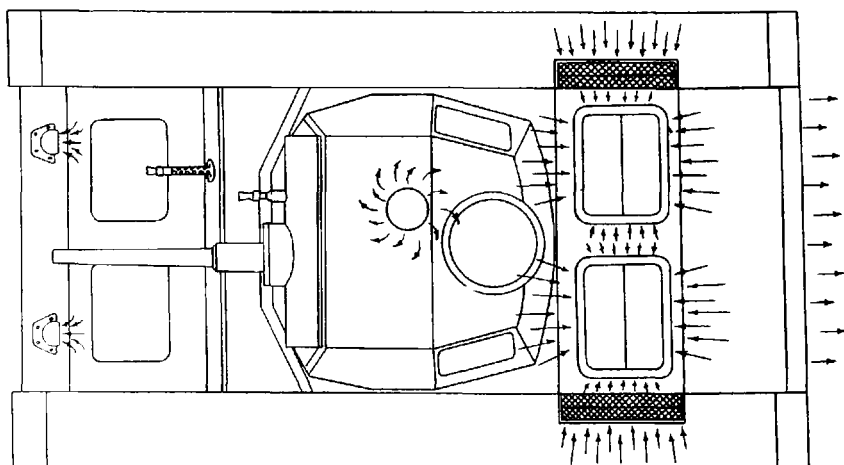
The best targets are the flat top-plates behind the turret. Side intakes are invariably protected by a vertical baffle. The accompanying sketches show the "soft spots" in German tanks Pz.Kw. 2, 3, and 4.



SIDE VIEW

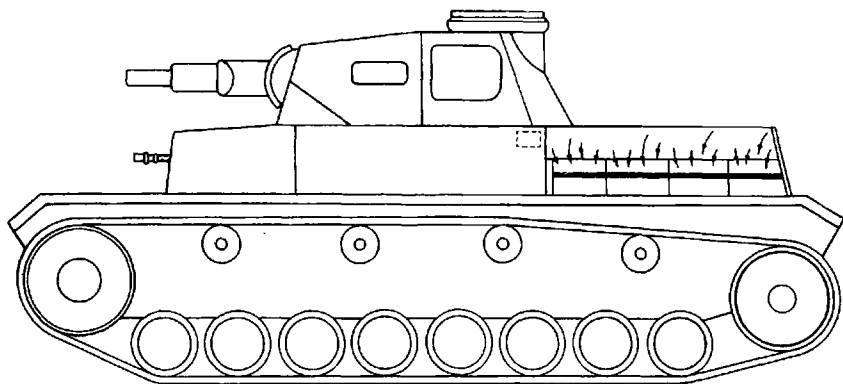


FRONT VIEW

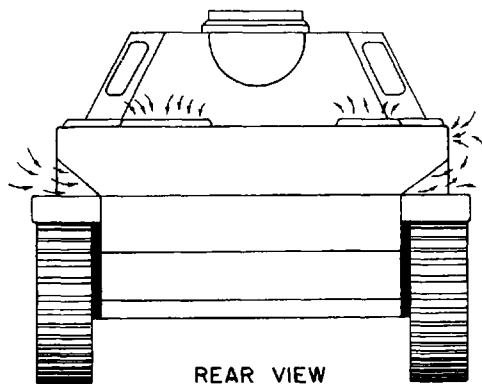


PLAN VIEW

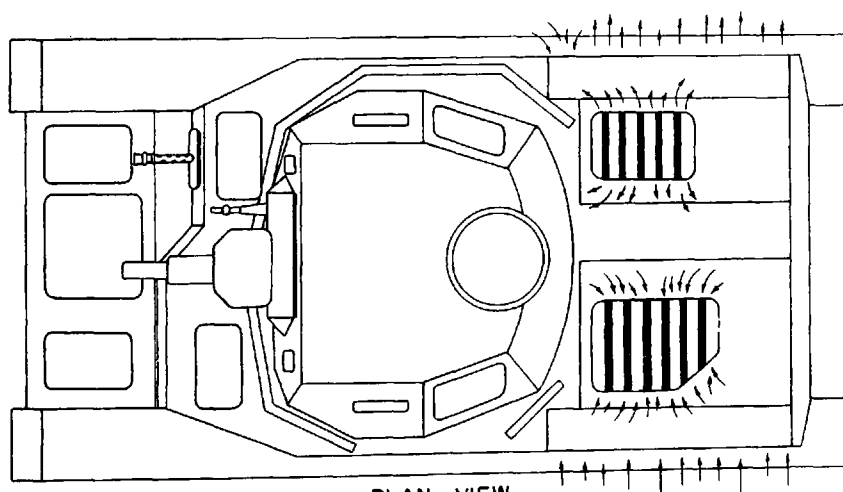
Pz. Kw. 3



SIDE VIEW



REAR VIEW



PLAN VIEW

Pz. Kw. 4

5. GERMAN ANTITANK UNITS IN REARGUARD ACTION IN AFRICA

According to reliable reports, the tactical use of antitank weapons by German units operating on rearguard missions, is as follows: First, the 88-mm dual-purpose guns fall back, then the combat engineers, and the antitank guns last. Unless the attack is too overpowering, the antitank units, before withdrawing, stand fast for a length of time designated in orders. If the gun positions are undetected, antitank fire is opened only at the last possible moment, since the German 50-mm guns are not effective against General Grant (U.S. M3) and General Sherman (U.S. M4) tanks at long ranges. If the gun positions are known to the enemy, long-range fire is employed.

ARMORED FORCE

6. OBSERVATIONS ON GERMAN EMPLOYMENT OF ARMORED INFANTRY

The following account of the tactics of armored infantry was taken from a German training manual.

a. General

(1) Tasks

The rifle company transported in armored vehicles is a particularly strong unit in the attack because of its mobility, high fire power, and armor protection. The latter makes it possible to fight from the vehicles, but this is very rarely done. These units habitually dismount and fight on foot. The armor protection permits them to approach the enemy closely before dismounting. In view of its high allotment of heavy weapons, the company is able to carry out independent tasks.

Its main role is cooperation with tank units in carrying out the following tasks:

- (a) Quick mopping-up and consolidation of ground overrun by the tanks;
- (b) Supporting the tank attack by overcoming nests of enemy resistance, removing obstacles, and forming bridgeheads;
- (c) Protection of assembly and bivouac areas.

b. Training

(1) Thorough training in fighting on foot must be given; at night, in all sorts of weather and all seasons, and over diversified terrain.

(2) All types of firing, especially at snap targets, must be practiced with both rifles and automatic arms, while the armored carrier is stationary and while it is in motion.

c. Fighting as Assault Troops

When the unit is used as assault troops, and also when fighting in woods, the weapons carried by the squads should be mostly submachine guns with plenty of HE and smoke grenades. Often only one machine gun will accompany the squad, but much extra ammunition will be distributed among several riflemen. The assault squads can borrow submachine guns from the other squads. The heavy machine guns may go into action without their heavy mounts, but the mount should always be available. Mortars, from the vicinity of the carrier, coordinate their fire with that of the heavy machine guns.

d. The March

Over favorable terrain, an average speed of 15 mph can be maintained, with a maximum speed of from 18 1/2 to 22 1/2 mph under favorable conditions. This would permit a total of 90 to 120 miles per day. The interval between the point section and point platoon is about a minute, and between the point platoon and the company, 2 minutes. Antitank weapons, if carried, should be placed well forward, but other heavy weapons are normally placed in the rear. The company commander, and the commanders and observers of the artillery and heavy weapon units, usually travel behind the point platoon. Each platoon provides its own flank guards. Every 2 hours, a 20-minute halt should be made for minor repairs and refueling.

e. Fighting from the Carrier

The chief weapon in fighting from the carrier is the fixed (light) machine gun. Generally, this will be fired during halts of 15 to 25 seconds.

f. Attack in Cooperation with Tanks

The company will usually follow close behind the tanks to mop up points of resistance the tanks have by-passed. The leading troops will not dismount from their carrier, but will leave the fighting on foot to the succeeding waves. Antitank guns, if allotted, protect the flanks. Close contact will be maintained with the tanks ahead.

g. Pursuit

Close pursuit will be maintained, with every effort made to get behind and cut off the enemy, but when doing this, care must be taken to avoid being flanked in turn.

h. Defense

In defense, the armored infantry provides the outguard.

i. Retreat

Against an enemy on foot, withdrawal is made under cover of the armored infantry, which launches delaying counterattacks. Against an armored force, strong antitank fire must be provided, with constant reconnaissance on the flanks.

j. Battle under Special Conditions

(1) Attacking Strong Prepared Positions

The first two of the four carriers of an assault platoon drive forward through gaps in the minefields under cover of fire from the heavy weapons, directed at the casemates. They take position at the rear of the enemy defense areas. Against enemy tanks, smoke is used.

In the third carrier is the assault platoon leader, with squads detailed to hack through or blow out a lane in the wire. The fourth carrier, at 100 to 200 yards distance, follows up with ammunition and equipment.

(2) Fighting for Rivers

A swift attack to cut fuse connections will often prevent the enemy from blowing up bridges. If resistance is encountered, the patrols must report to the commanding officer, who may decide to cross elsewhere by means of rubber boats, or otherwise. Diversions should be practiced to draw the enemy away from the place of actual crossing. As soon as a crossing is made, the armored infantry will protect the bridgehead. Care must be used to prevent the dispersion of forces, and until a bridge is built, personnel carriers remain under cover from possible artillery fire.

(3) Fighting in Darkness or Fog

Careful preparation is necessary. In order to maintain direction the attack is usually made on foot along the lines of roads, streams, or ridges. Every effort is made to keep the carriers well forward, but under cover, in case the fog lifts or daybreak comes.

(4) Fighting in Towns or Villages

As a rule, occupied towns are avoided. If necessary to attack them, setting fire to buildings will assist in making a breach in the defenses, and the attack is then pushed through courtyards and gardens rather than along streets.

(5) Fighting in Woods

Careful preparation and planning should be done when time permits. Where possible, the woods are split into sectors and cleared in detail. The thicker the woods, the closer must be the formations. Before crossing open spaces, close observation must be carried out. Cunning and surprise are often more profitable than prepared assault. At nightfall, the attack is broken off and the defense organized.

On the defensive, the position should be organized in depth well inside the edge of the woods. Trails are cleared and marked for rapid communication within the position. Listening posts near the edge of the woods keep the open country under observation; they are frequently relieved.

7. AMMUNITION CARRIED BY GERMAN TANKS

Two captured German tanks (Pz.Kw. 3's) were recently examined in the Middle Eastern theater. The number of rounds carried for the 50-mm (1.97-in) guns was as follows:

	HE	AP	TOTAL
Tank 1	80 (45%)	98 (55%)	178
Tank 2	51 (32%)	111 (68%)	162

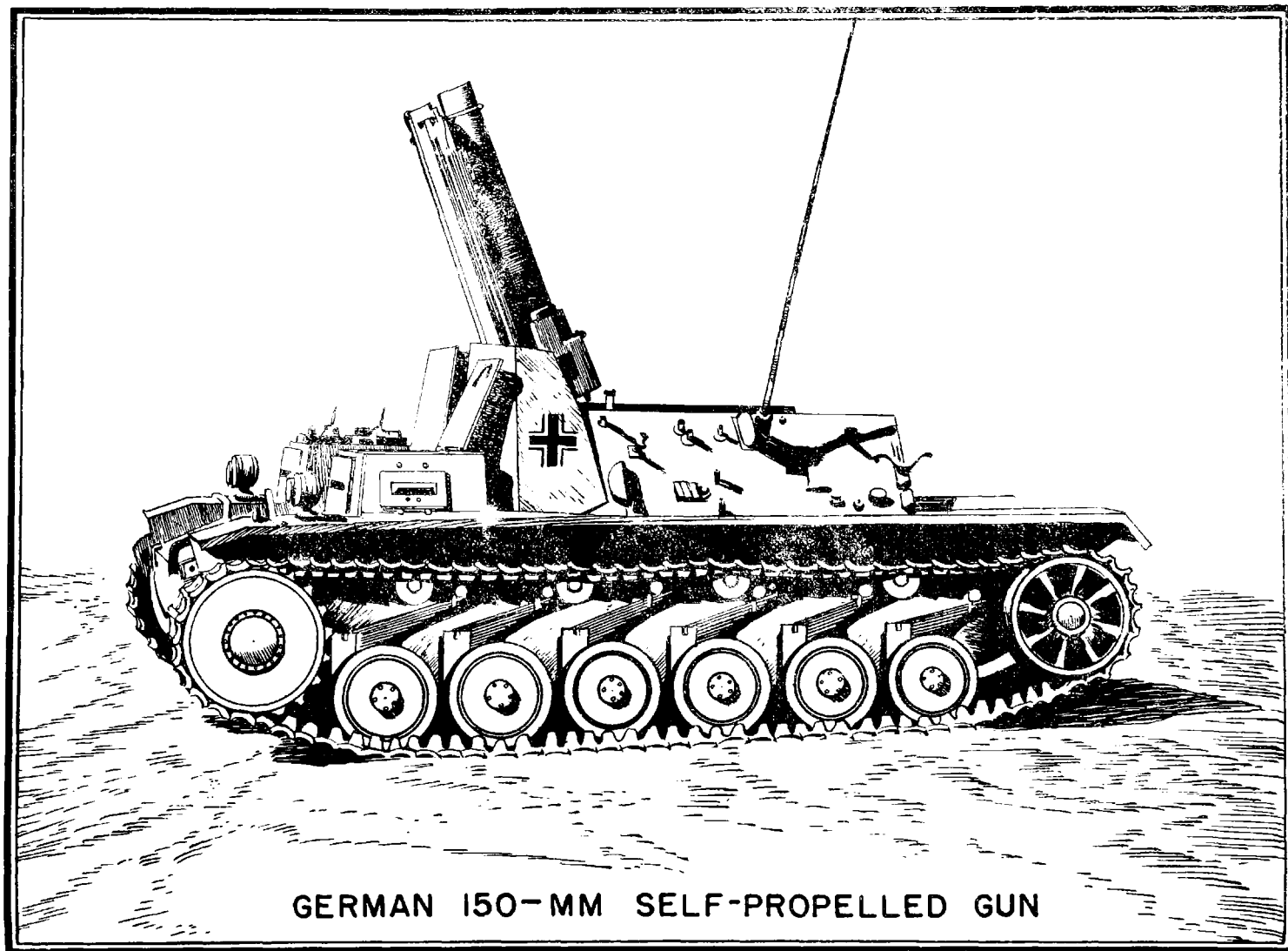
Of these, 86 rounds were carried loose on the floor of Tank 1, and 83 in Tank 2. In the bins of the first tank were 92 rounds, and there was room for 7 additional rounds; in the bins of the second were 79 rounds with room for 17 more. This indicates a total stock of some 185 and 179 rounds per tank, respectively.

ARTILLERY

8. GERMAN 150-MM SELF-PROPELLED GUN

The Germans have at least three types of 150-mm self-propelled guns. One is mounted on the chassis of a German Pz.Kw. 1 and has a high three-sided shield. Another is mounted on a French tracked-chassis (see Tactical and Technical Trends, No. 12, p. 15). The third type has already been described in some detail in Tactical and Technical Trends (No. 8, p. 28, and No. 13, p. 6). Photographs of the latter are now available and are the basis of the accompanying sketch.

The sketch shows that the gun is mounted on what is apparently an adaptation of a German Pz.Kw. 2 chassis; the standard Pz.Kw. 2 chassis has 5 bogie wheels, whereas the mount for this 150-mm gun has 6 bogie wheels.



GERMAN 150-MM SELF-PROPELLED GUN

Otherwise the mount appears similar to the usual Pz.Kw. 2 chassis. It was previously reported that the maximum elevation for this weapon was 30 degrees; in the sketch the gun is elevated to an angle of about 70 degrees, but whether it can be fired from this position is not known. Presumably, radio communication is installed, as there is a rod-type aerial on the left hand side of the super-structure.

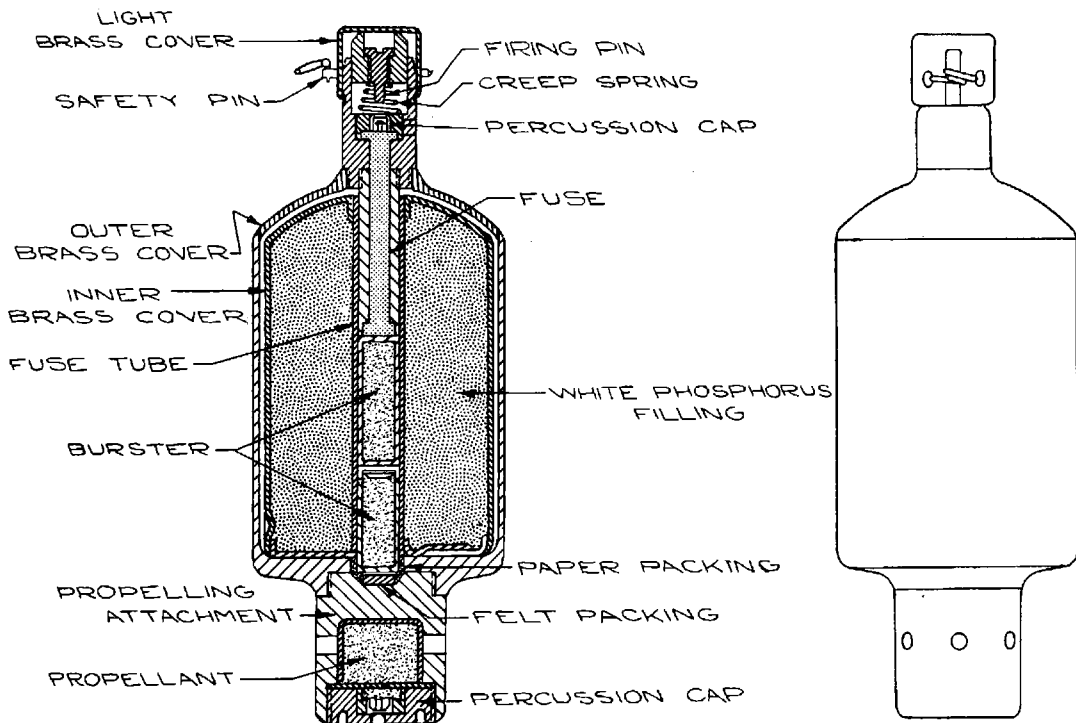
CHEMICAL WARFARE

9. THREE JAPANESE INCENDIARIES*

Aside from incendiary bombs, the Japanese are reported to have at least two types of incendiary grenades and at least one type of incendiary mortar shell. For general information on Axis incendiary munitions, see Tactical and Technical Trends, No. 14, p. 12.

a. Half-kilogram Incendiary Grenade

This grenade, 50-mm in diameter, approximately 5.3 inches in length, and



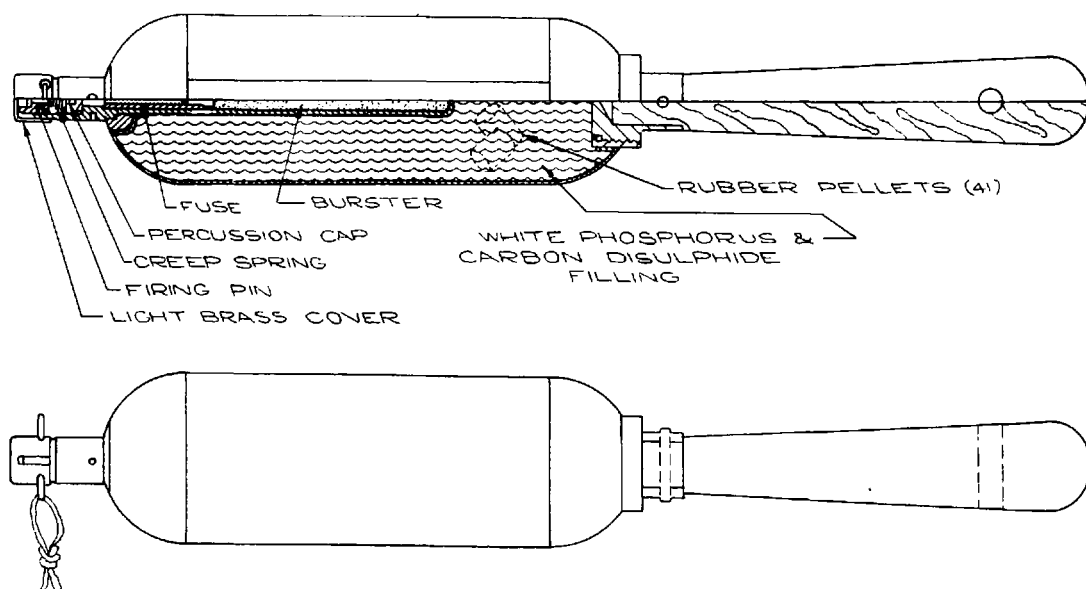
*Based on a Chemical Warfare Intelligence Bulletin, Office of the Chief, Chemical Warfare Service.

weighing 1.1 pounds, may be thrown by hand or projected with a heavy grenade discharger, sometimes mistakenly called a "knee mortar." The incendiary filling (white phosphorus) is contained in a brass body. An attachment consisting of a propellant and a percussion cap is screwed into the base of the grenade for projection with the grenade discharger. When thrown by hand, this attachment is removed. Before use, the safety pin is withdrawn. The safety pin serves the double purpose of holding a light brass cover in place and of preventing downward movement of the firing pin onto the percussion cap. The firing pin is then held off the percussion cap by a creep spring, upward movement being prevented by the light brass cover which is crimped in the middle and engages in a "V" groove cut around the ignition tube.

When used by hand, the head of the ignition tube is given a sharp tap to drive the firing pin onto the percussion cap. After a delay of 4 to 5 seconds, a fuse detonates the burster, scattering the phosphorus. When used with the grenade discharger, the shock of discharge has the same effect as tapping the grenade when thrown by hand.

b. Incendiary Hand Grenade

This weapon has a diameter of 2.2 inches and an over-all length of 13.5 inches, including the wooden handle 5.3 inches in length.



The incendiary filling of the grenade is composed of white phosphorus and carbon disulfide with 41 cylindrical rubber pellets. Upon explosion, these pellets are scattered and bounce about, igniting any inflammable matter with

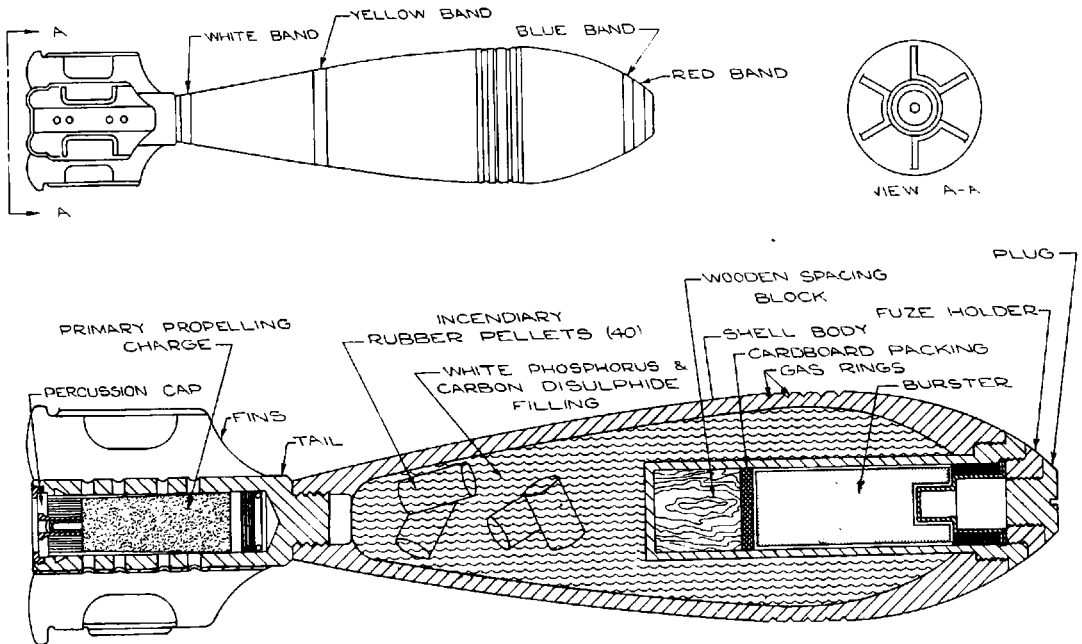
which they may come in contact.

The detonating apparatus for this grenade is similar to that of the 1/2-kilogram incendiary grenade previously described, except that the fuse gives a delay of 6 seconds.

c. 90-mm Incendiary Mortar Shell, Type '94'

The incendiary filling in this bomb is similar to the hand grenade described in paragraph b. above, being composed of white phosphorus and carbon disulfide with 40 cylindrical rubber pellets.

The tail arrangement is designed for one primary and six secondary charges.



The total weight of the bomb is given as 11.6 pounds, the incendiary filling as 2.2 pounds, and the burster charge as 2.8 ounces, while the over-all length is 16 inches. Its maximum range is reported to be about 4,000 yards.

10. JAPANESE PERSONAL DECONTAMINATION KIT

a. Description

The decontamination package shown below is intended for use by the individual soldier in destroying liquid vesicants that may have come in contact with his skin. The package consists of a carrying bag or pouch, a can of decontaminating agent, and a roll of absorbent cotton. The decontaminating agent has been identified as 17.8 percent sodium beta naphthalene sulfonchloramide and 82.2 percent clay. The active chlorine is 2.66 percent on the bone-dry basis. The active agent is apparently rather stable, as no corrosion was evident on the particular metal can examined. Decontamination is accomplished by mixing the agent with water and applying it wet to the skin with absorbent cotton. Approximately 45 grams (1.6 oz) of the decontaminating agent and 2.5 grams (0.09 oz) of the absorbent cotton are supplied. The can is of metal with a screw top and measures 3.1 by 2.3 by 1.2 inches. The carrying bag is of cloth, with cloth tie-strings and a fiber fob. The entire package weighs 95 grams (3.3 oz). The translation of the inscription (see sketch) on the front of both the bag and can is "Decontamination Kit."



b. Directions for Use

The label on the reverse side of the can gives instructions for decontamination, in substance as follows:

- (1) As quickly as possible, tear off the absorbent cotton in the enclosed

package, a little at a time, and lightly blot or soak up the chemical which is present on the skin.

(2) Undo the screw top of the can and pour in some water. Close the opening with the finger, and shake. Use the contents while in a muddy condition.

(3) Spread the decontaminant over the skin and gently rub it in.

ENGINEERS

11. GERMAN WINTER FIELD FORTIFICATIONS, AND THE USE OF ICE-CONCRETE

From the Eastern Front comes a report of the German type of winter field fortification and shelters, with a description of an effective concrete made of a frozen sand, or sand with broken stone, and water mixture.

* * *

a. General

Construction of field fortifications in winter presents a number of special difficulties due to cold, frozen ground, ice, and snow which may occasionally reach a depth of several meters. The men's capacity for work is moreover lowered by extreme cold. For this reason allowance must be made for a considerable increase in time and personnel requirements, often amounting to many times the normal. Special tools and equipment suitable for work under winter conditions must be obtained well in advance.

The depth to which ground is frozen on the Eastern Front often reaches 1.5 meters (5 ft.).

b. Camouflage

In snow-covered terrain, special attention should be paid to concealment against ground and air observation. Paths caused by trampling, ditches, working sites, etc., can be recognized from the air with particular ease. For this reason, before beginning work snow should be cleared to one side so that it may be available for subsequent camouflage, and finished work must again be covered with snow. Trenches can be covered with planks, beams, pine branches, or sheet-iron, on which snow should be heaped.

c. Construction of Shelters, Trenches, and Breastworks

(1) Construction of Earth Shelters in Frozen Ground

(a) In the presence of the enemy, for speedy and silent preparation of shelters in frozen ground sandbags are used; for this purpose, canvas rather than paper sacks are to be recommended. Sandbags are filled in the rear, and carried forward to the point where they are to be used. Freezing sandbags by pouring water on them improves their protective properties for the duration of cold weather.

(b) Where the tactical situation permits unimpeded work, the following practice is adopted. In constructing trenches in ground which is not frozen to a great depth, in order to avoid the labor of digging through the frozen ground, the surface is divided up by furrows into the desired sections. These sections are then undermined, and the frozen crust is caved in and removed. For this work heavy pickaxes, crowbars, iron wedges, etc., are necessary.

Deeply frozen ground can be broken up by engineers using power drilling equipment (concrete breakers driven by portable compressors) and explosives. Holes for explosives can be made in frozen ground by driving in red-hot, pointed iron rods or crowbars. In excavating trenches in deeply frozen ground, the best method is to dig holes at an interval of several feet down to the full depth of the trench; these holes are subsequently connected by tunnels under the frozen surface, and finally the surface is caved in.

(2) Construction of Shelters in Snow and Earth

If the depth of snow is great, fieldworks must be constructed partly in snow and partly in the ground. Small shafts are sunk to the full depth, planned and are then connected by trenches dug in the snow. The deepening of these trenches into the ground can be carried out later. If there has been only a short frost before the snowfall, the ground will be found to be only slightly frozen, since the snow acts as a protective layer against hard freezing.

(3) Construction of Shelters in Snow

If heavy snowfall is to be expected, or if time is short, or if equipment for excavation of frozen ground is not available, breastworks of snow can be erected on the surface. Snow, if it is to be used as protection against enemy fire, must be tamped solid. It must also be camouflaged by scattering loose snow over it. Its effectiveness as a protection is raised by pouring water over it. The rear side of the breastwork should be revetted with sandbags filled with snow; canvas rather than paper should be used for this purpose. Alternative materials are round timber, wire netting, or wooden planks secured to posts, like a fence.

If it is impossible to drive in or anchor the posts, simple trestles of triangular cross section should be erected at intervals of 5 to 6 1/2 feet, as shown in figure 1. The best practice is to carry the trestles ready-made to the site

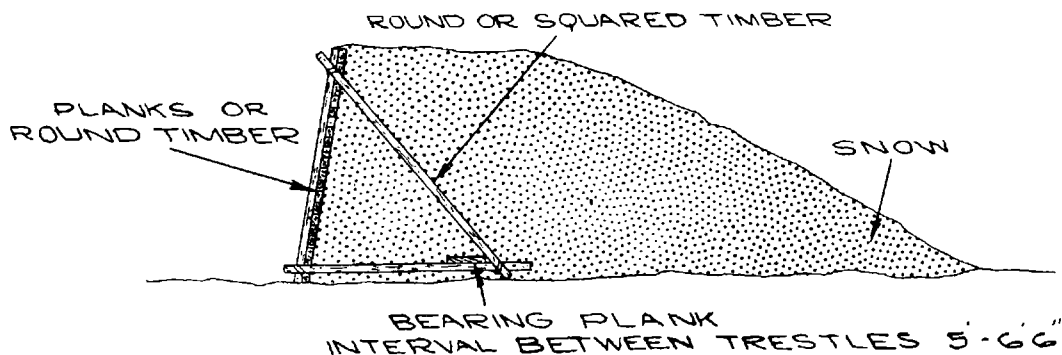


FIG. 1

where they are to be used. After adding the revetment and bearing planks, snow is shoveled over it and tamped hard. The center of the snow wall can be formed

of any other suitable material: e.g., round timber, stones, gravel, sand, etc.

(4) Protective Qualities of Snow and Ice

The following are the thicknesses of snow and ice which afford protection against ordinary rifle fire, but NOT against fire concentrated on a single point:

New snow	(minimum) 13 ft
Tamped snow	(minimum) 8 - 10 ft
Frozen snow	(minimum) 6 ft 6 in
Ice	(minimum) 3 ft 3 in

(5) Covered Trenches

Trenches can be covered over to protect them from snowing-up, and to conceal them, as shown in figure 2. The cover of round timbers, sawn timbers, planks, or beams must be strong enough to carry the maximum weight of snow that can be expected.

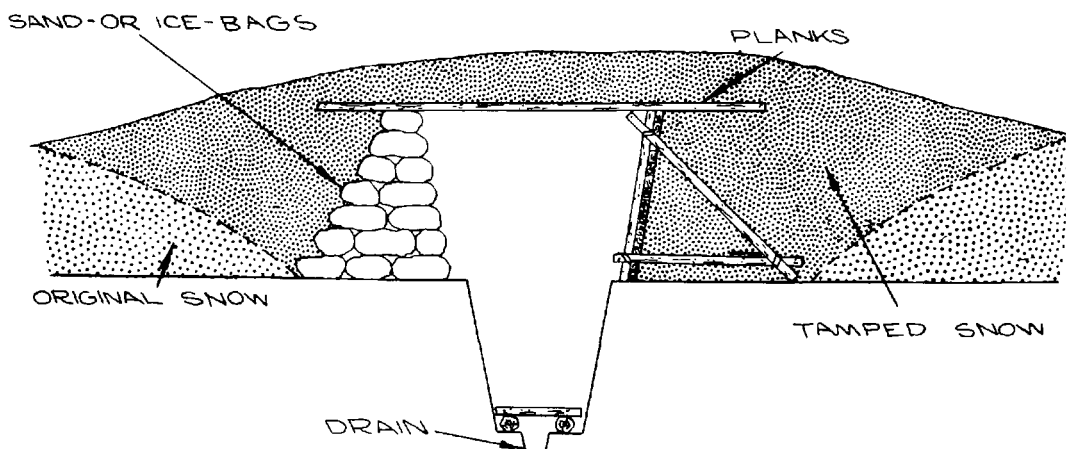


FIG. 2

d. Tunneling in Snow

If the snow is sufficiently deep, tunnels can easily be constructed. They do not provide effective protection against artillery fire, but this disadvantage is considerably outweighed by the complete concealment they afford. The method of construction varies according to the condition of the snow, which may be new (powdery), already frozen, and of varying depths. The following are the methods employed:

(1) Digging in from the surface and covering over with planks and layers of snow;

(2) Digging in from the surface and the construction of sheeting or re-vetting with planks, beams, brushwood, or sheet-iron;

(3) Underground tunnelling, construction of wooden sheeting or revetting with planks, beams, or brushwood (figure 3);

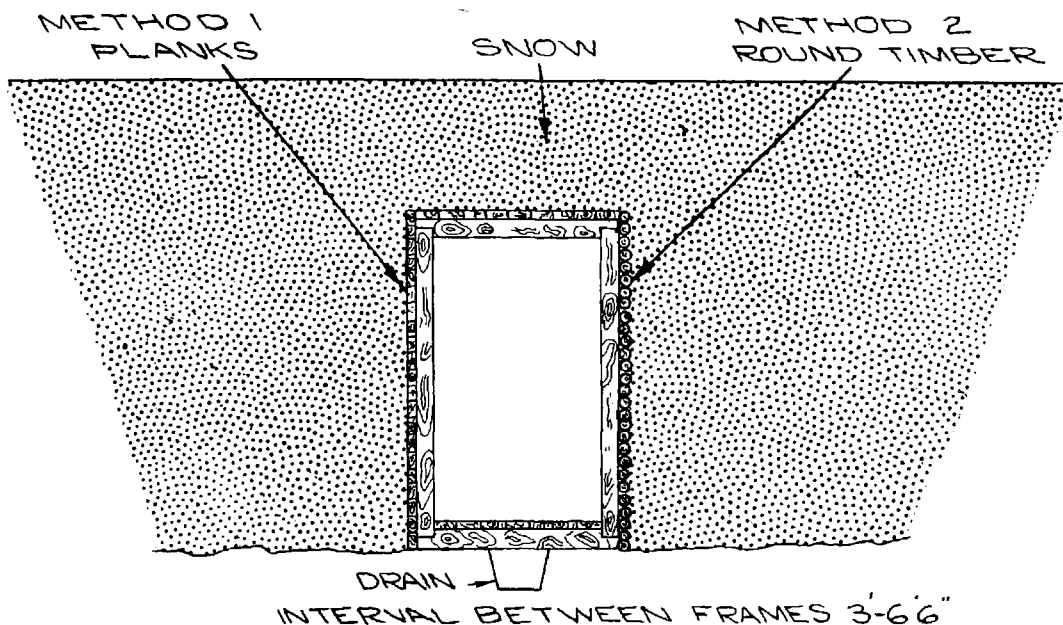


FIG. 3

(4) The construction of tunnels without sheeting (figure 4). In long tunnels, ventilation must be provided by ventilation shafts, as shown in figure 5.

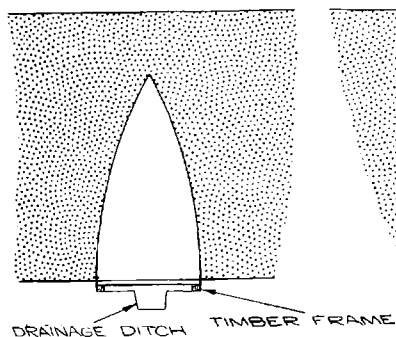


FIG. 4

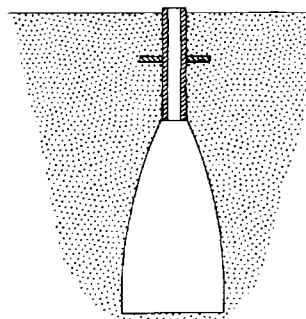


FIG. 5

e. Construction of Shelters, Covered Positions, Positions for AT or Infantry Guns, and Ammunition or Supply Shelters

The same methods are used as in construction in the ground. The floor and walls should be constructed with particular care, and the roofing formed of planks or beams. In addition, roofs and walls must be covered with roofing felt, which should also be laid under the floor. Inner insulation must also be provided by mats and straw, layers of wool, or sacking, and cracks should be filled with moss, sod, or straw. Another effective method of building walls is to use a double revetment of planks with a heat-insulating space between them. The revetment of intermediate space is necessary not only as protection against cold, but also to avoid the melting of the snow by internal heating stoves, etc. Doors and entrances should be small and well fitting. Even if shelters are unheated, a snow covering of sufficient thickness will raise the temperature in shelters of this kind to 3 to 5° C (37 to 41° F). Owing to their slight insulating properties, sheet-iron side walls are suitable only for excavations which are not to be occupied by personnel.

f. Drainage

When a thaw sets in, special provision must be made for draining away water, and this should be provided, when the position is first constructed, by ditches and other methods. Crawl-trenches and tunnels must be built with a gradient sufficient to drain the water away. Failure to observe these precautions will quickly result in the flooding of the excavation and the caving-in of the weakened and undercut walls.

g. "Ice-Concrete"

(1) Definition

Ice-concrete is a dense, frozen mixture of sand and water, or sand with gravel or broken stone and water.

(2) Application

Ice-concrete is especially suitable for reinforcement of breastworks and for the construction of roofs and shelters. An example is shown in figure 6 on the following page. Ice-concrete can be protected for a considerable period against effects of rising temperature by being covered with earth.

(3) Strength and Composition

Ice-concrete is many times stronger than normal ice. Regarding its composition, experience is as follows:

(a) A high proportion of fine sand increases the strength. The strongest mixture of all is composed of sand alone.

(b) If insufficient sand is available, gravel or broken stone can be used. The proportion of fine sand should, however, not fall below 10 percent.

(c) A small proportion of topsoil, clay, or mud is not injurious.

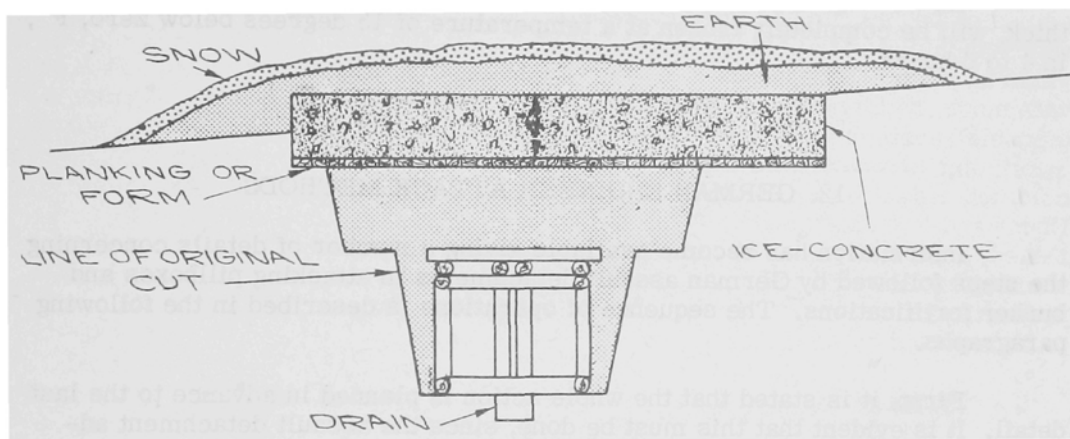


FIG. 6

(d) Only as much water should be added as the mixture is capable of absorbing, and as will cause it to become slightly liquid.

(4) Preparation of Ice-Concrete

(a) In preparing the mixture by hand, it is shovelled over, if possible in a trough, and the water added gradually; or, mixing can be done in a concrete mixer. The wet mixture is immediately poured into the forms. This operation is carried out in layers of from 4 to 6 inches, accompanied by tamping, in order to consolidate the mixture.

If gravel is used, the material is pre-mixed without adding water. The mixture is then poured into the forms in layers 4 to 6 inches thick, and water is poured in to complete saturation, accompanied by stirring and tamping.

(b) In both cases successive layers should be added as soon as the previous layer is beginning to freeze. Freezing takes place more slowly if the water is added later. In order to hasten the process of freezing, sand and gravel should be already at a freezing temperature before water is added, and the water itself should be as cold as possible. If the material is frozen in large lumps, it should be broken up before mixing.

(c) Ordinary wooden forms should be used, but snow, ice, earth, straw, or brushwood can also be used for this purpose.

As a protection against warming from inside (i.e., heating by stoves, etc.), the inner forms are left standing. The outer forms should be removed as soon as possible in order to hasten freezing.

(d) As a guide, it may be noted that a sheet of ice-concrete, 4 inches thick, will be completely frozen at a temperature of 13 degrees below zero, F°, in 4 to 6 hours.

12. GERMAN ENGINEER ATTACK METHODS

Information has become available giving a number of details concerning the steps followed by German assault detachments in attacking pillboxes and bunker fortifications. The sequence of operations is described in the following paragraphs.

First, it is stated that the whole action is planned in advance to the last detail. It is evident that this must be done, since the assault detachment advances very closely behind the artillery barrage directed on the point under assault.

The initial step in the assault is to utilize heavy artillery fire to form craters in the area in front of and behind the barbed-wire entanglement; the assault troops then advance, taking advantage of these craters until they reach the barbed-wire entanglement. At that time, a green Very light is fired, and this is the signal to advance the artillery fire in order to localize it more on the pillbox or bunker under attack. This forces the defenders to keep the embrasures fairly well buttoned-up and gives the attackers a chance to clear a path through the barbed wire.

The leading elements of engineer troops, who have advanced up to the barbed wire, then push forward their bangalore torpedoes and signal "Ready for ignition." When all the bangalore torpedoes are in place, the leader of the assault detachment signals "Ignite all together." Ignition is then completed as nearly simultaneously as possible. The man responsible for each ignition signals "Ignited" when his job is done, and then retires some 5 yards or more to cover. Generally the laying and firing of the torpedoes takes place under a smoke screen created by smoke grenades to prevent the enemy from observing the action at the wire entanglements.

Once the wire has been breached, the leader signals "Detonation has taken place, gap here"; the leader, followed by the assault detachment, then rushes through the gap in the wire. At this point it becomes more than ever necessary to prevent the defenders from firing on the assault troops. This is accomplished by delivery of artillery or antiaircraft direct fire at close range against the embrasures to force the defenders to keep the embrasures closed.

Artillery fire is also put down behind the pillbox to prevent the defenders from emerging. Smoke is also used to mask the pillbox in order to further reduce the visibility of the defenders. The flame-throwers, who have been following up the leading detachment, now move forward to within about 5 yards of the pillbox and attack the embrasures; this forces the defenders to close completely the embrasures, or to desert them. At this time the demolition squads fix their pole charges, and at the signal of "Last jet" from the flame-thrower, they rush forward and place their charges against the embrasures, after which they signal "Ready to ignite." The leader waits until all demolition charges are reported in place and then signals "Ignite." This is done, and the entire detachment takes cover. As soon as the embrasures have been blown in, men are detailed to guard them so that no one can escape.

As soon as the pillbox has been silenced and occupied, a signal "Mission accomplished" is given.

13. ANTILIFTING DEVICE FITTED TO FRENCH ANTITANK MINE

During the British Eighth Army's advance, French antitank mines fitted with an antilifting device were encountered. The device consisted of a German-prepared demolition charge fitted with a pull-igniter connected from beneath to the mine pressure-plate.

INFANTRY

14. GERMAN PATROLS IN NORTH AFRICA

The following items of information on certain German patrols in the El Alamein area have been obtained.

The patrols in question occurred at regular intervals of 4 days, the men being drawn from the various platoons in the company. At no time was a complete squad or platoon as such detailed for a patrol. One patrol consisted of 16 to 18 men under a platoon commander. The men were formed into two squads, and only the squad leaders were told the plans for the patrol. They left their main line of resistance and went out 1,500 to 2,000 yards in front of their minefields, in single file. Five or six men stayed behind to guard the gap through the minefield.

On another patrol, the covering party consisted of an NCO and six men armed with one machine gun, one Tommy gun, and hand grenades. A third patrol consisted of the equivalent of two platoons under the command of a company commander.

Neither telephone nor portable radio set was taken on these patrols, and no artillery officer accompanied them.

15. GERMAN USE OF AIRCRAFT FOR GROUND SECURITY AT NIGHT

On two occasions at night, British ground patrols in the El Alamein area observed a German Fieseler Storch take off and circle around them firing its machine guns. It has been suggested that this may be a method of ascertaining the strength of hostile patrols and ensuring ample warning if an attack in force is under way.

Comment: This is a small German plane comparable to the U.S. liaison plane. It can take off and land in very limited space and is used for liaison, courier service, observation, and similar tasks. Division and higher commanders sometimes use it for reconnaissance and as a means of transportation.

16. JAPANESE TACTICS IN NEW GUINEA

The following is a brief note on Japanese land tactics in the Milne Bay area (southeastern New Guinea). It also touches on their treatment of their own wounded.

* * *

When the Japanese met our line of skirmishers, they fired all their machine guns into the tree-tops above our men. As soon as this fire was

countered by our machine guns, their mortars opened up on our machine-gun positions.

On several occasions, when our line of skirmishers was met, large numbers of Japanese ran forward and were met by withering machine-gun fire. They immediately turned and fled. Our men, with the usual cry of "After the bastards," rushed after them with fixed bayonets. Immediately, the fleeing Japanese threw themselves on the ground and our troops ran into machine-gun fire from the Japanese rear.

In the Milne Bay area, the Japanese plan was to advance and attack during the night and then to withdraw during the daytime, leaving dozens of their men at the top of coconut palms and in the jungle, with machine guns and Tommy guns. As our forces advanced the next day, they were harassed by these remnants. Often the Japanese were tied in the tops of palm trees and remained there after they were shot. (The Japanese practice of advancing at night and hiding during the day may have been dictated on the spot by the constant strafing and reconnaissance by Allied aircraft.)

The plan eventually developed by our own forces as they advanced during the day was to drop a platoon or two each 400 or 500 yards as they advanced; eventually, they would meet the main Japanese forces. By nightfall each of the independent units and our main force would slash a perimeter clearing of about 200 yards' diameter around their positions, rig trip wires at the edge, and then confidently await the Japanese night attack. This appeared to upset the Japanese plan and proved very successful.

Considerable numbers of the Japanese wounded were evacuated by war-ships, but a number of cases were found of badly wounded men who apparently were considered not worth removing, having been shot through the heart by their own troops.

17. SOME PRINCIPLES FROM THE WAR ON THE RUSSIAN FRONT

Although Germans introduced "Blitzkrieg" tactics, to a great extent they themselves evolved the tactical countermeasures to this form of attack. The Russians, who have fought two major defensive campaigns, have been quick to seize, adapt, and even improve on the defensive tactics employed by the Germans in the winter of 1941-42.

a. Anti-Blitz Defense

As a result, the effective defensive measures as developed by both sides are principally represented by:

(1) The "Hedgehog" system of all around defense in depth based on effective use of any ground, and especially of villages and towns, protected by mine-

fields, and garrisoned by determined troops with a coordinated fire plan.

(2) The rapid conversion of strategically important inhabited localities into modern fortresses with every street and house an actual strongpoint.

(3) The use of night fighting, in order to give the advancing enemy no rest.

(4) Rapid improvement in means of antitank defense.

(5) Improved disposition and employment of reserves and the better timing of determined counterattacks.

(Note: Dive-bombing, and parachute and glider action, have ceased in themselves to exercise a decisive influence against a well-disciplined and organized defense.)

b. New Offensive Tactics

The problem facing the attacker has been to evolve new offensive tactics and thereby regain for the offensive that decisive preponderance which it had lost for the moment.

The most promising developments so far evolved by both Russians and Germans may be summarized as follows:

(1) Night Fighting

If the enemy can be made to fight night and day without respite, a decisive result may be obtained in a particular sector. The Russians, as soon as they discovered that night fighting caused the enemy particular discomfort, concentrated on this form of warfare. Infantry and engineers are best adapted for these tactics; tanks either provide a diversion or follow the infantry to gain favorable positions for the following day's battle.

(2) New Methods of Coordinating Tank and Infantry Action

Tanks carry or haul heavily armed infantry and engineers to prepare and to hold ground, and to neutralize the antitank defense. (This can be done where there is no undue exposure to small-arms fire.)

(3) Concentration of Effort

Great emphasis is placed on bringing all available fire power to bear simultaneously at the point of maximum effort, thereby causing changes in the doctrine of deployment. The doctrine of deployment by echelon, which does not permit this heavy, simultaneous concentration of fire power, is being abandoned; this doctrine also leads to wastage without any positive returns for casualties suffered.

(4) New Supply Methods

Improved methods are used to supply advancing troops with essentials by air and by armored vehicles.

(5) New Artillery Tactics

Creeping and box barrages are considered ineffective and a waste of ammunition. The barrage is only important in screening friendly troops from counterattack while consolidating newly won ground. Artillery support is based primarily on highly mobile control of artillery fire in close support of tanks and infantry. A large proportion of guns is self-propelled. The air arm is employed in the role of long-range artillery and for strafing reserves, dumps, and lines of communication.

(6) Greatly Increased Infantry Fire Power

This is accomplished principally by increasing the basic allowance of mortars, automatic weapons, and antitank rifles. The number of mortars particularly, and their massed use, have been greatly expanded.

(7) The Employment of Shock Groups

Their composition and armament are highly elastic, but both sides consider they are essential to achieve a decision at the point of maximum effort. The Russians seem to have shock groups organized in special brigades, or even as special shock armies.

(8) The Achievement of More Effective and Mobile Control in Battle

This is accomplished to a certain extent by greater use of aircraft by senior staff officers and commanders, both for reconnaissance in the planning stages and to control operations.

(9) Improvisation and Development of Weapons

Although no really new weapons have been introduced, there has been considerable development in the use of weapons, and the side which is capable of the more rapid improvisation scores an advantage. Thus, the campaign has seen the development of the rocket gun, the multiple grenade projector, the multiple-barreled rocket projector, and rapid increase in the caliber of antitank rifles and of antitank and tank guns.

c. Important Factors

The important factors which appear to have assisted the Russians to keep up in this keen competition for tactical superiority are:

- (1) A centrally controlled and adaptable industry which can provide

rapidly improvised weapons to meet or surpass the enemy's latest technical improvement.

(2) Intense and continuous training in the latest tactical innovations and ruses--night fighting especially requires very extensive and concentrated training.

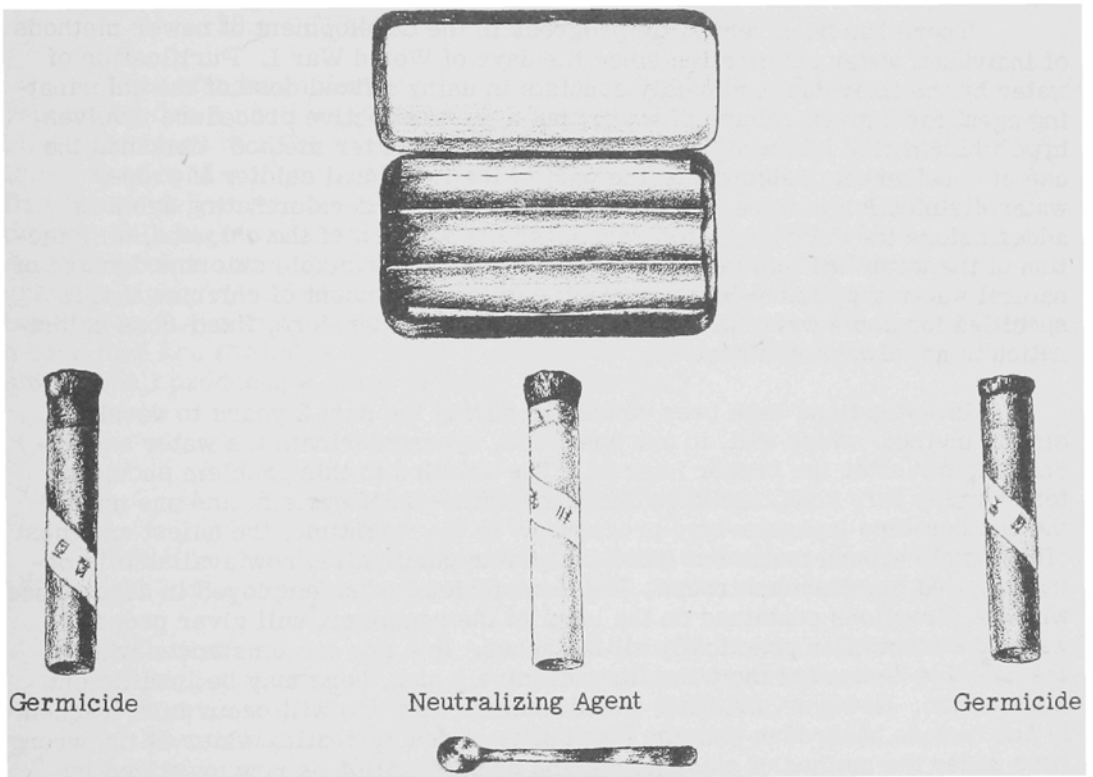
(3) Elasticity of tables of organization and basic allowances to meet changing battle requirements.

MEDICAL

18. JAPANESE WATER-PURIFICATION KIT

a. Description

The Japanese water-purification kit shown below is intended for use in rendering water found in the field fit for human consumption by chlorinating and destroying harmful bacteria. The kit consists of two vials of "germicide" (the chlorinating agent), one vial of neutralizing agent, a small aluminum spoon, and a metal box with a hinged lid.



The chlorinating agent is composed of a mixture of calcium and sodium hypochlorites; active chlorine content is 7.05 percent. The neutralizing agent, used to destroy the chlorine, is sodium thiosulfate. The vials of germicide contain about 5 grams (0.18 oz) of the agent, while the vial of neutralizing agent contains 5.3 grams (0.19 oz). The cork ends of the vials are dipped in paraffin wax for protection of the contents. The metal box measures 1.75 by 0.6 by 3.4 inches and is fitted with a cardboard liner to protect the glass vials.

b. Directions for Use

A label pasted to the top of the box gives the following directions for use:

(1) Put one spoonful of the germicide into a flask (about 1 quart) full of water. Insert the cork and shake well for about 5 minutes.

(2) After a further 5 to 10 minutes have elapsed, add one spoonful of the neutralizing agent and shake.

(3) Wipe the spoon thoroughly after using.

Comment: The spoon holds from 3 to 4 grains and a single kit can therefore be used from 15 to 20 times.

There has been very little progress in the development of newer methods of individual water purification since the days of World War I. Purification of water by the individual ordinarily consists in using a fixed dose of the chlorinating agent for a given volume of water, but a more effective procedure involves hyperchlorination followed by dechlorination. The latter method demands the use of considerable judgment on the part of the individual soldier if proper water disinfection is to be accomplished, since if the dechlorinating agent is added before the chlorine, or too soon after the addition of the chlorine, disinfection of the water will not take place. Because of the variable chlorine demand of natural water supplies encountered in the field, the amount of chlorine that is specified for some water is insufficient for others; therefore, fixed-dose chlorination is not always satisfactory.

Investigations have been conducted during the past 2 years to develop a simple method which will, in one operation, hyperchlorinate the water and dechlorinate it after the proper interval. The solution to this problem should be forthcoming very soon, and should furnish a fool-proof system, and one unlike the cumbersome Japanese-type procedure. In the meantime, the safest and most efficient all-around method of individual water purification now available is being supplied to American troops. Halazone tablets, when employed in accordance with the directions contained on the label of the container, will give proper water disinfection in practically all instances. In a few circumstances where the chlorine demand of the water is excessively high, there may be insufficient disinfection. However, evidence would indicate that this will occur less frequently and be less hazardous than the possibility of dechlorinating water at the wrong time under the method of chlorination and dechlorination as now practiced by some armies.

ORDNANCE

19. INTERCHANGEABILITY OF PISTOL AMMUNITION

It is now known that ammunition of the 9-mm Italian pistol Model 910 (Glisenti) is interchangeable with all standard types of German Luger (Parabellum), pistol and submachine-gun ammunition. These Italian cartridges may be recognized by the bullet, shaped like a truncated cone. British 9-mm ammunition for the British Sten & Lanchester submachine gun will function in German and Italian 9-mm weapons that use the above ammunition.

20. GERMAN 150-MM INFANTRY HOWITZER

This standard infantry horse- or motor-drawn support weapon, will reportedly fire a shell weighing about 85 pounds, either HE or smoke, with a minimum range of 1,012 yards and a maximum of 5,140 yards. The ammunition is not fixed, and six types of charges are used. Either low- or high-trajectory fire can be delivered, the velocity and trajectory depending on the charge employed. Silk bags contain the powder, with a rimmed brass cartridge case to seal the breech and carry the percussion primer. Operating on impact or graze, a highly sensitive nose-percussion fuze gives either an instantaneous burst or an 0.4-second delay. While no details of a concrete-piercing shell with a base fuze are available, it would seem probable that one may be issued. The smoke shell produces a cloud 55 yards in diameter.

21. GERMAN LONG-RANGE 172-MM GUN

From the Middle East, unconfirmed details are reported of a 50-caliber, 172-mm (6.7 in) gun with a range of over 30,000 yards, as follows:

Caliber	172.5 mm (6.79 in)
Length of bore	50 calibers (approx)
Muzzle velocity	1,970 - 2,300 f/s
Maximum range	30,520 yds
Traverse - on platform	360°
Traverse - on carriage	16°
Elevation	70°
Weight of shell	140 lbs (approx)
Ammunition	Percussion, or time fuze
Rate of fire	1 rpm
Gun detachment	12
Weight in action	16 1/2 tons

Normally the gun and carriage are separated for transport, but they have been towed complete by an 18-ton half-track vehicle.

QUARTERMASTER

22. A 550-POUND "FOOD BOMB"

A further development of the "food bomb" technique (see Tactical and Technical Trends, No. 20, p. 30) indicates that the Germans are now using air-plane food-containers of 250 kilograms (550 pounds)--much heavier than the 30-pound containers previously noted. Me-109 fighters are apparently envisaged for use in dropping supplies to army units cut off during operations.

To feed such isolated groups, the Me-109 (E, F, and G models) when fitted with bomb carrier EPC 500,* can drop the food container. The container, when in position, clears the ground by only 38 inches. To avoid damage when taxiing on a bad field, it should be suspended in the bomb rack at the take-off only. The maximum speed at release is 215 mph, and the most favorable height from 500 to 1,000 feet. It would appear that there is a delay device for the release of the parachute.

23. ENEMY FUELS EXAMINED

Tactical and Technical Trends, No. 20, p. 26, gave an analysis of some samples of gas and oil used in German mechanized vehicles. It is evident from the following report that the enemy continues to maintain a high standard for gasoline and other fuels.

a. Aviation Gasoline

There are still two chief types of fuel in use in the Luftwaffe: viz., B. 4 ("blue," generally used in bombers) and C. 3 ("green," used in fighters).

During the last year, there has been no fundamental change in the quality or method of production of the blue-type fuel. The base spirit is of petroleum origin. If it emanates from current Axis production, it probably comes from Rumania. It is understood, however, that the quantities involved do not preclude the possibility of its derivation from pre-war or captured stocks of American or Venezuelan aviation gas.

It is blended to 90-octane by the addition of mixed high-octane gasolines, aromatics or hydro-gasoline, and T.E.L. (tetra-ethyl-lead). A previous conclusion that usually two of these blending agents (and T.E.L.) are used in conjunction has been confirmed. It has been suggested that the added high-octane gasolines come from captured stocks, and this is a possible explanation of the small concentrations used.

The reason for the continued use of blue fuel is not yet clear. There is no evidence of any increased use of hydro-gas--if anything, the reverse is true.

*Bomb carrier for 500-kilogram bomb.

Evidence strengthens the view that the C. 3 green fuel is capable of giving very high performance, and that it has an exceptionally good rich-mixture performance, considerably better than 100-octane aviation gasoline.

The origin of the aromatics in the green fuel is not certain, but the possibility of making them by the treatment of hydrogenation products from creosote has been established.

The method of preparation which most closely fits the analysis of this green fuel is the blending of a light cut of straight-run petroleum spirit with gasoline or naphtha, produced from creosote by some form of aromatising hydrogenation, and with the addition of high-octane materials.

All German aircraft fuels continue to show the presence of about 5.5 milliliters of T.E.L. per imperial gallon.

b. Motor Fuels

The test results on motor fuels from Europe, as well as other information available, suggest that T.E.L. is not being used, but that alcohol is being employed to a limited extent. A number of samples from the Middle East contained T.E.L.; others contained alcohol. A fair proportion of both sets of samples from Europe and the Middle East contain a high percentage of aromatic hydrocarbons, indicating that there is no general shortage of aromatics in Germany.

Octane numbers vary widely, and from the very low antiknock value of some of the motor gasolines captured in the Middle East, it would appear that local blending with benzol, alcohol, and/or T.E.L. must take place.

c. Other Fuels

The high-speed diesel-fuel samples from Europe are all of low pour-point, some as low as minus 40° C; it is suggested that a number contain Fischer-Tropsch gas oil (probably a special process for mixing gas oil) mixed with creosote. The low pour-point indicates that extensive provision has been made for dewaxing. On the other hand, some high-speed diesel-fuel samples from the Middle East are of much higher pour-point, showing that the enemy may have segregated them according to the type of climate in which they are to be used.

Several fuels appear to be of Rumanian origin, while one may be Persian. For heavy bunker fuels, coal tar products are being used in some cases.

SIGNAL CORPS

24. GERMAN EMERGENCY SIGNAL CONTAINER AND FLARE PISTOL

The Notsignalbehalter, or emergency signal container, is a watertight semicircular case which can be carried by means of a one-half-inch leather or web strap. The case is made of thin sheet iron, and the cartridge holder inserts are made of sheet aluminum. The pistol contained in it is made either of aluminum or an aluminum alloy. Each container has in it one flare pistol, 10 red-star signal flares, 7 green-star signal flares, and 7 white-star signal flares. In the particular container examined there were three semicircular cartridge holders (only one shown in accompany sketch) and one flat cartridge holder (not shown in sketch). There were six cartridges in each holder.

The emergency signal container has been observed being carried by German parachute, air, foot, and tank troops. It is a very neat and compact unit which, besides being watertight until time of use, is very light in construction.

The total weight of the entire unit is 8.04 pounds. The following is a breakdown of the weights of the container and various components:

Entire case	8.04 lbs
Case without cartridges	2.70 lbs
Semicircular insert with cartridges	1.10 lbs
Flat insert with cartridges	1.00 lb
Live individual cartridge	0.16 lb (approx)
Expended cartridge	0.05 lb
Pistol	1.58 lbs

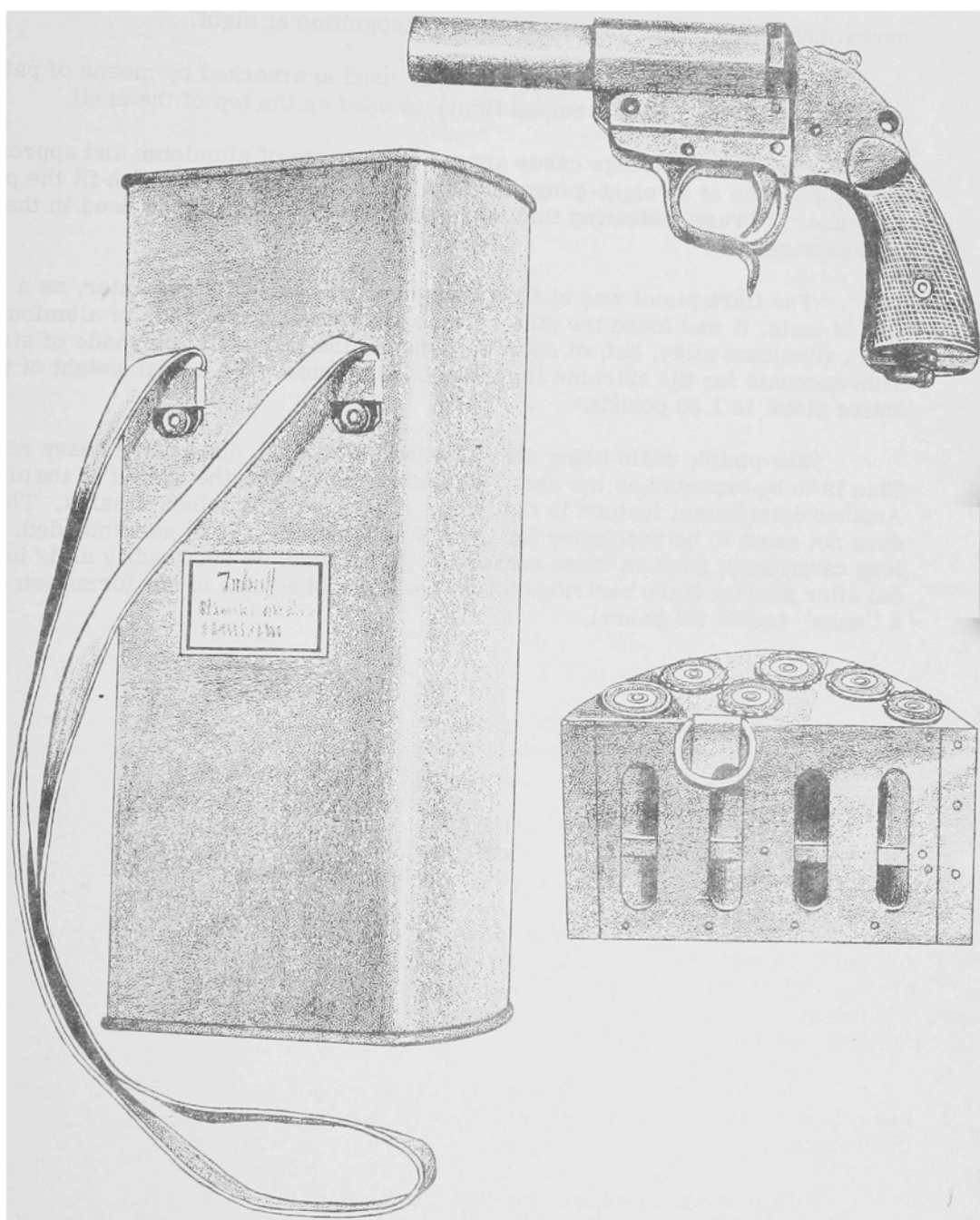
The weights of the individual cartridges varied from 0.15 to 0.18 pound for the different colored flares. An approximate weight is therefore taken.

The container is of a semicircular shape, approximately 13 inches high and 7 3/4 inches wide. It is approximately 4 inches from the flat side of the container to the center of the opposite curved side.

Besides the regular ones, a wide variety of additional flares are available for the flare pistol; they consist of parachute, high-burst, low-burst, yellow smoke, and whistling flares, and four blue streamers. The regular red, white, and green flares are also manufactured in cartridges approximately 3/4 inch shorter than the regular cartridge.

It is also of interest to note that the Germans have designed a small grenade to be fired from the pistol. This serves to illustrate the versatility of the weapon.

A rather important feature of the red, white, and green flares was the method of identification. The color of the flare is painted on the base and end, and also on a strip around the cartridge just above the base. In addition, for purposes of night identification, the red flare has a base serrated completely around, the white flare has only half the base serrated, and the green has no



GERMAN EMERGENCY SIGNAL CONTAINER AND FLARE PISTOL

serrations at all. This makes for ready recognition at night.

Flares of other colors and for other used are marked by means of painted stripes and bands. Also, a raised figure is used on the top of the shell.

The flare cartridge cases appear to be made of aluminum and approximately the size of an eight-gauge shotgun shell. Other flares which fit the pistol had cases of brass, indicating that more than one type of metal is used in the manufacture.

The flare pistol was at first thought to be made of steel; later, as a result of tests, it was found the pistol frame and barrel were made of aluminum or an aluminum alloy, but, of course, various pins and parts are made of steel. This accounts for the extreme lightness of the pistol. The actual weight of the entire pistol is 1.58 pounds.

The pistol, while being very light and versatile, has a very heavy recoil. This is to be expected, as the recoil varies inversely with the weight of the pistol. Another detrimental feature is that it has a very large number of parts. This does not seem to be necessary for the use to which the pistol was intended. Also long cartridges, such as those containing parachutes, do not readily slide in and out after shorter flare cartridges have been fired because of the formation of a "cake" inside the barrel.

SECTION II

OPERATIONS AND TACTICS--GUADALCANAL

OPERATIONS AND TACTICS--GUADALCANAL

PART I

GUADALCANAL OPERATIONS

The following is an informal report on Guadalcanal operations by a high-ranking U.S. Marine officer. It is not, and was not intended to be, a complete report, but consists of observations on certain aspects only. For purposes of security certain portions of the original report have been omitted.

* * *

LANDING OF JAPANESE REINFORCEMENTS

You are all acquainted with the endeavor of the Japanese to knock out our air and neutralize our effort on Guadalcanal. They tried it time after time without success, and their whole counteroffensive was frustrated on that account. Seeing that they could not knock the air out, they attempted on several occasions to come down with navy transports without air coverage.

Throughout late September and early October the so-called "Tokio Express" landed troops on the islands from cruisers and destroyers. This method the enemy found slow and unsatisfactory. In the first place, they could carry very few troops in the cruisers and destroyers; and in the second place, they could carry no heavy materiel. It was therefore absolutely necessary for them to come down with naval transports. On the night of the 13th and 14th of October, they came in with a striking force of surface ships off Guadalcanal. The battleships lay off Savo Island at a range of 34,500 yards. The cruisers were closer in, and the destroyers were just out of range of our 5-inch shore batteries. They bombarded Henderson Field for 2 hours and 45 minutes with 16-, 8-, and 5-inch shells. The damage to personnel was negligible. The damage to ground materiel was also negligible.

We could not prevent the convoy of six transports from coming in. One of them, however, was sunk on the way down. Four of the transports were beached in order to unload. By 1 o'clock that afternoon all four of the beached transports were on fire. The dive-bombers had accounted for three of them, and the B-17's, which flew over, accounted for one. The sixth, and remaining transport, was hit with a thousand-pound bomb. It turned away and left, together with its escort vessels. This belated destruction could not prevent the enemy from landing some 16,000 Japanese troops on the island. They did not succeed, though, in getting off very much heavy materiel. They managed to get off a company of light tanks and a battery of long-range artillery. ***

JAPANESE GROUND ATTACKS, OCTOBER

The Jap attacks on October 25 to 28 were ground attacks, which were a result of this landing. *** This was their last really major effort. It was put on by a division, plus two additional attached regiments. They attempted to cross from the west with a mass attack of tanks followed by infantry. The rivers, in

the dry season (except the Lunga and the Matapona), are more in the nature of lagoons than rivers. There is a beach which closes up the mouth of the river, and they are about 15 to 20 feet deep down at the mouth. They go up to about 10 feet for 1 1/2 or 2 miles inland. There is a sand-spit that runs across the Matanika River, and the enemy (very foolishly) drove these tanks right along it. I can assure you it was certainly fine shooting for the antitank guns. They knocked out the tanks with the 37's and the 75-mm half-tracks. One enemy tank got through. It might interest you to know that he stopped over a rather deep fox-hole of a man who had the presence of mind enough to reach up with a hand grenade, place it in the tread, pull the string, and duck. It blew a tread off, and the tank wheeled around like a wounded bird, and started right out to sea. He went out until he couldn't run any further. He was then up to his turret - and so a half-track knocked that off.

The command tank in that performance, for some reason or other, decided to come straight across the river, about 50 to 60 yards up from its mouth - and he was not a submarine. He just stayed there, and disappeared out of sight. Realizing that tanks don't go strolling off by themselves, we put down a concentration by 13 batteries on the west flank of the river and walked it back. The next morning we counted 657 Japanese in there.

THE NAVAL ENGAGEMENT, NOVEMBER 12

The night of November 12 was really the turning point of the whole show. The Japanese were making a major effort. They had concentrated up in Rabaul and the Shortland Islands; and also, coming down from Truk, they had from 20 to 40 merchant ships and a sizable fleet, together with 2 carriers. Their striking force for bombardment, with which they hoped to duplicate the October show, came in and was met in a very memorable battle, which almost reminded you of the days of John Paul Jones. The leading destroyer of our fleet opened up on a Japanese destroyer at 200 yards on the port bow. *** The Japanese broke away. ***

For an hour after our ships had broken off, the Japanese were firing at each other.

The next morning, 11 transports appeared. (Our morning search-and-strike had been warned they were on the way down.) We combined a search-and-strike, and fanned out and found 11. The Southwest Pacific air arm had sunk one ship off the Shortland Islands on the way down. They had a full division, some corps troops, a full headquarters staff, and some extra regiments.

By noon, 4 of the 11 transports were sunk. By afternoon, three of the others were burning fiercely and were dead in the water. The other four were burning. The dive-bombers just ran a shuttle service from Henderson Field to the transport group, with our Grummans and P-39's acting as escort. Just as fast as they could get back and fuel and re-arm, they took off again. Those boys worked like nobody has ever worked before, to my knowledge; and certainly they did a splendid job.

That night a U.S. Navy task force came through, and much to the surprise of the Japanese it included two battleships. The opening salvo *** landed on a Japanese battleship, and the thing disintegrated. It was a marvelous sight to see. I had a grandstand ticket for which I paid nothing, sitting up on my observation hills, watching it. The *** put another battleship out so that it could not go more than 5 knots an hour, and we sank two or three cruisers and some destroyers.

The next morning the enemy battleship was lying just north of Guadalcanal between Florida and Savo Islands, and our dive-bombers went out after it. The more they went at it, the madder they got. They hit it with 1,000-pound bombs, and our torpedo planes put their torpedoes in it. At dusk it was still there, though nobody was on it. The next morning she wasn't there; ***.

AIR ACTION

I won't give you a day-by-day account of our air fights. We went in on the 7th, and the field was 90 percent completed. *** It took us 10 days to complete the strip so it could take light craft - the Grummans and the dive-bombers. A week later the P-400's and the P-39's came in. Daily, after the third day, for 72 days the Japanese came down with their usual formation of 26 twin-engine high-altitude bombers. They fly a beautiful formation. They were rather inaccurate in their bombing, but I can assure you that nothing stopped them from coming for the first 10 days. They just kept on coming, they had the air to themselves, and they came over and dropped them. When our planes got there, we were very fortunate in being able to knock down a number of Japanese planes - 541 to be exact.

Our antiaircraft consisted of 90-mm's, plus the lighter 20's, 37's, and 40's. Our antiaircraft knocked out 48 planes. I watched them one day knock out 6, and the Japanese closed in just like it was a parade formation, and kept on coming. They dropped their bombs.

As a little digression, one day after we had been bombed for about 40 days, we got word that this bomber formation was on its way down and we thought that, "Well, this is one time we up here in the jungle are not going to get hit." For there were some 12 of our merchant ships out there in the roadstead. We felt very sorry for the ships - we knew they were going to get it. However, somebody had told the Japs at Rabaul that they were to bomb Henderson Field, and they paid no more attention to those ships than if they weren't there. The bombers came right along and dropped them in the same old place on Henderson Field. This is just an idea as to how they work.

When our P-39's joined us - one squadron of them - they proved themselves to be invaluable as ground-strafting planes. We used them constantly on ground installations and they proved most valuable.

We were most fortunate towards the end to get a squadron of P-38's. They could get upstairs so fast. When we moved towards the west our air support was splendid.

I would like to say here that it is most difficult in jungle country for air reconnaissance to give you any valuable aid as to ground installations which are in dense jungle.

MAPS AND PHOTOGRAPHS

Prior to our landing, we sent our intelligence officer over to Australia. The Australians gave us what they had in the way of maps (which was practically nothing). We had one strip map that went about 500 yards inland and had been taken on a day when there were clouds around - and when you would get nice blank spaces with a picture of the clouds. We were to get additional photographs dropped on us on our way up. We got one - which did help out materially. It was of Tulagi. In that section there are practically no maps available; and, unless you do have constant aerial reconnaissance and pictures, you are going it blind. We were very fortunate on Tulagi. We met with very little resistance; and therefore the lack of maps and photographs was not such a handicap as it would have been under other conditions.

THE U.S. LANDINGS IN THE SOLOMONS

I will just give you a brief sketch of the landing. We were very fortunate on our approach day in having a very low ceiling, without a break in it. So we arrived off Savo Island without the enemy knowing we were there. At that place, the Tulagi support group went to the north of the island, and the Guadalcanal force to the south. As we approached, the opening shot was fired just off Lunga Point. A Zero float plane took off with a cold engine and flew directly at the Australia, the flag ship of the Australian cruisers. It was knocked out by broadside guns when within about 300 yards of the ship. Just at that time our dive-bombers came over and destroyed 18 float planes in the Tulagi area, and in addition destroyed 2 four-engine Japanese Navy flying boats.

The Tulagi landing was first. It was preceded by a naval gun bombardment which took the forward slopes of the hills, supported simultaneously by the dive-bombers taking the reverse slopes. It was a regimental landing, battalions in column. They landed without losing a man. They made for high ground, straddled the ridge, and turned east where the major installations of the Japanese were, throwing in a block to the west to hold whatever was there. I can assure you it was rather rough as they worked their way down through jungle country, against defenses of machine-gun nests supported by mortars.

The Japanese took to the caves and the dugouts that they had built, and tried to defend from there. We tried to drive them out of there with hand grenades, which they immediately threw back to us. When that didn't work, we tied TNT onto sticks and threw that in with a fuse. The men held them as long as they could and then threw them into the caves.

On Gavutu, which was 2 hours later, the Japanese took to the caves first - but they had a good machine-gun defense of the island. We lost quite a few men there; and it goes to show that if they have enough head protection you cannot

shoot them out with naval gunfire, nor can you bomb them out with aerial bombs. On Gavutu the commander, being rather air-minded, had 57 feet of rock over most of the dugouts. They were dug right into the mountains and hills.

In Guadalcanal there was not much opposition, as I said - and our air support over there, every time they had to go back to refuel, would ask for a target. We told them to drop them on Gavutu. So, in addition to getting the bombardment scheduled for it, Gavutu also got practically all of that scheduled for Guadalcanal. Yet, according to a Japanese prisoner's statement, there were only three people killed either by artillery or by ships' gunfire on that island. They were stunned, yes, but they were able to work their machine guns when the landing came off. Gavutu was pure and simple assault. The island was small. It had to be taken in a rush; and that was the way it was taken; and they were eventually driven out of their dugouts as they were driven out on Tulagi.

On Guadalcanal, the ships' guns put down a bombardment on the beach, and, as the assault boats approached the beach, the ships' guns left off. When the leading wave was within 300 yards of the beach, the aerial bombardment lifted. The scheme of maneuver there was to land regiments in column, the leading regiment to seize the beachhead which was 5 miles east of Lunga point, and the second regiment to pass through and attack - the idea being to get behind the Japanese in an endeavor to keep them from getting to the mountains. It went off as planned, with no opposition. They moved - and then the regiment which formed the beachhead moved up the beach, and another one came up the hills on the flank. That going was very dense. *** We arrived at Henderson Field the next morning at 10 o'clock.

The Japanese thought, according to the prisoners that we took, that it was an air-and-sea raid; and they had been instructed on Guadalcanal that in event of air-and-sea raids they were to leave the vicinity of the field, go to the jungle, and not come back until the ships left. When they came back, of course, we were there.

JAPANESE ATTACKS

The first real opposition of any kind that we met on Guadalcanal was when the Japanese Commando battalion of a thousand or twelve hundred men landed south of Henderson Field one night from two cruisers and six destroyers, and made a direct drive at the field right down the beach. Evidently their intelligence was poor or they thought very well of themselves; or perhaps there was a combination of the two. When they hit the Tenaru River, which was 15 feet deep except at the mouth, they tried to force the mouth of this river across a sand-spit in a mass rush. Our 37's loaded with cannister stopped that. We put artillery down on them and then sent a battalion down from the south and pushed them toward the sea. Then, when they were down on the beach line where it was open, we sent a company of tanks down their flank. We accounted for 670 of that Commando Group in that one location, and the next day 156 washed up from the sea.

*** On the night of the 14th and 15th of October, a Japanese regiment had cut their way around the field. This unit was equipped with scaling ropes - every three men had one. They cut in and attacked from the south at the junction of the *** Marines and the *** Regiment [Army], with the *** Regiment taking the brunt of the attack. There was a double-apron wire around there. The attacking battalions thought they had gotten through all the wire because their pictures did not show the other apron we had in the jungle - just on the edge of it. So, when they got through the outer apron, they rose up and with that Banzai of theirs, which they had thought would do half of the work for them, they charged. They were caught on the second apron, and 1,200 of them were knocked out with machine guns and remained at that place.

AIR SUPPORT OF LANDING OPERATIONS

I would like to give you, for what it is worth, what we who were there feel that we learned as to what is necessary for a landing force. In the first place, I don't believe that any landing against opposition is in anyway feasible unless you have an umbrella of air over you which can protect your transports, your surface ships, and your ground troops in landing. There has got to be the closest coordination and the closest timing between the bombardment of the ships' guns, and the lifting of the ships' gunfire and the picking it up by the air. For, there is a little space in there where you cannot have ships' gunfire support, because of the flat trajectory, and where your assault waves are approaching the beach - and unless somebody keeps that beach defense down, it will be rather costly.

I want to say along that line that in this instance the bombardment was beautifully coordinated by the naval air and the naval surface ships; and that from the time a battalion commander called for a concentration on a certain locality by air to the time that the concentration was delivered, it was in one instance exactly 3 1/2 minutes--which is very good going.

I would like to say a few words about the types of planes we felt should accompany a landing force in the South Pacific Theater of Operations. Because of the type of ground we have there, and the type of islands that we have to deal with, the planes must be light aircraft capable of operating from small fields. They must be aircraft that can operate on a reasonable fuel supply.

We had some difficulties along that line. All of our fuel had to be brought in, unloaded into small boats, and then taken ashore. It was unloaded from small boats across open beach, or onto finger docks which we constructed out of palm trees and other material we had. It was then hauled to dumps, and then put into our gas carriers by hand pumps. *** All of that gas had to be man-handled in 50-gallon drums. The first storage tanks went into commission just about the first week in December. When we staged the B-17's through, they took a tremendous supply of gas, which we had to handle by hand in that manner. *** Our major labor question there was handling the gas. The sooner that you can get bulk storage into a place, the better it will be for everyone concerned. ***

PART II

JAPANESE OPINIONS ON AMERICAN TACTICS

These Japanese opinions on American tactics are derived from U.S. Navy sources. The Japanese based these opinions on operations in the Philippines and the fighting on Guadalcanal up to November 1942. It should be noted how strongly the Japanese emphasize the importance of infantry shock action. This is not shock action as we think of it; rather, their concept is limited to the carrying of a position with the bayonet. The emphasis is on the individual soldier, rather than the unit and the coordinated action of all arms. It will be interesting to note what changes, if any, the Japanese may make in their tactics as the result of their defeats in New Guinea and Guadalcanal.

* * *

FOREWORD

American troops on Guadalcanal consist of a main body of Marines, whose quality in character and equipment is the pride of the American forces. With them are cooperating some Army troops and Army and Navy air forces. Although the Army forces will probably be reinforced in the future, it is estimated that the Marines will still be the backbone of their forces.

Judging by the results of the fighting up until now, the information set forth in the "Material for Study on American Tactics" just about hit the nail on the head.

The following investigates the results of their usual methods of fighting, especially in the light of past fighting on this battlefield [Guadalcanal], and will be used as a reference in the next operation.

NOTE: With regard to land warfare, this report is chiefly compiled on the basis of Army combat.

ORGANIZATION AND EQUIPMENT

The organization and equipment of the Marine force are as given in the Table of Organization and Equipment of the American Marine Division and the American Marine Force Independent Battalion, compiled by the General Staff Office in August 1942. For more on equipment and weapons, see the Army Technical Headquarters reference book.

CHARACTER (from official reports on the national characteristics of the American people).

- (1) National unity is fairly strong.
- (2) They like novelty and are adventurous.

(3) They are good at every sort of technique. [It is believed the Japanese mean "good in all technical matters."]

(4) Although they are given to discussion, they possess practicality. However, they take a lot of time.

(5) Although they are optimistic, they lack perseverance.

(6) The American soldier, without support of firepower, is easily overcome and in combat is easily made to throw up his hands and surrender. If wounded, he immediately raises a cry of distress, etc. He lacks hand-to-hand fighting ability and spiritual strength. However, with the support of firepower, he acts fairly aggressively.

TRAINING

(1) Marksmanship is generally good.

(2) Hand-to-hand fighting ability is extremely poor.

(3) Night actions are inexpertly carried out.

(4) Communication technique is excellent.

(5) Reconnaissance and security patrol training is very inadequate; however, their reconnaissance aviation is generally all right.

(6) Air-ground liaison is good.

(7) The training of artillery and their method of using it are generally good.

(8) They are skillful in operating tanks and automobiles.

COMMAND AND COMBAT LEADERSHIP

(1) They subscribe to the principle that fire-power is everything, and their tactics are marked by a strong tinge of position warfare.

(2) They distribute their forces in great depth.

(3) They neglect the power of cold steel (i.e., sword and bayonet).

(4) Their flanks and rear are particularly sensitive. It is said that many times, even when only small units or patrols are on their flanks or in their rear, they have lost calmness of command [literal translation] and their actions have been hampered.

ATTACK

Even though we may say that the enemy is on the offensive, unless they have a complete faith in their material strength, especially their artillery superiority, they have a tendency not to attack. To judge by the enemy's landing on Guadalcanal and his advance to the west in the last 10 days of September, the advance of his first-line units is begun only after considerable pressure has been placed on us by ground strafing by the air force or by the fire of heavy guns. The distance they will advance at one time is limited to the range at which the main artillery force can support them from the rear. Further advance is begun after the artillery is displaced forward and preparations completed. Ordinarily the attacking forces advance during the daytime, accompanied by trench mortars and supported by artillery and aircraft. At night they generally remain at rest in the position where sunset finds them.

There is a tendency for the main body to keep close to both sides of roads and not utilize the jungle, except for small forces and patrols. If they stop and do not move out for a day or two, they construct light wire entanglements.

DEFENSIVE FIGHTING

Although they make it a principle to destroy the enemy in front of the main line of resistance of a defensive position, they also advocate active counterattacks within the positions. [The Japanese principle of defense is to give with the blow, let the attacking enemy become disorganized by his advance, and then counterattack in force.]

In front of and within their positions, they prepare thorough concentrations of firepower, especially that of trench mortars and artillery, and they use ammunition abundantly. Furthermore, in not a few cases, the troops holding the position fell back and then artillery fire was concentrated in the area they had evacuated. Also, artillery fire concentrations are laid down in the jungle in front of the positions. There are units that have received heavy casualties on this account. It seems that they carry out test firing beforehand at each place. [This must mean registration fire. It is amazing to find a remark like this. It shows a remarkable lack of appreciation, on the part of the Japanese, of the capabilities and limitations of artillery. This has been intimated by other sources.]

They install microphones in front of and within positions, and utilize mobile artillery-observation stations to perceive our approach so that fire may be concentrated on our force. The "mikes" are gray in color and of large type, in large leather cases. They are installed at the roots of trees, etc. The wires are black insulated wire.

Their airplanes, particularly fighters, reconnoiter and make bombing and strafing attacks, and act very aggressively. As the fighters carry out their strafing and bombing at low altitudes by diving, there are frequent opportunities

to shoot them down when infantry units can carry out AA firing.

Their forward units sometimes use a successive resistance. [Probably means delaying actions.]

For security to the front of their positions, they send out forces about the size of a platoon and generally avoid posting sentries in small groups, with the result that there are many gaps. The security measures in the position itself are also insufficient, and it often happens during a battle that our patrols stumble upon enemy positions and find AA gun positions, provisions, dumps, etc. On account of their not posting observers in front of the positions, the attackers [i.e., Japanese] sometimes, contrary to what might be expected, suddenly and without warning come in contact with the main position and receive unexpected losses.

Although their counterattacks are not vigorous, they sometimes execute them against our flanks and rear at very short distances in front of their positions. However, they don't use cold steel (bayonets).

NATURE OF DEFENSIVE POSITIONS

Their wire entanglements consist of roof-shaped and net-shaped entanglements, and low wire entanglements, and are constructed over the whole front of the position. Although there are three or four bands of wire at important points, there are also light entanglements of about three strands of barbed wire. Empty cans and so forth are fastened to the wires. Electrically charged wire entanglements have not yet been observed.

Pillboxes are chiefly covered machine-gun positions, and are deployed in depth every 200 or 300 yards along the front. Many log ones have been used, but as yet none of the concrete type have been observed for certain.

At present the enemy is burning back the jungle here and there to clear the field of fire, establishing more covered machine-gun positions, and constructing other installations so the positions will be made increasingly stronger.

WITHDRAWAL TACTICS

Withdrawal from the field is carried out under the protection of the main artillery force. When in a coastal area, they use landing boats a great deal.

NIGHT FIGHTING

They fire actively at night, especially trench mortars, and where preparation has been made, the fire has considerable effect. They almost never make night attacks.

PATROLLING

Extremely few patrols are sent out, and when they execute a reconnaissance mission, it is generally with a platoon or a larger force, and almost like a reconnaissance in force. The afternoon of September 24, about 100 of the enemy appeared in the vicinity of the OKA Force's observation post and ran into some of our people who were cooking. They were scouting in preparation for the advance which the enemy made several days later in the vicinity of the Matanikau River.

They carry out vigorous air reconnaissance. They execute especially thorough strafing and bombing attacks when they spot the smoke of our cooking fires, or when our soldiers are moving in the open.

MISCELLANEOUS

Their tanks traverse almost any kind of terrain; however, their action is independent, and there should be many opportunities to take advantage of this.

Automobiles are used everywhere in large numbers, and are used even off the roads.

POINTS TO NOTE IN OUR COMBAT

(1) 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 firepower support forces. [The composition of these "firepower support forces" is probably battalion and regimental infantry guns, 37-mm antitank guns, mortars, and machine guns: in other words, the infantry heavy weapons. The Japanese have a tendency to neglect proper use of these, placing their dependence on the maneuver and "cold steel."]]

(2) In infantry fighting at close quarters, crawling forward and utilizing dead ground has many advantages.

(3) The terrain of the battlefield is generally hilly; on high ground are mostly grassy plains, and in the low places there is jungle. In the jungle we can conceal our intentions, but it is extremely difficult to maintain direction there, so it is necessary to make careful plans and preparations beforehand, and to gain and maintain complete control of the unit.

(4) It is difficult to determine (in the jungle) where one is and where the objective of the attack is; therefore, it is necessary for commanding officers of all units to have a complete knowledge of the locality, the route of attack, etc.

(5) Effective shelling is often received in the jungle in front of the enemy positions, and there have been cases where this disorganized the ranks and ultimately rendered a charge impossible. The commanding officer must give special attention to the control of his force.

(6) Search out the "mike" positions, and at a predesignated time destroy them simultaneously, taking care to cut the wires.

(7) Since the enemy reacts very quickly to our artillery fire, we should establish artillery positions everywhere, and by utilizing dummy positions, smoke, etc., confuse the enemy and make him waste his shells. In not a few cases, the skillful establishment of false positions at the front and flanks of important points occupied by the infantry in the face of the enemy has been attended with great success.

(8) While preparing the attack, full attention should be given to the supply and concentration of ammunition, provisions, water, and so forth.

(9) If we close with their firepower [Translator's note: This phrase may also be translated "closely allied with firepower."], our cold steel still has a decisive force and the enemy fears it greatly.

(10) Considering the difficulties of the terrain, unusual amounts of exertion and time must be expended in the preparation for the attack.

(11) As the health situation is not good, the men must not be allowed to catch cold while they sleep.

(12) In case you stay rather long in one place, air-raid trenches must be dug, without fail. If the earthworks are completed, any sort of concentrated fire, or bombing, can be withstood without great loss.

(13) During the day, smoke from cooking fires is absolutely forbidden. In case of cooking at night, you must not allow firelight to show.

CONCLUSION

To sum up, the enemy's military preparations may be said to be built on a framework of a materialistically organized firepower, with the benefits of air activity added. They are never seen to maintain any particular fighting power, and although they are at present exerting themselves in the extreme and strengthening their positions, if we make especially thorough preparations, prepare our fighting strength to deal hammerlike blows against the enemy, concentrate on using all sorts of original plans, and carry them out with a flourishing aggressive spirit, our success in the present operation is certainly beyond doubt.

CORRECTIONS

ENGINEERS

No. 18, p. 12: The article beginning on this page was entitled "Italian Variable-Pressure Mine." It is now reported that this is a Hungarian mine; at least some of these are manufactured for the Axis in Czechoslovakia.

SIGNAL CORPS

No. 19, p. 44: In sub-paragraph (1), it was stated, with reference to signal security, that "the enemy found it impossible to predict a certain attack from an examination of requests for supplies." The word "impossible" should read "possible."