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SECTION I

AIR

1. EVASIVE TACTICS OF GERMAN LEVEL BOMBERS

Evasive action, as employed by German Air Force level bombers, may be divided into two categories. One includes all maneuvers made as a matter of normal routine; the other applies to action taken when the presence of enemy aircraft is detected.

The first type of action consists of flying a weaving course in azimuth and simultaneously changing altitude by as much as 500 feet above and below the mean. Occasionally, an orbit or complete circle is made as a further safeguard and may be repeated as often as the pilot considers necessary. This circle is often effective in preventing the successful completion of a ground-controlled interception, and has the added advantage of being easy to carry out while making good a track to the target.

The second type of evasive action is of a much more violent nature. On the approach of intercepting aircraft, it is not unusual for a bomber pilot to quarter-roll his plane, applying full bottom rudder. The resulting dive is very steep, especially if the stick is pulled back hard immediately before the quarter roll. The bombers frequently pull out of this maneuver as low as 2,000 feet.

However, it appears to be beyond the capabilities of the majority of German pilots to carry out evasive tactics irregularly and still make good a mean track to the target. The result is that evasive tactics are used in a comparatively regular manner which the ground control stations are able to follow and sometimes even to predict.

Different tactics are employed in avoiding or escaping searchlights, but the most common evasive action consists of gliding through a known searchlight belt at high altitudes with throttles closed, so that the sound locators for the searchlight and antiaircraft batteries are unable to detect the aircraft.

Enemy aircraft, when picked up by searchlights in night combat, have attempted to deceive the ground defenses by turning away from the beam and immediately returning from another quarter with navigation lights on.

The bombers take effective evasive action on their approach to, and get-away from, a target by desynchronizing the engines and constantly altering the throttle settings. This action upsets the normal action of the detectors and makes difficult an accurate prediction of the plane's course.

2. JAPANESE RUSE - A DECOY SHIP

The use of dummy positions, installations, etc. presents nothing new in principle. When properly used, however, they can offer considerable protection against bombing attacks if not disclosed by close study of air photos and careful direct observation.

An effective example of the principle here involved has, at least in one instance, been used by the Japanese. A Japanese supply ship, in the harbor of an island captured by them, was beached (or anchored very close to the beach). She was repeatedly attacked by United States planes and remained in the same position for an extended period of time, apparently so badly damaged as to be unable to put out to sea. In a subsequent attack on this harbor, our planes observed two ships, one in the old position near the beach, and what appeared to be a newly arrived ship farther out in the harbor. The planes bombed and hit the ship out in the harbor. The wrong ship was attacked.

When the planes returned to their base, air photos taken during the mission were studied. They showed that the old damaged ship was the one out in the harbor; its former position near the beach had been occupied by the newly arrived ship. Except for the bridges, both ships were practically identical in general appearance and size. Barges were located alongside the damaged vessel in its new position, but careful scrutiny showed its hatches to be covered. The new ship had no barges alongside, yet it was noted that its open hatches disclosed a partially unloaded cargo.

It is obvious that the intention was to protect the newly arrived ship by making it appear to be the old damaged vessel. The ruse was at least partially successful in that the enemy gained valuable time in which to unload the new ship.

3. SALVAGE OF CAPTURED AIRCRAFT BY THE GERMAN AIR FORCE

War is the best testing ground for all types of fighting materiel, and this is particularly true of aircraft and their equipment. The Italian conquest of Ethiopia, the Spanish Civil War, and the Sino-Japanese conflict have all provided excellent laboratories for experiment in the design and performance of combat planes.

In the present war, air power has played, and will continue to play, such an important role, that all belligerents are constantly engaged in improving their planes. Construction, speed, maneuverability, range, ceiling, armor, and fire power of aircraft are subject to daily study and change. Since World War I, the character and scope of air warfare has been revolutionized, necessitating vast improvements in design and construction. Nations have approached this problem from different angles with varying results. During peacetime, efforts were made--particularly by the Axis countries--to guard their most important air secrets from potentially hostile powers, although certain revelations could not be avoided when the aircraft were tested in actual battle experience such as the Spanish Civil War.

With the outbreak of World War II, it became vitally important for each belligerent to acquire as complete information as possible with respect to its opponents' planes in order to have the technical knowledge with which to combat them. The Germans were very late in recognizing the importance of information

to be obtained from captured planes and equipment. Their plans for a lightning war did not envisage the necessity for keeping up with their opponent's technical developments. The Battle of Britain was the beginning of the lesson that showed them their error, but it was not until 6 months or so later that a formalized procedure for the salvage and examination of crashed and captured enemy aircraft began to be put into effect.

Every officer of the German Air Force who sees an enemy airplane shot down, force land, or crash in his vicinity, is required to report the incident immediately by telephone to the Air Liaison Officer at Division Headquarters, who in turn forwards the information through channels to the Luftgaukommando (German air corps district headquarters). The observing officer can telephone direct to the Luftgaukommando if such communication is available. A German Air Force officer will convey the necessary information by Air Despatch Letter Service. The report must include identity of reporting unit and of the guard furnished, the location, nationality, and condition of the aircraft, and the location of the crew.

The task of salvage is delegated by the Luftgaukommando usually to the commanding officer of the airdrome area nearest to the location of the plane; he dispatches a first salvage detachment by car. This detachment consists of an officer, a technician, a photographer, and one member of each of the communications and ordnance staffs.

At the scene of the crash, photographs are taken immediately, and the negatives sent to the Luftgaukommando photo section for examination. A preliminary technical report is then prepared for transmission to, and evaluation by, Luftgaukommando Intelligence. This report should contain a description of the plane, including data as to its position, special characteristics, construction, armament and equipment, performance, and purpose. All tactical material and personal documents of the crew should accompany the report.

The member of the technical staff with the detachment will then request a salvage squad from the airdrome to complete the salvage, and this squad will include an engine specialist and additional special personnel. Salvage operations by Army or Air Force Troops are never permitted. Their duty is merely to guard the plane until the arrival of the salvage squad in order to prevent removal of any parts for souvenirs or other purposes.

The flying equipment is salvaged into two groups, signal and flight data being segregated from technical material. All salvaged material is conveyed to the main Air Force station in the area, and from there to the Air Force branch concerned, except that radio equipment is dispatched via the Luftgaukommando to the Chief Signal Officer, Air Ministry.

Reports by the airdrome authorities responsible for the salvage operation must immediately be made by telephone or radio to the Air Ministry and Air Staff Intelligence of the Air Force High Command in case of the signal equipment,

and to the Chief Equipment Officer on the technical material. Other detailed written reports on the salvage operation, and on the plane and its equipment, are made respectively to the Luftgaukommando and the Chief Signal Officer.

If there is any danger of the aircraft catching fire or being "shot up" by the enemy, all possible efforts must be made immediately to salvage equipment--particularly photographic equipment, maps, and documents,--and to transmit the same to the responsible officer, together with a description of the plane from which they were taken, and the precise time and place of crash.

The crew will be made prisoners of war, segregated, interrogated, and disposed of in the usual manner. Any documents in their possession are sent to Luftgaukommando Intelligence immediately.

ANTIAIRCRAFT

4. GERMAN SIX-GUN HEAVY ANTIAIRCRAFT BATTERIES

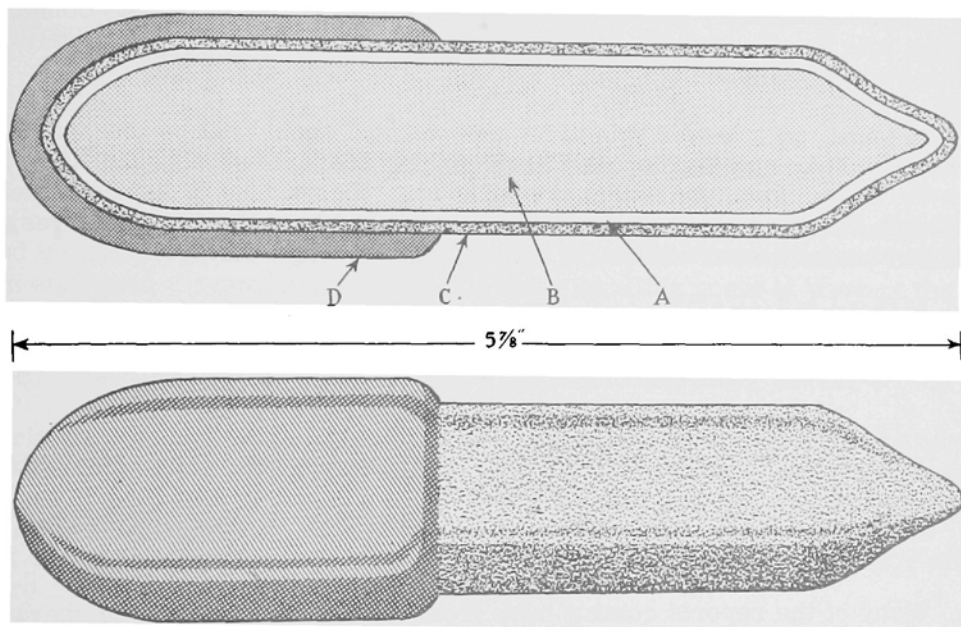
There is evidence indicating that at least some German heavy antiaircraft batteries have been organized on a six-gun basis instead of the usual four guns. There are indications that in North Africa this change had been effected to a large extent some time ago. In one instance the equipment of a heavy anti-aircraft battery in North Africa is reported to have included six 88-mm guns and two 20-mm guns. There were also 62 vehicles, among which were 9 motorcycles, 20 medium trucks, 8 tractors, and 11 trailers.

CHEMICAL WARFARE

5. INCENDIARY CAPSULES

An incendiary capsule was found in a ship which was set on fire on April 23, 1942. The accompanying sketch is a full-scale drawing of the object.

SECTION



EXTERIOR VIEW

A is a flexible, gelatine capsule, yellow and translucent, containing a highly volatile fluid B. The outer surface C is covered with a sticky, black, carbon or graphite compound. D is a hard, brown casing, covering one-half of the capsule. This appears to be a magnesium compound and burns fiercely when ignited.

The capsule is ignited by heat, a test showing that it became active when placed in the sun, even when covered by a sheet of corrugated iron. It would seem, therefore, that no very high temperature is required to cause the device to function.

There is obvious danger that these capsules may be slipped into aircraft, motor vehicles, supplies, buildings, or any vital place where the sun's rays or artificial heat may ignite them.

6. INCENDIARY LEAVES

It has been reported that incendiary disks, 9 inches in diameter and having the appearance of yellow crepe rubber, have been found on the east coast of England. They appear to have been dropped by enemy aircraft, and are probably intended to set fire to crops and woods.

These incendiary leaves are thought to contain a phosphorous compound, and burst into flame when dry. There is no risk of explosion if only small quantities are present.

If found, such leaves should be kept wet and should not be touched with bare hands. They may be disposed of by placing them, in small quantities, in a fire in the open. When the leaves are picked up, the residue of inflammable material on the ground may cause a fire after it has become dry. Such residue should be carefully watched until it is completely burned out.

It is dangerous to dispose of the leaves by throwing them into inland waters or the sea, since there is always the possibility that they may be washed up on to vulnerable objectives.

ENGINEERS

7. JAPANESE CAMOUFLAGE

Many of the reports coming back from the various theaters of operation have stressed the excellence of Japanese camouflage (see Tactical and Technical Trends, No. 14, p. 16). It appears that they adapt the type of camouflage employed to suit the country in which they are operating, rather than relying upon any set principles or stereotyped pattern. As it is evident that much importance is attached to this subject, a selection of topics in these reports is given below.

* * *

a. A British officer's report states that the Japanese are excellent at camouflage, and use the chameleon principle. Whatever type of country was being traversed, their style was altered, in that different colored vines or branches, to correspond with local vegetation, were fastened to their persons. Thus, lying along branches or standing against bushes, they were absorbed into the landscape.

b. A dead sniper who was examined carried the following camouflage equipment: a green net for his helmet; a pair of long green gloves; a bottle of green liquid with which his face and rifle were smeared; and a small hypodermic syringe. This syringe was empty when examined, and there was no indication of its contents.

c. According to another report, Japanese snipers have packs in which a number of differently colored gymshirts are carried. They change these shirts

according to the color of the cover from which they are operating. They also have face nets, which are of various colors, and like the gymshirts, are changed according to the nature of the cover.

The report also states that camouflaged elephants had been seen. Their hides had been painted with large patches of different shades of green to tone in with their surroundings.

8. ITALIAN MINEFIELDS IN NORTH AFRICA

In order for obstacles to be effective, they must be covered by small-arms fire, and if extensive, also by artillery fire. In North Africa the Italian Trieste Division employed a system of observation and signalling posts to prevent the British from clearing gaps in the minefields. These posts, armed with light machine guns, are manned from dusk to dawn, with at least two men on duty at all times. They are located both inside the minefield and along the far edge.

Prisoners of war stated that, "mines were always laid about 1 yard apart, except when the supply was inadequate in which case they were laid either haphazardly or from 2 to 4 yards apart." It is thought that reference is here made to a density of one mine per yard of front, since if the mines were spaced as close as one yard apart the explosion of a single mine would probably touch off the entire minefield by sympathetic detonation.

Much difficulty appears to have been experienced by the enemy in the marking of minefields. Various methods have been reported. One method, which is believed not to have been heretofore reported, is to use a system of wooden stakes: high stakes to mark the near edge, short stakes to mark the far edge and flanks.

9. THREE NEW GERMAN IGNITERS

Three new German igniters have been reported. While there is no evidence that these igniters have been adopted by the German Army, they may be in the near future. It appears that the following descriptions may not be accurate in every detail; however, they are sufficiently accurate to permit recognition of the igniters should they make their appearance.

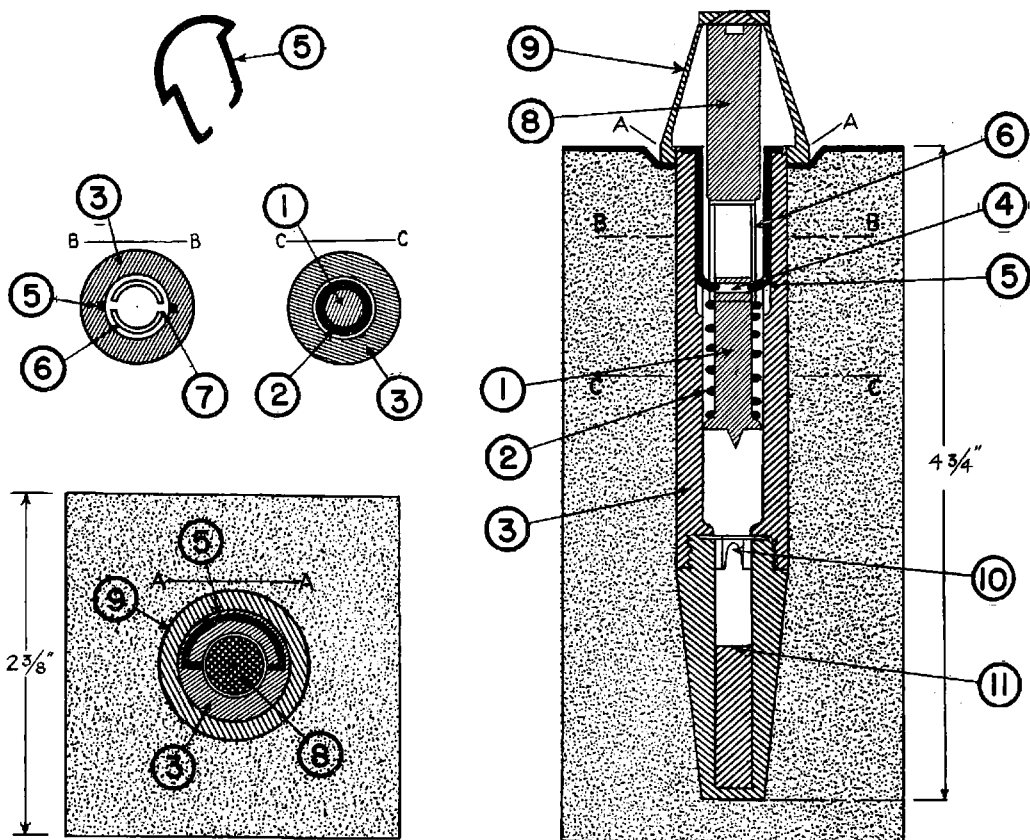
a. Reinhard Igniter

This igniter is illustrated in sketch No. 1. It consists of a striker (1)

with a spring (2) contained in a casing (3). The top end of the striker is provided with a cavity (4), probably a cylindrical hole passing through the striker. This cavity is gripped by the turned-in ends of two arms of a piece of spring steel (5), and the striker (1) is thereby held in place in the assembly. Above the striker is a sleeve (6), which is provided with two diametrically opposite longitudinal slots (7), in which slide the turned-in ends of the arms (5). Above the sleeve (6) is the main pressure bolt (8), which is kept in position by a retaining cap (9), the exact construction of which is not definitely known. Below the striker is the percussion cap (10) and a detonator (11).

When pressure is applied and the bolt (8) depressed, the sleeve (6) is forced down and compresses the spring (2). The striker is then spring-loaded but still held in place by the turned-in ends of the arms (5) in the striker cavity (4). When the lower end of the bolt (8) comes into contact with the turned-in ends of the arms (5), it forces them slightly apart and frees the striker (1), which, forced down by the spring, fires the cap (10) and the detonator (11).

SKETCH NO. I



REINHARD IGNITER

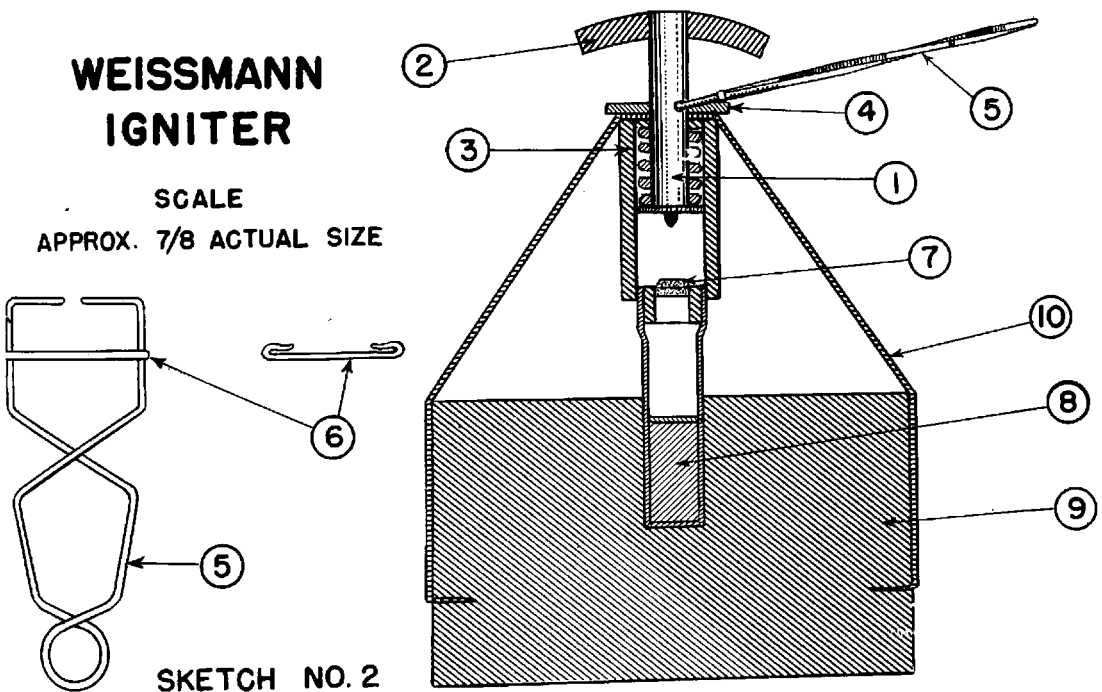
b. Weissmann Igniter

This igniter is illustrated in sketch No. 2. It is designed to be used either as a push-igniter for improvised mines, etc., or as an impact igniter for HE charge when used in the assault. It consists of a spring-loaded striker bolt (1), at the top of which is a curved pressure head (2). The bolt is held against this spring (3) by a small glass rod (4), diameter 1.2 mm (0.05 in), which passes through a hole in the bolt, and by a safety device (5), consisting of a small pair of tongs, the turned-in ends of which fit into another hole in the bolt and are kept in position by a small spring clip (6). In the base of the igniter is a percussion cap (7) and a short detonator (8). The igniter and detonator assembly are secured to the HE charge (9) by a thin metal cramp (10).

In operation, it is assumed that the safety tongs (5) are removed by withdrawing the clip (6). Pressure or a blow on the head (2) will then shatter the glass rod (4) and allow the spring to drive the bolt on to the cap (7).

**WEISSMANN
IGNITER**

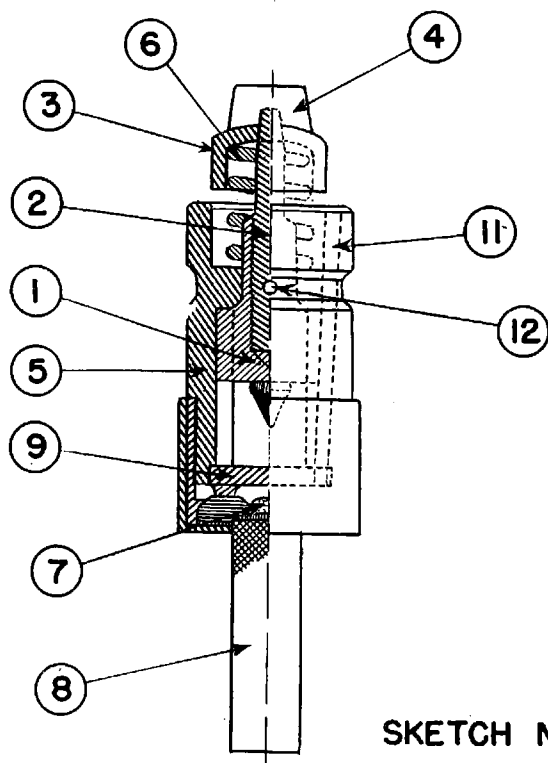
SCALE
APPROX. 7/8 ACTUAL SIZE



c. PX32 Igniter

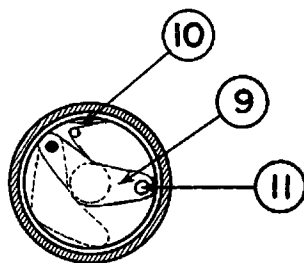
This igniter is illustrated in sketch No. 3. Like the Weissmann Igniter, it can be used either as a push-igniter in improvised mines or as an impact igniter. It consists of a striker bolt (1), which is apparently made in two portions, the inner component (2) supporting at its top end the hollow pressure cap (3), on the top of which is a small metal vane (4). The bolt is contained in a stout casing (5), and is normally kept in the positions shown in the sketch by the spring (6). In the base of the igniter is a percussion cap (7) and a detonator (8). Above the percussion cap is a safety device consisting of a small wing-shaped plate (9), pivoted at one end. When in the safety position, this plate is kept in the position shown in the sketch, against the action of a small spring (10), by a vertical safety pin (11) which is inserted from the top of the igniter and passes through a small hole in the free end of the plate (9). When in the position shown, the plate (9) forms a guard between the bolt (1) and the cap (7). On withdrawal of the safety pin (11) the plate (9) is forced over to the position shown dotted, and the bolt (1) has access to the cap (7). A further safety device is provided by a pin which passes through the horizontal hole (12).

It is assumed that both pins (11) and (12) are withdrawn before use. Pressure or a blow on the cap (3) will then force the striker bolt on to cap (7).



PX 32 IGNITER

SCALE
ACTUAL SIZE



SKETCH NO. 3

INFANTRY

10. LESSONS FROM GERMAN INFANTRY OPERATIONS

The following report is an extract from the translation of a German Army High Command memorandum issued on December 18, 1940.

* * *

a. Reconnaissance

(1) The principal reason for failure of a reconnaissance is the desire of commanders to push forward the attack. As long as the situation on both sides remains fluid, this is justified. In such cases, the best opportunity to attack will be lost if the results of reconnaissance are too long awaited. When an attack is launched against an enemy who is organized for defense, the time taken to prepare the attack is also advantageous to the defender. Commanders must therefore do their utmost to secure speed. However, the preparation of an attack demands time, which must be allowed if unnecessary losses and set-backs are to be avoided. This time must be thoroughly used for reconnaissance.

(2) The employment of over-weak patrols is partly due to previous teaching. For example, in our Infantry Training Manual, it is stated that "a few resolute men" suffice, and then again that "the minimum strength is generally a commander and two men". Almost all patrols in peacetime exercises were of this strength.

It is also the result of the attempt of company and platoon commanders to keep their troops together, and avoid weakening them prematurely. Experience shows that only combat patrols can carry out reconnaissance against an enemy organized for defense. Patrols formed of from one to two squads under the leadership of a platoon commander and supported by mortars and machine guns have proved successful. The squad is also the most self-contained unit for this purpose and, with four squads to a platoon, one that is always available.

b. Assault Detachments

(1) Formations in Approach and Attack

To secure superiority for the fire power of a rifle company, a large number of machine guns must be employed in the front line. In many cases troops were formed according to their departure from the assembly position, and retained this formation throughout the approach although the time to adopt battle formations had not yet arrived.

(2) Arrowhead Formations

The usual method of attack against a permanent position is to force a breakthrough in arrowhead formation with a strong spearhead. The objective of the arrowhead is the enemy's weak point, "wherever the tactical situation and ground offer the best chance of pushing home the attack swiftly." The strength and composition of the formation of the advancing company depend on cover for the approach, fire support, and the breadth of the objective.

All available heavy weapons, including those of reserve troops, should be brought up to lay down a concentration of fire in conjunction with the advance of the assaulting force.

Reserves are also brought up to the point of penetration. They approach the battle with assault and fire, keep the situation fluid, and extend the breach on either side.

It can thus be seen that the arrowhead formation is a development of the theory of concentration. The most important factor is not the formation of the company or battalion, but the coordination of all forces, assault, fire power, and reserves, against the chosen objective.

It is the duty of the tactical commander to decide how the sectors of the enemy position not directly assaulted are dealt with. If a battalion advances against its objective in arrowhead formation, with one rifle company forward, the stronger sectors of the enemy positions on the flanks are not at once engaged. The enemy can therefore often bring down unhindered enfilading fire upon the head of the attack. The fire of heavy weapons and of artillery will not usually suffice to neutralize these sectors. They can only be efficiently neutralized by direct attack. Hence the arrowhead must be extended to the flanks by the employment of patrols of fighting strength to attack the flanking position. The company forming the arrowhead, and the battalion, must be organized with this in mind.

(3) Concentration of Fire for Advance

Many reports emphasize the advantage of concentrated fire. There is nothing new in this. Battalion commanders should coordinate fire according to the tactical conditions. Stereotyped fire plans should be avoided.

Concentration of fire requires careful preparation. If all firing is forbidden during the preparation, the initiative, and therefore the spirit, of the junior officers is lowered. Even during the preparation, every company, and even every platoon, should exploit any opportunity of pressing forward, and even provide the needed impulse by concentration of fire.

Strong emphasis should be laid on the importance of careful timing of fire and movement. The combined fire of heavy weapons and artillery must coincide with the advance of infantry. It is the task of the battalion commander and all commanders of heavy weapons to push the advance steadily forward by means of concentration of fire. It is the task of all commanders and junior officers of rifle companies to bring up their men and push on as long as fire continues. The key to success lies in advancing under cover of friendly fire.

Both the concentration of fire and the advance under its cover must be practiced as a drill.

(4) Concentration of Fire--Heavy Weapons of Reserve Units

Fire is concentrated on the point of penetration. All heavy weapons must prepare to combine fire on targets which obstruct the line of advance, and after that on the objective. The battalion commander orders the exact time at which the fire is to be concentrated, in accordance with the considerations discussed above. The regimental commander increases the concentration, where possible, by employing the heavy weapons of the reserve battalions as well as by appropriate cooperation with the artillery.

c. Fighting in Woods

An attack through thickly wooded country imposes special battle tasks on commanders and troops. It demands careful preparation and timing.

Quick successes can be won by good observation, cunning, and surprise attacks. When the enemy is encountered suddenly, he must be attacked with the bayonet immediately.

In large, thick woods, with heavy undergrowth, reconnaissance patrols of fighting strength must be sent out to force the enemy to open fire and disclose the whereabouts of his well-camouflaged positions.

The spearhead of the attack, which follows the reconnaissance element, must be liberally equipped with close-combat weapons, automatic pistols, and if there is thick undergrowth, with axes. Single heavy weapons, and antitank and infantry guns are brought up close behind the leading elements to clean out weak centers of resistance from clearings and paths. Strong centers of resistance should be passed by, and left to the following units. If this is impossible, they must be carefully reconnoitered and assaulted with the support of heavy weapons.

Loud cheering and the sounding of the "Charge!" when assaulting troops break through confuse the enemy and facilitate cooperation between friendly troops.

The foremost attacking parties penetrate the enemy position in arrow-head formations. They are followed, at distances determined by the ground and the tactical situation, by rifle companies which comb the woods and clean up the ground captured.

Protection must be secured for the flanks.

Snipers in trees can be dealt with effectively by raking the tree-tops with machine-gun fire.

* * *

/s/ von Brauchitsch

11. GERMAN ATTACKS ON PERMANENT DEFENSES

The following German method of attack on permanent fortifications was observed in Russia; the steps were—

- (a) Heavy dive-bomber attack on the Soviet artillery;
- (b) Selection of two or three front-line pillboxes which were subjected to terrific box barrage;
- (c) Under cover of barrage, a small party of storm troops crawls up and either attacks the embrasures with flame throwers, or attacks with small, accurate, antitank guns, which put shell after shell into the same hole;
- (d) When the selected pillbox has been captured, infantry advances, and occupies the position.

It is interesting to compare the above with the method employed against the Maginot Line:

- (a) Casemates were subjected to 2 hours' heavy artillery fire followed by dive-bombing attacks for 20 minutes;
- (b) Special engineer assault detachments, under cover of antitank, machine, and infantry guns, advanced and threw explosive charges into the embrasures;
- (c) Smoke grenades were used to protect the assault troops from enfilade fire;
- (d) Infantry advanced as soon as the casemates were captured.

The above methods are in keeping with the normal German practice of concentrating the maximum effort at one point with the object of effecting a breakthrough.

12. STEREOTYPED ATTACK TACTICS IN THE MIDDLE EAST

A study of the tactics employed by the Germans in the Middle East, when approaching a prepared position, shows that they have developed a stereotyped form for these attacks.

Initial contact is made by armored cars operating on a wide front. These cars operate in groups of two or three, and, if seriously opposed, turn back. The cars are followed by mixed columns of tanks and motorized infantry, the former usually leading. After the armored cars have made contact, an aggressive reconnaissance is carried out by tanks, which, if successful, are followed by the motorized infantry. A full-scale attack is then developed. If the tanks are driven off, a pause follows while a more detailed reconnaissance is carried out. On the results of this reconnaissance the plan is drawn up.

A German attack is generally launched against that part of the defense system which is nearest the principal objective. Only that part of the front which is to be attacked is subjected to careful reconnaissance, the remainder being either ignored or only superficially reconnoitered. A careful watch on the con-

duct of this reconnaissance will, therefore, give a very accurate idea where the attack will strike. The plan of attack is worked out in great detail, full consideration being given to such factors as concealment and surprise. Surprise is obtained not by attempting to hide the imminence of the attack, but by concealing from the defender its extent and scope. For example, the forward movement to the assembly area is frequently carried out with the evening sun in the eyes of the defender, and the actual attack launched at dawn or by the light of the moon.

The attack is preceded by heavy air bombardment of known gun positions. Tanks then move forward in the fading light, covered by mortar fire and supported by dive-bombing attacks on the forward positions, and establish themselves in front of the obstacle covering the forward areas. Engineer units pass through the tanks under cover of darkness, and remove the obstacles either by lifting the mines, or by forming gaps in the ditch. At the same time a machine-gun battalion is brought up and established in line with the leading tanks. At daylight, or in moonlight, the German infantry attacks the forward areas, with tanks moving in support. When visibility permits, the tanks either advance in mass formation with the object of breaking through the gun positions and other vital points of the defense, or they assist the infantry in systematically mopping up defended points. In the latter role, the methods employed include flame-throwers, direct thrusts at machine-gun nests and throwing bombs into trenches.

Whenever such an attack has failed, especially when the tanks have passed through the forward areas to attack gun positions, it has always proved extremely costly to the Germans.

From the above, the following conclusions may be drawn:

(a) The points most liable to attack are those nearest a vital objective which have good tank country in front of them;

(b) Forward areas of resistance should be sited to cover any defiladed ground which could be used by the enemy as an assembly area;

(c) Forward areas should be sufficiently protected by obstacles to prevent their being over-run by tanks, or by infantry at night. Adequate protection against dive-bombing in the form of slit trenches should be prepared, and anti-aircraft fire should be coordinated. Areas of resistance should be self-supporting for a sufficient time to ensure the defeat of the tank attack and the subsequent restoration of the situation by counterattack.

(d) Gun positions should, where possible, be protected by a tank obstacle at such a distance in front that they cannot come under pointblank machine-gun fire from the enemy tanks.

(e) The principal object of the defender should be to separate the enemy tanks from the supporting infantry.

13. OCCUPATION OF A POSITION AT NIGHT

The importance of preliminary reconnaissance in the occupation of a position at night is clearly shown in the following account of the destruction of a German infantry battalion in Libya last June.

The battalion (with only two companies, the 9th and 10th) arrived at a new position at 0230, and began at once to dig in, leaving a space of about 500 yards between the two companies for the 11th Company, which was to come up later. No reconnaissance of the area was carried out "because of the darkness of the night." When dawn came the battalion commander immediately became aware that the company positions were completely dominated by those of the enemy. The two companies in fact found themselves in very close contact with British positions; the Germans' field of fire was limited to a few yards, and they were completely overlooked from the front, the left flank, and the rear. The space left clear for the 11th Company was found to be occupied by a knoll which prevented visual communication between the two companies.

The British immediately opened up an intensive fire of all weapons, which prevented the withdrawal of the battalion and cut the telephone communications. They followed this up by sending out tanks and armored cars which outflanked and overran the 9th Company. The artillery in support of the 9th Company tried to lay down defensive fire, but was in a low position from which it was unable to bring direct fire to bear, and was neutralized by British counter-battery fire.

The British artillery was then concentrated on the 10th Company. When the dust and smoke thrown up by the artillery fire had subsided, the company found about 20 tanks and armored cars on top of it, their fire completely nullifying the weak counterfire from the position. The commander of an antitank gun, who managed to get off a few rounds, was heard shouting to his company commander that the armor-piercing shells were bouncing off the tanks. Thus the 10th Company was overrun.

British armor then advanced on the battery position, capturing the Adjutant (who was wounded), other officers of the battalion headquarters, some men, and the few artillerymen who had stayed with their guns. Only a few appear to have escaped.

The Germans attributed their destruction to:

- (a) Lack of day reconnaissance of the position to be occupied;
- (b) Lack of information about the British positions;
- (c) Absence of the 11th Company, which prevented the formation of a position in depth or any system of visual signals between the two forward companies;
- (d) Extreme fatigue of both officers and men;
- (e) Lack of artillery support;
- (f) Overwhelming enemy superiority in artillery and armor used in close cooperation.

It was therefore concluded that infantry should not be used in open ground against armor unless strongly supported by artillery, so sited as to be able to use direct fire against enemy armor approaching from any direction; nor should infantry be used without the support of armored vehicles.

14. ANNUAL BASE PAY--JAPANESE ARMY

<u>Grade</u>	<u>Annual Base Pay</u>	<u>Grade</u>	<u>Annual Base Pay</u>
General	\$1,914.00	1st Lieutenant	
Lt. General	1,682.00	1st Class	\$327.70
Major General	1,450.00	2d Class	295.80
Colonel	1,305.00	2d Lieutenant	246.50
Lt. Colonel	933.80	Warrant Officer	261.00 to 278.40
Major	675.70	Sergeant Major	104.40 to 135.72
Captain		Sergeant	46.98 to 78.30
1st Class	551.00	Corporal	31.32 to 53.94
2d Class	478.50	Superior Private	22.27 to 24.36
3d Class	426.30	1st & 2d Class Privates	19.14

Comment: The U.S. dollar has about 4 times greater purchasing power in Japan than in the United States. Note the great difference between the pay of enlisted personnel from sergeant down and that of commissioned personnel-in particular that the pay of a general is exactly 100 times that of a private.

15. SKI PATROLS OF THE SOVIET ARMY

The following description of the operations of ski detachments is taken from the Soviet Military Manual of Winter Operations.

Although this report concerns ski patrols, it is felt that much of the training and technique involved is applicable to raiding parties generally.

a. General

Ski detachments generally operate in the enemy's rear. Existence of gaps in enemy positions, broken ground, and wooded country favor infiltration of ski detachments to the rear of the enemy.

The following tasks are assigned to these detachments:

- (1) Destruction of enemy personnel and materiel;
- (2) Destruction of enemy staffs and command posts;
- (3) Destruction of enemy communications and transport, and the

burning of depots and bases;

(4) Destruction of planes on airfields, and demolition of road and railway bridges;

(5) The capture and holding of an important objective in the rear of the enemy, for the purpose of impeding his retreat and the bringing up of his reserves.

b. Personnel of Ski Detachments

The composition and strength of a ski detachment will depend on the nature of the task, distance to the objective, length of fighting operations, likelihood of meeting the enemy, availability of air support, and the support of the ground forces. In any case ski formations must possess great mobility, and should be capable of functioning off roads and without contact with friendly forces for several days at a time.

Skiers must be exceptional men. To carry out their tasks successfully, ski troops must possess the following qualities: excellent training, great courage and initiative, excellent physique, powers of endurance, ability to find their way easily in any locality at any time of day or night and in any weather, and ability to use skis expertly.

Each skier must have great determination, must be almost foolhardy, be vigorous and yet careful, quick of movement, sharp-sighted, patient, and expert in the art of concealment. He must never, under any conditions, get lost.

All ski personnel should:

(1) Be well versed in demolitions and know how to deal with enemy mines;

(2) Know how to use every means of communication, and be able to communicate with friendly troops;

(3) Be adept at first aid, and able to apply it on the field of battle;

(4) Be experienced in constructing shelters out of any materials at hand.

c. Equipment

A ski detachment must be thoroughly equipped for independent action when out of contact with its own troops for several days at a time. Skiers must be warmly equipped and carry light automatic weapons and knives. Every form of fighting equipment, rations, and supplies, including means of evacuating wounded, must be mounted on skis and sleds. It is the duty of every rifleman on skis to carry his individual rations, arms, and ammunition. Ammunition for automatic weapons and mortars, explosives, and incendiary materials are carried on ski mountings. Operations under conditions of constant frost, and nights spent in the open demand that clothing and footwear should be in perfect condition. This should be a subject of constant attention by all commanders. A sufficient number of spare socks should be provided. The regulation Red Army tent must always accompany all personnel. Ski detachments must be provided with spare skis, harnesses and poles, depending on the length of operations and on

whether the ground is broken or not.

Food must be carried in a form which, while taking up the least space, has high food value and can be quickly prepared. These requirements are best met by canned products and food concentrates. Whenever possible, thermos bottles should be filled with a hot drink and all personnel should be supplied with hot-water bottles.

d. Sick and Wounded

Not a single wounded or sick man must be left to the enemy. For evacuation, the wounded and sick of ski detachments must be transported on special ski mountings and sleds. In exceptional cases one may transport wounded by tying skis together.

e. Communications

Communication between the ski detachments and their headquarters is carried out by the use of planes and sometimes by radio. Radio codes in air-ground communication must be established beforehand, and given to the commander of the ski detachment when he is assigned his mission. The periods for radio communication should be also arranged in advance. The fact that the use of radio discloses one's location to the enemy should be kept in mind and, therefore, the periods for use of radio should be arranged to coincide with an anticipated change of location.

The routes and areas of operations of a ski detachment should be studied by its commander in conjunction with the pilots of aircraft who will be detailed for communication purposes.

f. Tactics

(1) General

A ski detachment should:

- (a) Avoid battle until the objective is reached;
- (b) Destroy small groups of the enemy which may hinder the attainment of the main objective;
- (c) Constantly and stealthily reconnoiter;
- (d) Be able to estimate the situation quickly, and avoid battle when conditions are unfavorable;
- (e) Always provide for all-around protection, whether at rest or on the move.

The attempt to penetrate to the rear of the enemy should be carried out by night, in fog, or during heavy snowfall, and contact with enemy detachments should be avoided.

Where, in order to reach the objective in his rear, it is impossible to avoid meeting the enemy, the basis of success is sudden, overpowering concentration of fire power and swift attack.

Surprise is best achieved by taking advantage of poor visibility at night and during snowfall.

Ambushes should be widely used by ski detachments.

(2) Combat

A ski detachment engages the enemy:

- (a) If surprised on the march by the enemy, and it is impossible to avoid battle;
- (b) When it is impossible to attain the main objective without destroying the intervening enemy;
- (c) When the enemy, having discovered the ski detachment, is attempting to surround and destroy it.

Success in battle depends on the initiative, determination, and aggressiveness of every commander and every soldier.

Each man and every platoon should be prepared, on receipt of the commander's signal, to break contact and make their way to a prearranged rendezvous by using cover of darkness and every form of concealment offered. If a ski detachment unexpectedly meets the enemy and there is no chance of avoiding action, the commander should attack with the full force of his fire power in an attempt either to destroy or to force a retreat.

At the same time, the commander must ensure that the attainment of the main objective is not lost sight of.

As a rule the attack should be carried out simultaneously on all sides, cutting off the enemy's retreat. Before the attack, telephone wires leading out of the enemy's position should be cut. Not a single enemy should be allowed to escape to communicate the news of the attack to enemy commands.

After breaking into the enemy position, ski troops should attempt a rapid decision by the fire of weapons, by hand grenades, and with the bayonet. As soon as the task is completed, a ski detachment should move as far away from the objective as possible. If the attack is unsuccessful, the detachment should retire as rapidly as possible to avoid being surrounded.

When the objective has to be held the commander of the ski detachment must:

- (a) Send reconnaissance parties ahead in the more important directions;

(b) Organize an all-around defense at a distance to insure effective support by the weapons of the main force;

(c) Defense must be organized with a view to the employment of automatic weapons, so that the bulk of the personnel can be used as a striking force;

(d) There should be economy in the use of ammunition, and snipers should be employed as much as possible against single targets or small groups of the enemy;

(e) Report back the situation immediately.

g. Security, Reconnaissance, and Movements

Security elements of a ski detachment should be particularly well organized and alert. Sentries must be frequently checked at night.

It must be realized that any relaxation in security measures in the rear of the enemy may be very costly and, therefore, all security patrols should be in a constant state of readiness, with their weapons close at hand for use at any moment.

Reconnaissance by a group of battalion strength should be assigned only to the main objective. Rifle companies may be used for secondary tasks and platoons employed for reconnaissance patrols. Detachments up to a company in strength carry out reconnaissance by the use of patrols.

If the attainment of the objective makes unavoidable a move by day under conditions of good visibility, the commander should exercise particular care in selecting a well-concealed route. A route thus selected should be checked by air observation if possible.

Movement of ski detachments in the rear of the enemy as a rule should be carried out cross-country, avoiding the use of roads; special attention should be paid to preliminary planning and organization. A ski movement lengthens a column four or five times; therefore, the first consideration is to try to shorten columns. The best marching order for a company or a battalion on skis is a column of fours with a distance of 6 yards between ranks and an interval of 2 yards between skiers.

h. Bivouacs

Ski detachments operating in territory occupied by the enemy must camp in thick underbrush or woods, and only in exceptional cases in towns and villages. When stopping for rest in a town or village cannot be avoided, the following precautions should be observed:

(1) Personnel should be billeted in whole detachments in a concentrated area, preferably isolated from other buildings;

(2) Commanders should remain with their detachments;

(3) Hostages should be taken;

(4) Local inhabitants should be prevented from leaving the area and a strict curfew imposed;

(5) Roads should be strictly patrolled, guards should be placed on all roads leading out of the area, and all persons attempting to enter or leave should be detained;

(6) Strict watch on all the inhabitants should be established to prevent them from communicating with the enemy;

(7) All wires should be cut.

Troops should bivouac in tents or in specially constructed shelters; skis and ski mountings should be placed to the right of the entrance; rifles, machine guns and ammunition must remain with the men. The following security personnel must be detailed: guards within the camp area, a routine guard, orderlies in each detachment, and patrol. All personnel should know definitely what to do in case of alarm. In order to be able to repel enemy attack, trenches should be dug in the snow, and weapons kept in constant readiness to open fire immediately. To insure a state of constant preparedness for battle, as well as uninterrupted rest, provision should be made for all-around defense at a sufficient distance from the camp area to permit assembly and preparation for battle after the alarm is given. The strictest discipline in opening and maintaining fire at night should be enforced. The fire should be opened only by order of the commander. All traces of the presence of ski troops at halts and camp sites should be carefully eliminated.

16. NOTES ON JAPANESE OPERATIONS

In some instances the fighting in Guadalcanal has developed new tactical problems which the terrain and general climatic conditions have aggravated.

The following brief report presents some notes on Japanese tactics submitted by a U.S. observer recently returned from the South Pacific Theater. These notes represent the observer's own conception of the situation based on personal conversations and contacts established at different points. It should be remembered that the visits made at various points in this area were of only a few days' duration.

a. General Tactics

The Japanese attack in force was regularly preceded by a 10-to 14-day cycle of events. This cycle included the following activities:

(1) Continued landings from destroyers each night for a period of 7 to 10 days;

(2) Shelling of the position by cruisers and destroyers standing off shore about 4 miles (The same naval force that executes the landings proceeds by the position, shelling it from 1 to 2 hours. This is obviously possible only when the

Japanese have local control of the sea.)

(3) Heavy bombing raids of 20 or more bombers, escorted by Zero fighters, generally between the hours of 1100 and 1400;

(4) Finally, combined shelling, bombing, and land attack by the Japanese forces, who by this time have organized all their forces ashore, completed their reconnaissance, and marched into position near the MLR.

Comment: In their movement toward the defensive position, the main Japanese force is preceded by a patrol of senior officers. These officers attempt to determine the weak spots in the position. If the patrol is killed or surrounded the main Japanese force continues on regardless, without apparent effort to complete their preliminary reconnaissance or make any deviation from their original plans. On numerous occasions, it was quite obvious that once the Japanese had committed themselves to a plan of attack, they would not alter the plan, regardless of the resistance encountered. In certain instances, attacking forces, after being halted by machine-gun fire, have withdrawn and reorganized a second and even a third time, until all have been killed.

b. Night Attack

At night the Japanese attempt to draw the Marine's fire by rattling sticks, etc. If the Marines open fire, the Japanese immediately fire in the direction of the flash. Marines cannot accurately return this fire, as the Japanese use flashless powder. At night, in close combat, the Japanese use hand grenades, identifying their target by the flash from the Marine's rifles.

Japanese troops have not surrendered under any condition. They have committed suicide or killed each other rather than surrender. When he indicated an intention to surrender, the Japanese did so only in order to gain the advantage to kill his enemy. The Marines caught on very soon to these treacherous tactics.

MECHANIZED VEHICLES

17. LESSONS FROM ARMORED OPERATIONS

The following report contains several lessons learned as a result of British armored operations in the Middle East.

a. Smoke Shells

Smoke shells have been very effective. In a tank versus tank action, they are used to blind enemy antitank and other supporting weapons, either as a screen, or as a general cloud over the enemy's position. It is an accepted fact in North Africa that conditions of very poor visibility, such as obtain when smoke is used, always hamper the defending guns more than the attacking tanks.

b. 57-mm Antitank Gun

The tactical employment of the 57-mm (British six-pounder) antitank gun differs little from that of the 40-mm (British two-pounder) antitank gun. The 57-mm guns must always be fired from an emplaced position except in hit-and-run operations, and even then if time permits. Digging in, camouflage, and the withholding of fire until a hit is certain, are all of vital importance; if the gun has been discovered, fire should be opened at once.

c. Motorized Battalion

The motorized infantry battalion is an integral part of the armored regiment during all operations. It normally accompanies the combat troops, and very rarely marches with the supply echelon. This battalion is equipped with sixteen 57-mm antitank guns, 12 heavy machine guns, and 4 heavy mortars. It is organized very flexibly and is highly mobile. Individual companies of this battalion are nearly always decentralized and attached to armored battalions forming a part of the regimental group. Various roles which have been allotted to the infantry of this motorized battalion are as follows.

(1) Flank Guard

An armored regiment during operations at Sidi Rezegh, concerned with the security of its left flank, sent out its motorized battalion as a security patrol. The battalion successfully accomplished this mission.

(2) Night Operations

Whenever possible, armored regiments are protected by patrols formed from the motorized battalion. These patrols operate about 3 miles from the bivouac area as a guard against surprise attacks. Sometimes they form combat patrols, but it should be noted that they cannot be used both day and night for any length of time with efficiency.

(3) Antiairborne Attack

The motorized battalion can be used as a highly mobile force in readiness to guard against possible parachute or airborne attack directed at vital installations within the division area.

18. GERMAN METHODS OF ARMORED ATTACK BY SMALL UNITS

The following report is from a lecture by a British colonel who recently returned from the Middle East where he commanded the artillery of a corps in the Western Desert. His lecture was based on both personal experience and intelligence reports.

a. Composition of German "Box" (Moving Defense Area)

The box is the part of the column which is inside the solid line in sketch C. The box varies in size, but if an armored battalion is the basic unit, it might contain the following combat troops, in addition to the service elements:

- One battalion of motorized infantry, usually carried in half-tracked, lightly armored vehicles;
- One battalion of 50-mm antitank guns;
- One battalion of 88-mm antiaircraft-antitank guns;
- One battery of 150-mm close-support infantry guns, sometimes on self-propelled mounts;
- One battalion of field artillery.

On the move or in the attack, the guns within the box are disposed as shown in sketch C. Infantry guns and field guns are usually kept in the box only when the defensive is assumed.

In size, the box is approximately 2 miles deep and has a front of 800 yards. The 88-mm gun, though it has proved a very effective antitank gun, is primarily included in the box to protect the lightly-armored vehicles from air attack.

b. The Method of Advance (see sketch A)

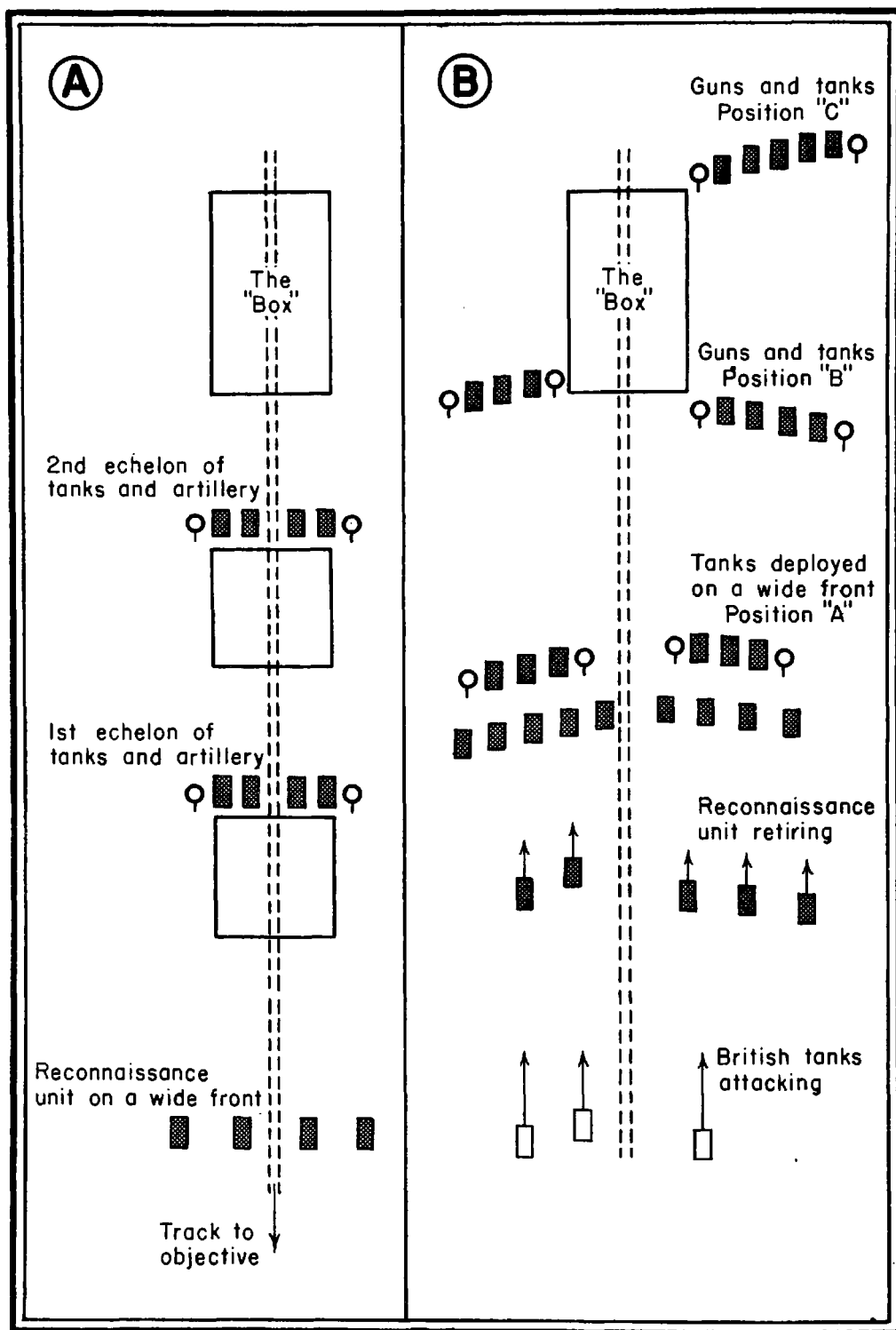
On very flat country, the distance between the reconnaissance unit and the leading echelons of tanks is from 5 to 10 miles; the distance between the 1st and 2nd echelon of tanks is 1 mile, and the distance between the 2nd echelon of tanks and the box is 2 miles.

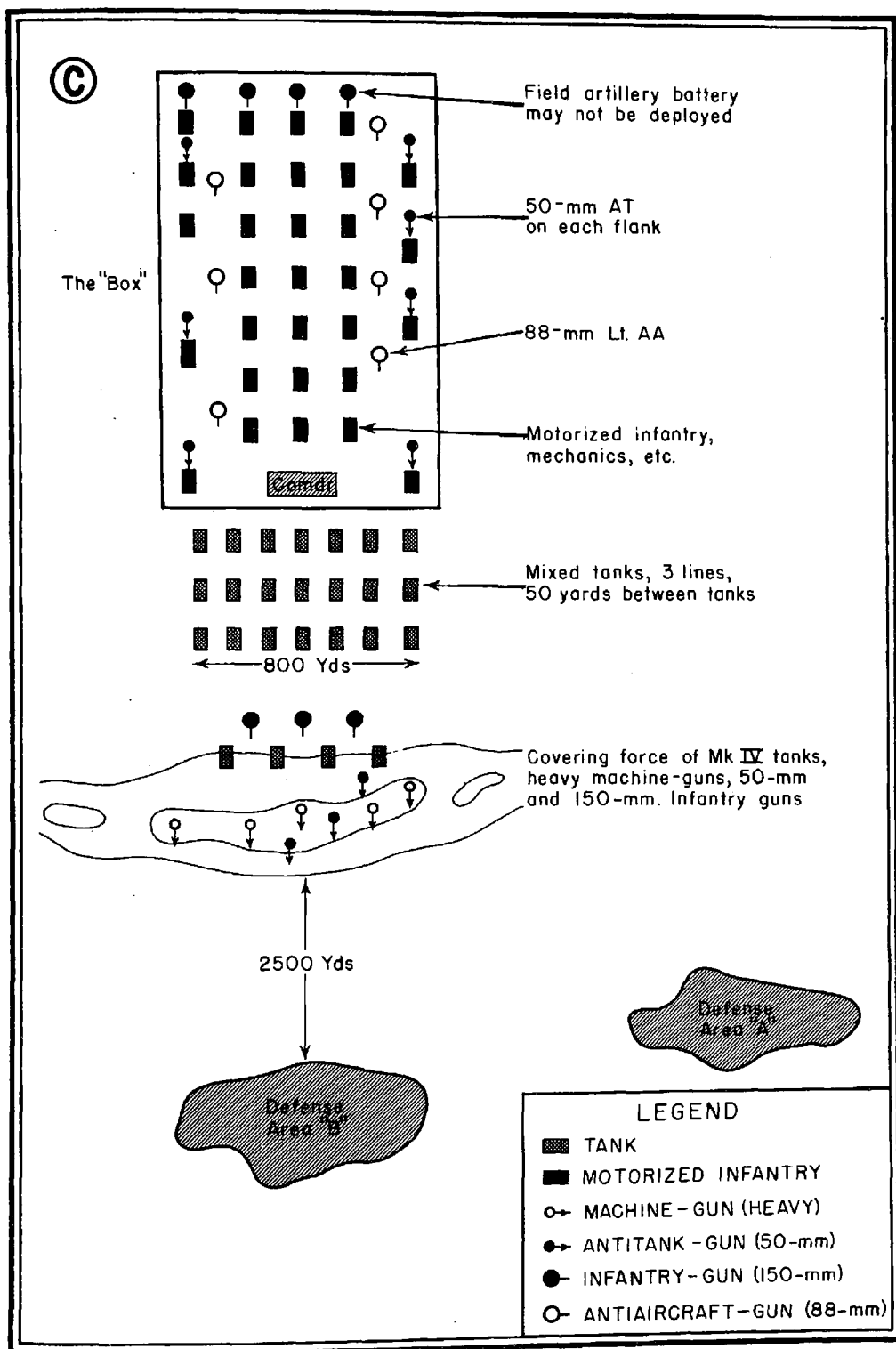
The whole force is directed towards some terrain feature, which, if captured, will force the enemy to fight on ground chosen by the attacker.

Over normal terrain, each portion of the column moves from high ground to high ground by bounds. Each echelon of tanks is supported by artillery which moves in the rear of the tanks.

c. Tactics if Attacked on the Move

When British tanks are reported to be advancing to a fight, the box halts and takes up a position for all-around defense. As the British tanks advance, the reconnaissance units fall back, and the two echelons of tanks deploy on a wide front (see sketch B). If the enemy continues to advance, the Germans continue the retirement to position B (sketch B), and force the enemy to attempt a break-





through against one of the flanks of the box.

If the enemy decides to attack the German left flank, the troops on the left of the box at position B fall back to position C. The enemy tanks, if they pursue, are then not only engaged frontally by the German tanks from position C, but are caught in flank by AT and AA guns of the left side of the box. Finally, the tanks to the right of the box at position B swing around and engage the attackers in the rear.

If artillery has accompanied the tanks in the advance, it may either continue to support them, or enter the box to stiffen its antitank defense.

d. Attack Led by Tanks Against an Organized Position

In general, the Germans assume that the defenders have seized and occupied the best positions; hence, they attempt to overwhelm him and take over such positions.

The German commander usually launches a frontal attack against one center of resistance. The attack might be developed in the following way (see sketch C).

Phase I: The German commander will reinforce his reconnaissance unit with tanks deployed on a wide front and drive in the covering force, until the enemy is approximately 2,500 yards from the main line of resistance.

Phase II: A careful reconnaissance will then be carried out by a senior commander in a tank.

Phase III: The German covering force deploys as follows:

Tanks, generally Mark IV's, take up a hull-down position on a ridge, or high ground, and with the fire of their machine guns attempt to pin down the defenses. They may engage AT guns that are visible with their 75's. Under cover of this fire, 50-mm AT guns, heavy machine guns, and close support 150-mm infantry guns are also deployed in an attempt to knock out the AT guns of the defense, or to kill their gun crews.

Under the cover of fire of this covering force, the attack forms in rear as follows:

(1) Three rows of tanks about 50 yards apart, each row approximately 150 yards in rear of the one in front.

(2) When the tanks are in position, the box forms up in rear as shown in sketch C, the infantry all riding in vehicles.

Phase IV: At H hour, the whole force moves forward at about 15 mph, depending on the ground. As they pass through their covering force, the tanks begin to fire, not so much with a view to hitting anything, but for the psychological effect and to keep the defenders pinned down. On arrival at their objectives, some tanks drive straight through to the far side of the objective, while others assist their infantry in mopping-up operations. The infantry does not usually dismount until they arrive at the objective, when they fan out and use tommy guns extensively.

Phase V: When the attack is successful the covering force moves forward into the captured area to stiffen the defense. The tanks are usually withdrawn and serviced near what has now become their rear area.

19. SIMULATED TANK ATTACK

Several reports have been received in the past which indicate that the Axis forces in the Middle East use many ruses to simulate tank attacks (see Tactical and Technical Trends, No. 12, p. 33). The following report indicates another ingenious method.

During the attack on Benghazi in January 1942, German infantry advanced in motor vehicles. These vehicles advanced in line, and had chains fixed between them. These chains trailed along the ground and raised a considerable dust. This gave the impression that a tank attack had been launched. Volkswagen (comparable to U.S. quarter-ton vehicle) and armored cars have also been camouflaged to simulate tanks.

20. RUSSIAN TANK TACTICS AGAINST GERMAN TANKS

The following report is a literal translation of a portion of a Russian publication concerning the most effective methods of fire against German tanks.

* * *

a. Manner of Conducting Fire for the Destruction of Enemy Tanks

For the successful conduct of fire against enemy tanks, we should proceed as follows:

(1) While conducting fire against enemy tanks, and while maneuvering on the battlefield, our tanks should seek cover in partially defiladed positions.

(2) In order to decrease the angle of impact of enemy shells, thereby decreasing their power of penetration, we should try to place our tanks at an

angle to the enemy.

(3) In conducting fire against German tanks, we should carefully observe the results of hits, and continue to fire until we see definite signs of a hit (burning tanks, crew leaving the tank, shattering of the tank or the turret). Watch constantly enemy tanks which do not show these signs, even though they show no signs of life. While firing at the active tanks of the enemy, one should be in full readiness to renew the battle against those apparently knocked out.

b. Basic Types of German Tanks and their Most Vulnerable Parts

The types of tanks most extensively used in the German Army are the following: the 11-ton Czech tank, the Mark III, and the Mark IV. The German self-propelled assault gun (Sturmgeschütz) has also been extensively used.

In addition to the above-mentioned types of tanks, the German Army uses tanks of all the occupied countries; in their general tactical and technical characteristics, their armament and armor, these tanks are inferior.

(1) Against the 11-ton Czech tank, fire as follows:

- (a) From the front--against the turret and gun-shield, and below the turret gear case;
- (b) From the side--at the third and fourth bogies, against the driving sprocket, and at the gear case under the turret;
- (c) From behind--against the circular opening and against the exhaust vent.

Remarks: In frontal fire, with armor-piercing shells, the armor of the turret may be destroyed more quickly than the front part of the hull. In firing at the side and rear, the plates of the hull are penetrated more readily than the plates of the turret.

(2) Against Mark III tanks, fire as follows:

- (a) From the front--at the gun mantlet and at the driver's port, and the machine-gun mounting;
- (b) From the side--against the armor protecting the engine, and against the turret ports;
- (c) From behind--directly beneath the turret, and at the exhaust vent;

Remark: In firing from the front against the Mark III tank, the turret is more vulnerable than the front of the hull and the turret gear box. In firing from behind, the turret is also more vulnerable than the rear of the hull.

(3) Against the self-propelled assault gun, fire as follows:

- (a) From the front--against the front of the hull, the drivers port, and below the tube of the gun;

- (b) From the side--against the armor protecting the engine, and the turret.
 - (c) From behind--against the exhaust vent and directly beneath the turret.
- (4) Against the Mark IV, fire as follows:
- (a) From the front--against the turret, under the tube of the gun, against the driver's port, and the machine-gun mounting;
 - (b) From the side--at the center of the hull at the engine compartment, and against the turret port.
 - (c) From behind--against the turret, and against the exhaust vent.

Remarks: It should be noted that in firing against the front of this tank, the armor of the turret is more vulnerable than the front plate of the turret gear box, and of the hull. In firing at the sides of the tank, the armor plate of the engine compartment and of the turret, is more vulnerable than the armor plate of the turret gear box.

ORDNANCE

21. GERMAN 200-MM SPIGOT MORTAR BOMB

It is now established that a new weapon has been introduced into service in the German Army and is known as the 200-mm spigot mortar. It is intended for the destruction of obstacles, minefields, and gun emplacements.

a. General

The mortar appears to be of normal spigot design,* except that fixed ammunition is not used, the propellant case being attached to the top of the spigot before the bomb is loaded.

The projectile appears to have an egg-shaped body, containing the explosive charge, and has a long tubular tail with fins at the base (see accompanying sketch).

It would seem from the figures quoted below that the explosive charge constitutes a very high percentage of the weight of the bomb itself, excluding the tail-piece. The ratio may be up to 70 or 80 percent. It is clear, therefore, that there will be considerable blast effect with comparatively little fragmentation.

The blast would give good effect against personnel. The effect against concrete and armor would also be high. Presumably the weapon would be used to produce a lane through minefields, the mines being destroyed by sympathetic detonation. It is not considered, however, that the effect would be sufficiently great to represent a very substantial advance in minefield clearance methods.

Based on the charge and weight of the projectile, it does not seem likely that the maximum range will exceed 500 yards. The provision of three charges indicates that there is a very low minimum range, and it is possible that the recent incendiary projectiles, reported as having a range of only 200 yards, may be a version of this projectile fired from the same weapon.

In spite of the large caliber of the weapon, it seems certain that it will not be unduly difficult to manhandle. It can be effective as airborne or parachutist equipment.

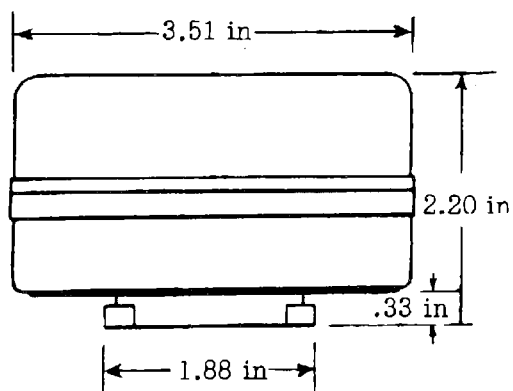
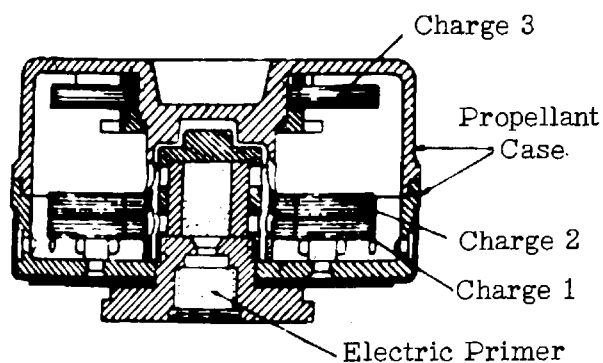
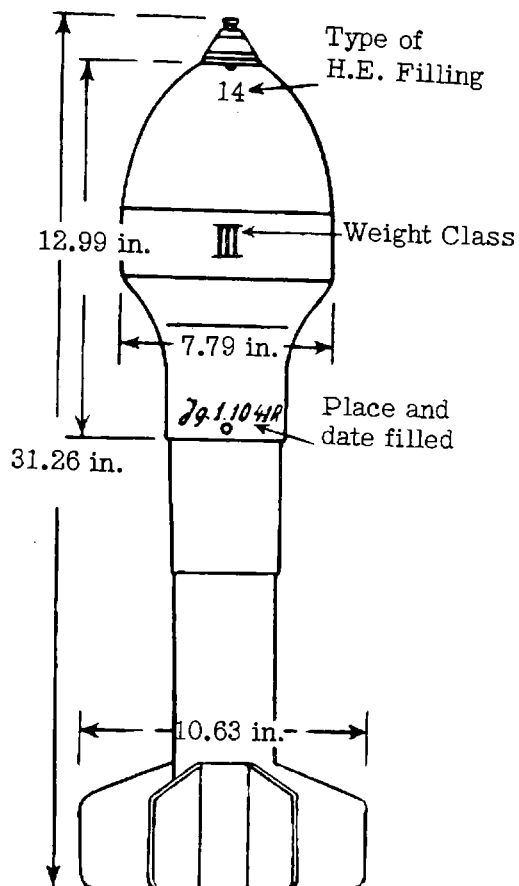
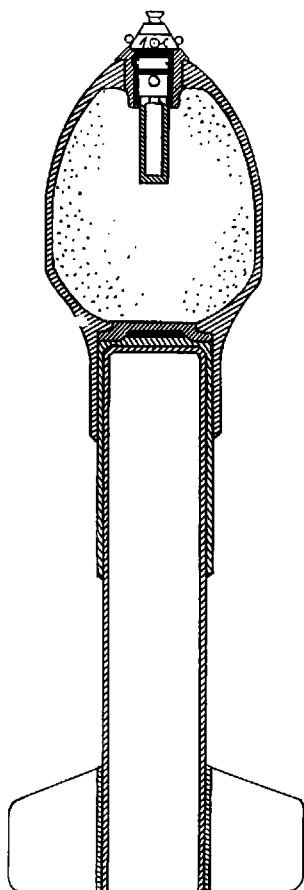
The possibility of an incendiary filling has been noted. There is also no reason why a smoke or chemical filling could not also be used.

b. Model 40 HE Bomb

This is a nose-fuzed bomb with a high charge-weight ratio, and is fitted with a tubular tail with 8 stabilizing fins.

*The spigot is a rod extending up through the tubular tail of the mortar bomb. Traverse and elevation are directly controlled by manipulation of the spigot; the tube simply serves to confine the blast of the propellant.

MODEL 40 BOMB FOR GERMAN
200-MM (7.87 IN.) SPIGOT MORTAR



PROPELLANT CASE

Range, estimated	200 to 500 yds
Weight of bomb, filled	46.75 lb
Diameter	7.79 in
Diameter of tail fins	10.6 in
Total length of bomb	31.26 in
Length without fuze or tail	12.99 in
Diameter of spigot	3.5 in
Weight of TNT filling (approx)	15 lb

The fuze can be set for instantaneous or delay action. The three charges weigh 540, 370 and 185 grains, respectively. The propellant is nitroglycerine ring powder, and is contained in a steel propellant case fitted with an electric primer.

QUARTERMASTER

22. GERMAN 21ST ARMORED DIVISION--DIVISION SUPPLY

The German Afrika Korps has, at least until somewhat recently, operated very successfully in North Africa. No small part of this success can be attributed to an efficient German supply system.

According to prisoner of war statements the division supply elements of the German 21st Armored Division (Afrika Korps) consisted of a supply company and 12 supply columns.

The 12 supply columns consisted of 4 heavy columns, 7 light columns, and 1 gasoline and oil column. A heavy column had 24 vehicles with an aggregate capacity of 60 tons; a light column had 12 vehicles with an aggregate capacity of 30 tons. The 12 columns, exclusive of the gasoline and oil column, thus has a total cargo capacity of 450 tons.

The supply company was actually an Arbeitskompanie or labor company. Its function was to cooperate with the division supply columns by carrying out such tasks as unloading, establishing dumps, maintenance, etc. The strength of the company was estimated at from 200 to 250 men.

The division was reported to maintain 3 supply dumps--one each for Class I, Class III, and Class V supplies--which were close together and forward of which supplies were never moved by division transport. It was the function of unit transport to move supplies to the front from these dumps. The operating radius of both the supply columns and supply company was said to be from 100 to 200 kilometers (60 to 120 miles).

23. WATER SUPPLY OF A GERMAN TANK BATTALION IN LIBYA

The following report gives one example of the problem of supply of troops operating in the desert. A German tank battalion, leaving Tripoli for El Agheila in 1941, took the following water supplies for three days' march:

Unit	For Engine Cooling	For Washing Purposes
Headquarters Company	122*	150
5th Company (light)	111	100
6th Company (light)	114	100
8th Company (medium)	93	100
Total	440	450

*All figures refer to the number of containers carried by the particular unit; each container held about 5 gallons.

The above containers were distributed throughout the battalion as follows: one container per car; two containers per truck, half-track, armored car and light tank; three containers per medium tank.

This quantity of water represented only one-third of the total amount that had to be taken. The remainder was carried in a special water column, and provided about 2 gallons of water per man for the three-day period. The distribution among vehicles was in proportion to the number of personnel carried.

Each company carried 130 containers with water for cooking. These containers were carried on the supply trucks which accompanied the field kitchens.

The total amount of water carried by the battalion was as follows:

Cooling	5,100 gallons
Washing	2,250 gallons
Cooking and Drinking	<u>4,465</u> gallons
Total	11,815 gallons

A comparison of the amounts per man per day between the British and Germans is as follows: the Germans allow $2/3$ of a gallon for washing, $1\frac{1}{3}$ for cooking and drinking; the British allow 1 gallon for washing, and 1 for cooking and drinking.

24. VARIETIES OF JAPANESE UNIFORMS

Recent experience in operations has shown that the Japanese do not wear a strictly standardized uniform. The divergence of the varieties so far encountered is shown in the reports given below. The only unanimity in the reports seems to be on the slovenly appearance of the troops.

The uniform is varied and the following combination of dress has been observed:

- (1) Khaki blouse and trousers, puttees and rubber-soled shoes;
- (2) Khaki blouse, blue (denim) trousers, puttees and rubber-soled shoes;
- (3) White shirt, khaki trousers, puttees and rubber-soled shoes.

The shoes seem to be always the same type, and for jungle fighting are probably superior to heavy shoes.

The Japanese usually carry no equipment apart from a belt containing ammunition pouches. However, packs, haversacks, and large map cases have been captured, so they are apparently worn in some cases. Water-sterilizing outfits are also carried.

There was nothing uniform about the clothing; some wore white shirts, some green, and some khaki. Steel helmets were worn by some, while others wore cloth caps. All that were observed had knee breeches, and some sort of leggings.

In one instance in Burma a British officer reported that the Japanese were all dressed in khaki breeches, and had a yellow star on their field caps with a blue and white shell (cornucopia-shaped) badge above the star. He presumed that this was some regimental insignia. Officers and senior NCOs all had a long curved sword which they always wore.

A British soldier reported that the Japanese dress was mixed and always very dirty. Trousers and puttees, and in some case heavy shoes, were worn, or else the common split-toed rubber shoe.

In Malaya, the color of the uniform used by the Japanese was khaki or khaki-green, with the trousers tapering at the ankle. In Borneo the uniform worn was a brownish-gray color; reconnaissance patrols wore only shirts, shorts, and light-weight shoes with rubber soles. The uniform worn by naval landing troops is gray-green, and is hard to distinguish from the uniform worn by the Dutch in the Netherlands East Indies.

SIGNAL CORPS

25. GERMAN AUTOMATIC METEOROLOGICAL TRANSMITTER

This meteorological transmitter was found to be located in the open on land, and serves a purpose similar to the larger, floating meteorological stations known to be used by the enemy.

The full equipment comprises a complete low-power, short-wave transmitter, automatically operated by meteorological instruments, to record the temperature and pressure in the locality in which it is stationed. The times and periods of transmission are set on a master clock.

The transmitter is a Lorenz crystal-controlled, four-tube transmitter made in 1940, operating over two wave bands: 17.5 to 6.6 and 6.6 to 5.6 megacycles per second. The tubes are master oscillator, frequency-doubler, and two 15-watt output tubes, in what appears to be a push-pull circuit. Continuous wave or interrupted continuous wave can be transmitted when the transmitter is switched on by the clock mechanism. This transmitter is obviously a factory production and is well mounted in a tubular frame, but the whole is encased in a weatherproof container of doubtful efficiency and "workshop" finish. The clock unit was also in this container, but was sealed in its case with a waxed-wood cover and a waterproof packing.

The meteorological controlling unit is a Morse-sending device, the signals sent being altered by the positions of three contactors, and the contactors being moved by the meteorological instruments. In addition, a further contactor is hand-set, presumably to pick out the recognition signal of the meteorological station. The operating meteorological devices consist of a curved bi-metallic strip for registering the temperature, and two barometers, one with twin capsules (coarse reading), and the second with four barometric capsules (fine reading). It is necessary to provide two barometric devices in order that the full reading may be obtained. It is thought that the first instrument will transmit a signal indicating the nearest millimeter, and the second will provide the decimal part of the local pressure reading. The contactors, operated by a geared-up rack-and-pinion movement, are in the form of 10-finger stars with sharpened points, arranged around the circumference of a circle. The result of a change of temperature or pressure is to alter the position of these points relative to the axis of this circle. The rotor, or contact arm on which these contactors operate, consists of a sector-shaped piece, the circumference of which moves around the circle inscribed by the contactors. The sequence is that the sector first makes contact with the identification signal, then with the coarse barometer, the fine barometer, and finally, the thermometer contactor.

It should be understood that, according to the setting of the contactors, a different signal is picked up by the projecting fingers. Anyone receiving this signal can ascertain the position of the contactor, and hence the temperature or pressure at the moment of transmission, if the key of the coding on the rotor arm is available.

The clock is an elaborate mechanism for performing the simple task of making contact between two leads for the periods of transmission. It consists of an electrically wound clock which registers the time by means of a rotating

disk, engraved with the 24 hours. The switch operating devices are secured by means of two thumbscrews around the periphery of this disk. The two leads, "shorted" by the clock, switch on the transmitter and meteorological unit. There are two batteries in the set: one a 24-volt, 69-ampere hour, low-voltage unit, contained in a weather proof metal case, 3 feet 6 inches by 1 foot square; the other, a high-voltage battery consisting of four 90-volt cells connected in series. The latter was of similar type and construction but of 11-ampere hour capacity.

26. GERMAN ARMY SIGNAL REGIMENT

There is evidence of the existence of a German signal regiment organized as follows:

1 Battalion	1 Company	Radio company
	2 Company	Armored signal company
	3 Company	Intercept company
2 Battalion	4 Company	Wire-laying company
	5 Company	Telephone operating company
	6 Company	Telephone operating company

While it is doubtful whether the intercept company was ever activated, it reportedly consisted of three platoons, whose respective functions were radio intelligence, intercept, and direction finding. The strength of the regiment is 45 officers and 1,674 enlisted men.

GENERAL

27. AIDS TO MOVEMENTS AT NIGHT

The following two methods of marking lanes through minefields, and routes for troops moving through the desert have been recommended as being most effective. They are simple to construct, and are not apt to be misunderstood.

a. For Marking Lanes through Minefields

Remove the lid from an ordinary tin can, and fill it with Diesel oil to within one-half inch of the top. Fix a piece of wire screen over the top and run several pieces of ordinary twine through it. This twine should project about three-quarters of an inch over the screening. The lamp will burn for 8 to 10 hours after being lit.

The lamp is then covered with a larger tin can. Cut an arrow in the side of the larger tin can, and cover on the inside with a strip of oiled paper. The arrow is obscured from air observation by means of a strip of metal. Experiments have shown that the light can be plainly seen at night at a distance of 150 yards. The lamps should be staggered on either side of the lane.

b. For Marking Routes for Troops

Remove the lid of a gas or water can, half-fill with sand, and saturate the sand with undiluted gas. When lighted, this will burn for about 1 1/2 hours. It can be seen for about 550 yards.

28. SELECTIONS FROM JAPANESE FIELD INSTRUCTIONS

The task of interpreting Japanese tactics is considerably facilitated by a study of their own documents. The following extracts taken from translations of Japanese field instructions contain many concrete admonitions as to the action of small units in combat conditions.

* * *

a. Morale

The unit commander himself must not give up hope or make pessimistic statements. In a battle always remember the "4 to 6 ratio" - if 4 of our men are knocked out, consider that we have got 6 of the enemy. Whatever may be our own losses, keep up morale. The more violent the fighting, the calmer and firmer must be the commander's bearing, orders, and words of command. It is also important, for the encouragement of morale, not to let the personnel of the unit know the number of killed and wounded, or their names.

In operations when our positions face those of the enemy, the most unpleasant thing is to see the tendency of our own personnel to fall into a passive attitude. This is the reaction of ambitious men who say "getting killed in our own positions is the same as being slaughtered without resistance. Our father and brothers are going to be ashamed of us. If I am going to be killed, I want to die fighting"--so this attitude is not to be construed as the result of cowardice. Although it may be a difficult task, the men must be made to feel that they are on the offensive, even when they are in a defensive position. For this purpose, it is necessary to carry out fierce counterattacks from time to time. With us, the fiercer the fighting, the higher our morale.

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

To eradicate the sense of fear in raw soldiers, killings with the bayonet should be carried out whenever an opportunity occurs. Raw troops, being unused to fighting, suffer relatively heavy casualties, and attention should be paid to this point.

Before going into action, succession of command must always be clearly indicated. Unless this succession is defined right down to the last soldier, and training carried out until this becomes practically automatic, fighting may become confused if the unit commander becomes a casualty. When the unit commander is killed or wounded, the effect on the personnel is extremely great, and morale tends to decline. On the other hand, even if one man after another is killed, and the situation is tragic, if the men see their commander's face full of vigor, their courage increases a hundred-fold.

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

b. Expenditure of Personnel

As a landing party staff officer says in his "Instruction in Practical Strategy": "Would you throw away the lives of your men, who have been given into your keeping by the Emperor, by recklessly sending them on a frontal charge in the face of the enemy fire, ignoring your own shortcomings in leadership and strategy?" As a commander, bear this well in mind. In a word, your objective must be to attain the greatest results with the smallest sacrifice. If you order your men to advance, they will obey you in any circumstances and at all times. But remember that before doing this, you are to take the minutest precautions. Do not forget to explain to your men, as carefully as if they were little children, how and in what direction to advance, the places to watch, and what to do when shelled or attacked by hand grenades. For example, how many men would have come through unscathed if they had been ordered to lie down--"to get down until your head is on the ground." This may sound like a graceless criticism of men who have given their lives, but we believe many men have become casualties through their own carelessness and want of caution. It is true we have dedicated our lives to the Nation and will not begrudge them at any time, but we want to accomplish something by our death, and not to die uselessly. We want to die gloriously. We hope for a death worthy of a Samurai, like Lieutenant X, and we owe it to the men under our command to enable them to do likewise. If you do this, as the commanders of a unit you will have a measure of peace of mind.

Too much eagerness to do something outstanding must be strictly avoided; it has sometimes led to heavy losses. This is particularly true of units going into action for the first time. Some young soldiers think it heroic to expose themselves to the enemy; take care of this, particularly in a battle of positions.

Too long a wait in the same area will result in drawing concentrated fire from the enemy, and is inadvisable. When moving, the proportion of hits from bullets is smaller than when halted. In a charge, if you meet concentrated fire from the enemy at close quarters and lie down and stay glued to the same spot, you cannot advance. Also, the longer you halt, the more your will to advance is blunted, and the greater your casualties. Therefore, charges must be made with determination and daring. In this way, your casualties will be smaller, and your morale will be improved. If you act with determination, even the Gods will ward off harm, and in the midst of death there will be life. [Translator's note- Nothing really devotional about this - more a figure of speech than anything else.] A daring and determined attack is the key to victory.

c. Machine-Gun Units

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

All machine-gun personnel with the exception of the gunner must be armed with rifles. This is particularly necessary in street-fighting, fighting at close quarters, etc. Even when attacking and advancing, the carrying of rifles never impedes the advance. In case of an enemy attack, it is easy to make a sortie with the machine-gun ammunition personnel. The ideal rifle for machine-gun personnel is the short barrel rifle.

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

If two machine guns are used, they can be fired alternately, giving the enemy no pause for a counterattack, while the rifle units at the flanks must endeavor to create an opportunity for an attack. If absolutely necessary to carry one shovel for each machine gun. If possible, four bags for sand should be carried for each gun.

The normal machine-gun squad should be increased by one man, and three boxes of ammunition should always be carried. Particularly in an advancing attack, there are occasions when replenishments from the rear do not arrive in time.

d. Sniping

When the enemy takes to fortified trenches to try to stop our advances, the greatest precautions must be taken against sniping. The enemy usually waits for an interruption in our fire to send a single deadly shot.

When confronting the enemy, do not put your head out for reconnaissance or observation more than once from the same place. A sniper will have his rifle sighted to get you the second time. There are times when you suffer through underrating the enemy.

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

e. Equipment

The fireman's hatchet is necessary for emergency engineering work in street fighting. An ax is a little too big. The fireman's hatchet is best when confronted by an enemy at close quarters.

Canteens should be kept filled to capacity at every opportunity. Those who carry only a small quantity of water, claiming that heavy equipment impedes their movements, are always those that try to drink from other men's canteens later. Bear in mind also that when men go into action for the first time they feel particularly thirsty.

f. Attacks

The best time to halt an advancing attack is about 1500. If the attack is not halted until after dusk, there is danger of our defense against enemy attacks relaxing; besides, our fighting efficiency next day is bound to deteriorate. When an advancing attack is halted, we must immediately build a satisfactory offensive position and not leave anything undone that we may be sorry for when the enemy attacks.

When an area is captured, mopping-up operations should be carried out as quickly as possible, and our gains consolidated. Abandoned enemy corpses must be given the coup de grace.

In a charge, the platoon commander must be at the head, as indicated in the Manual. The charge is the moment when hardship and fatigue reach their climax, from the commander of the unit down to the last man. At this time, if everyone is determined to carry out the unit commander's orders without hesitation, and if the platoon commander advances at the head of his men, the spirit of daring and solidarity aroused in the company will enable them to penetrate the enemy position.

g. Miscellaneous

In maneuvers, we have always had it emphasized that we must know the tactical situation. During the battle of X a certain unit commander boasted that he had decided to make a charge and thereby greatly embarrassed his company commanders. We believe this was a case of blind decision. We had been ordered by the battalion commander to strengthen our position and defend it to the death - this means if your arms are broken, kick the enemy; if your legs are injured, bite him; if your teeth break, glare him to death. This spirit is expressed in the words "defense to the death. The time to launch a charge is when the enemy has reached the limit of exhaustion. In defense, we believe that if you can hang on to a position with one light machine gun, one platoon can successfully crush the enemy.

When wounded, the unit commander's permission must be obtained before leaving the firing line. If the unit commander is not in the vicinity, request should be made to another officer, or to an NCO of the section. This is clearly indicated in the Manual, and even if a man is ignorant of the regulation, common sense should tell him that this procedure should be followed. Sometimes a man leaves the firing line when his injuries are not such as to prevent him from continuing to fight. This is a most cowardly action.

No firing must be done at night. This is something we feel very keenly in the present fighting. Care must be taken in this respect, since it is the natural tendency when shot at, to shoot back. If we are maneuvered into firing by the enemy, we reveal our firing line; show him the position of our automatic weapons, and give him an outline on which he can base his tactics.

The enemy's camouflage is truly efficient. We have found it hard to discover him, and thereby have suffered unexpected losses. At over 500 yards, his camouflage cannot be distinguished, and great care must be taken. Training against camouflage should also be carried out.

The quickest means of communication after a battalion has deployed (with the exception of special orders) is by flag signalling if the visibility of the terrain permits. It is very important, therefore, for the commander of the unit headquarters not only to pay attention to the enemy, but also to keep in mind liaison with the commanders at the rear and flanks. It sometimes happens that when the fighting becomes particularly violent, the situation of every officer and man becomes absorbed by the enemy in front, and liaison with the commander has been temporarily cut off. Furthermore, where the terrain allows visibility, simple orders can be communicated much more quickly by flag signalling than if a number of runners are used over terrain full of "freaks," etc. Therefore, every member of a landing party should be proficient in sending and receiving flag signals.

29. FOOD FROM THE SAGO PALM

The pith of the sago palm is used for food in the Solomon Islands and all the land area east thereof, up to and including the Malay Peninsula. It can be a ready and substantial source of food when more normal means of subsistence are, for one reason or another, not available. This tree is found growing wild in almost every swamp, and near most streams and lakes. Unless planted and cultivated, it is not usually found on high ground.

a. Description

The full-grown sago palm reaches a height of over 25 feet and has a diameter of about 2 feet (see accompanying picture). The outer surface of the trunk is a hard shell of tough fibrous wood an inch or less in thickness, while the entire inner portion is filled with a soft pithy substance about the consistency of cheese, with numerous coarse, rather brittle fibers running through it. The pith at the lower end of the trunk is a brownish red in color, fading out to a pure white at the top.

The leaves are long, feather-like fronds with a thick midrib bearing long sharp spines. On mature trees the leaf stems or midribs range from 8 to 12 feet in length; they are so strong that the natives use them for building the walls of their houses. At the base, where they encircle the trunk of the palm, the leaf stems are concave in shape and have a diameter of around two feet. Young trees have the entire trunk covered with leaves, but as the tree matures those on the lower part of the trunk fall off.

b. Flowers and Fruit

When the sago palm is about 15 years old it sends up tall spikes of pink or reddish flowers at the top. The flowers later develop into clusters of nut-like fruit, dry and scaly, and somewhat resembling small pine cones but having a smooth shiny surface.

To obtain the maximum amount of sago, the natives cut the palm just before the flower develops, for if the fruit is allowed to mature it will absorb all the pithy substance and the tree will be little more than a hollow shell. A certain amount of sago could probably be obtained from younger trees several years before they reach maturity, but it would be more difficult to extract and the yield might not be worth the effort involved. However, it should not be difficult, in a large grove of trees, to locate some trees on which the flower stalks were visible but not yet fully developed. A tree on which the fruit had already appeared would be of no value.

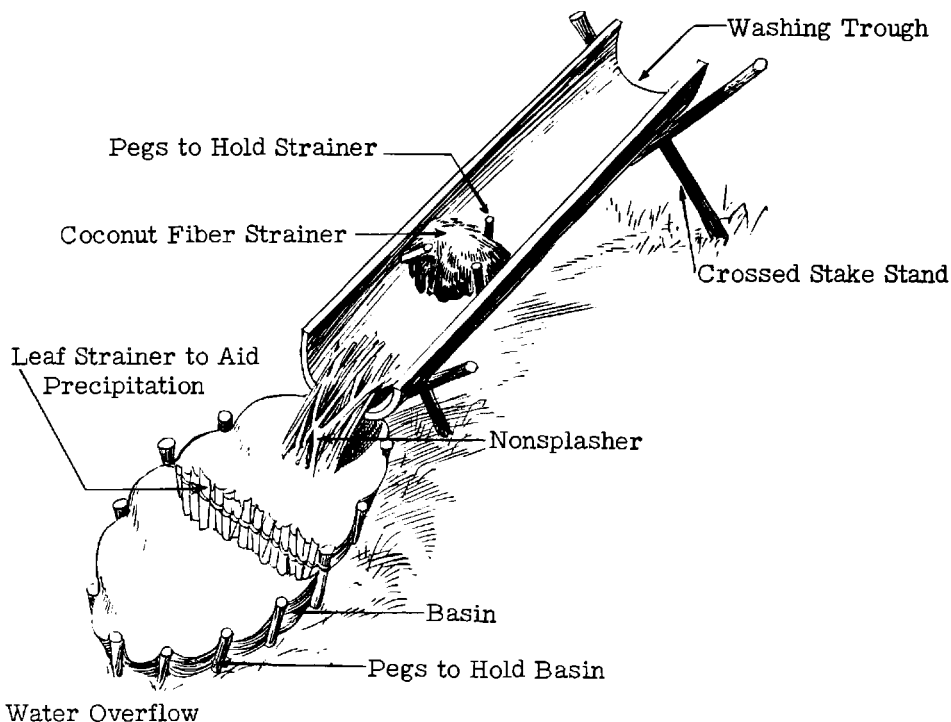
c. Extracting the Sago

To obtain the sago from the standing tree is relatively simple. The tree is first cut down and the thin outer shell removed. If an axe, hatchet, machete, or similar heavy knife is available for cutting down the tree, no additional equipment is necessary, as the further stages in the operation can be carried out



SAGO PALM--DETAIL OF TRUNK AND FRONDS

with materials readily obtained in the forest. The outer shell having been removed and the pith exposed, the pith is cut and beaten into pulp. The next step is to mash the sago starch or flour from the pith (see sketch below).



The washing trough, in which the pulpy mass is placed, can be made out of the base of one of the sago-leaf stems. As the base of the leaf stem clasps the trunk, it is quite large and for a considerable distance is concave on one side so that it makes an excellent trough. The portion used is usually from eight to ten feet long, and is set up on stakes so that one end is lower than the other. The strainer at the lower end of the trough, through which the pulverized pith is washed, is usually made of the fibrous covering of the leaf stem of the coconut palm. The mashed pith is dumped into the trough and water poured over it to wash out the starch. During this process it is worked with the hands or pounded with a stick to break it up still more. The basin into which the starchy water runs may be another sago leaf stem or a container made of large flat leaves. After the starchy water has remained in this container for a short while, it separates into a precipitate of fine flour at the bottom and water on top. The water may then be drained off, leaving a mass of damp flour as the final product of the process. When wrapped in leaves (or put in an ordinary cloth bag), this keeps for weeks.

d. Cooking

The natives have two methods of cooking sago: in gruel and pancakes. Sago gruel is made by adding boiling water to a lump of flour and stirring it in a pot over the fire until the whole mixture has a uniform, thick consistency. The technique is similar to that of preparing oatmeal. The natives then dip out spoonfuls of the gruel onto leaves and allow it to cool. When cool, it is a gelatinous cake, which may be either eaten at once or kept for several days. Natives usually carry these cakes with them when they go on trips. To Europeans these cakes are rather flat and tasteless. This could probably easily be remedied by including some flavoring material in the gruel. Even the natives always eat some other food with the cakes to provide flavor.

The second method of cooking sago is to sprinkle a large lump of the flour with water and place it on a large pottery sherd (or a frying pan) over a fire, leaving it there for a minute or two. The lump is then lifted off, leaving a thin cake adhering to the griddle. This cake is turned, after being sprinkled again on top, and is cooked on the other side. The result is a rubbery pancake, which the natives do not like as well as the sago cakes described above, but which is more palatable to a European, particularly if spread with butter or jam.

e. Locating the Sago Palm

Although the sago palm grows wild in New Guinea and in parts of Melanesia, sago fracts are always owned by nearby natives. Therefore, if it is desired to keep on friendly terms with them, they should be compensated in some way before the trees are taken from their plots. Furthermore, in New Guinea at least, these plots are owned by a patrilineal lineage rather than by an individual. Hence, care should be taken to deal with the whole lineage or a representative thereof, rather than an individual who may claim ownership. A standard price per tree should probably be set, and consistently adhered to. The natives regularly try to take advantage of whites, and a bargaining arrangement would probably lead to trouble. It is reported that a price of about 25 cents for each tree would be adequate compensation, depending on local conditions.

Native culture in New Guinea often demands that a man shall perform one part of the flour processing while a woman does another. If this division is reversed or changed, it is often believed that the sago flour will be inedible. If, therefore, natives are hired to process sago, they should be permitted to choose their own teams.

The pidgin-English term for sago is "sack-sack." Information about the location of sago swamps may be obtained from native pidgin speakers by asking: "Where stop belong sack-sack?" The native may reply: "He stop long hap (pointing)" meaning "It is in that direction." If one wishes to be guided to the place one may say: "You showim me this fellow place belong sack-sack." The pidgin term for guide is "show man." If one wishes to know how much sago there is, one may inquire: "He got plenty fellow sack-sack long this fellow

place?" or "How much sack-sack he stop along this fellow place?" If the answer is "lick-lick" it means there is but little. "Plenty fellow" means a lot. "Hot water" is the pidgin-English term for boiled sago gruel, while "fry" or "fryim" is the term for the pancakes.

SECTION II

THE GERMAN ADVANCE FROM THE NORTH--KIEV OPERATION

THE GERMAN ADVANCE FROM THE NORTH--KIEV OPERATION*

INTRODUCTION

Upon entering Russia on June 22, 1941, the German Center Group of Armies under Marshal von Bock had little difficulty in effecting a double encirclement of the cities of Bialystock and Minsk. After this victory, von Bock again pushed his group of armies eastward and effected the encirclement of Smolensk, a strategically important city known as the "western gate of Moscow". Despite the fact that the capture of Smolensk (August 6) had proved costly, von Bock again thrust forward--this time apparently in an attempt to encircle Viazma. The fighting was bitter. The German Second Panzer Army was cut off by the Russians and was rescued only by a lavish use of air power. The spearhead of the Center Group of Armies was definitely brought to a halt by Marshal Timoshenko before Moscow.

THE KIEV OPERATION

After the failure of the German Center Group of Armies to make further gains toward Moscow, and after the similar failures of the North Group of Armies approaching Leningrad and the South Group before Kiev, the Germans initiated the great double encirclement, which is generally referred to as the Kiev Operation. It is not known whether this operation was envisioned before June 22, or whether it was attempted as the only large operation possible after the failure of the frontal attacks against the three great cities.

In any event, the plan was as follows: Kiev was to be enveloped and as many as possible of Marshall Budenny's armies were to be trapped and destroyed in a gigantic double pincers envelopment, or wedge and trap operation (see map at end of article). The holding attack, and the two southern pincers arms or the southern wedge were to be from the South Group of Armies under Marshal von Rundstedt. Von Reichenau's Sixth Army, which had been halted on the Irpen River west of Kiev, was to launch the holding attack. The Seventeenth Army of von Stuelpnegel and the First Panzer Army of von Kleist were to constitute the two southern pincers arms of the southern wedge. The wedge from the north was to be formed from the Center Group of Armies of Marshal von Bock. The Second Panzer Army under General Guderian and the Second Army under General von Weichs constituted the northern pincers arms. The outer pair of pincers, the two Panzer Armies, was to close about 125 miles east of Kiev.

Of course, no two double pincers or wedge-and-trap (Keil and Kessel) operations are exactly alike, but the Kiev operation may be regarded as typical.

* This is the third and last article of a series on the Kiev Operation, June 22--September 22, 1941. For an account of the German advance from the south, see "The German Crossing of the Dnieper in the Kremenchug Area (Kiev Operation)," Tactical and Technical Trends, No. 7, p. 40. For an account of the holding attack, see "A German Spearhead in the Kiev Operation," Tactical and Technical Trends, No. 11, p. 47.

The scheme of maneuver was basically the same on both flanks. The outer pincers arm (a Panzer army) drove forward to meet the approaching arm. As the armored spearhead moved on, small task forces were thrown off on the outer flank for security, and on the inner flank to drive the Russians toward troops of the inner pincers arm (composed chiefly of infantry divisions) or against natural obstacles, or to envelop them, and, in any case, to destroy them. Simultaneously with the advance of the armored pincers arm, infantry armies broke through to form the inner pincers and devoted themselves primarily to the annihilation of pockets of troops cut off by the outer Panzer pincers arms. To sum up, between the jaws of the closing pincers--in this case two pairs, an outer and an inner--the enemy is crushed. Or, in the other figure of speech, when the wedges meet, the trap is closed and the enemy is exposed to total annihilation.

TWO "MOSCOW" ARMIES TURN TO THE SOUTH

The southern flank of von Bock's armies extended from the apex of his advance at Roslavl through Rogachev to the Pripet Marshes. On the eastern end of this long flank, Guderian's Second Panzer Army faced to the south and von Weich's Second Army which had advanced in the rear of Guderian's forces, also faced south on the western end of this flank. The mission of both armies was to drive southward, capture the city of Gomel, trap the Russian forces in that area, and seize bridgeheads across the Desna. The Second Panzer Army was to protect the east flank of the southward moving forces from Russian counterattack. The Second Army was to establish contact across the east end of the Pripet Marshes with von Reichenau's Sixth Army, the most northern army of von Rundstedt's South Group of Armies. The German advance was in general over thickly wooded and marshy terrain. Prior to August 12, the Germans were advancing on the entire Russian front.

THE EASTERN ARM OF THE DOUBLE PINCERS IN THE NORTH

At the beginning of the Kiev Operation, the Second Panzer Army was in the vicinity of Roslavl, a railroad junction on the old Post Road which led south from Smolensk. Its main body apparently advanced south from Roslavl, over the only motor road leading in that direction. Soon after the advance in the new direction began, another element moved southwest, probably with the double purpose of cutting Russian supply lines and shielding more closely the Second Army's left flank. Concerning this advance, there are no available details from Russian sources, but German claims, that the Second Panzer Army rolled back the Russians by a flanking movement to the west before reaching the Gomel-Bryansk railroad, would indicate that the Panzer elements left the south road at Mglin and pushed toward Gomel. The Panzer elements which occupied Chernigov (see p. 53) probably left the Post Road further south at Starodub, but some or all of them may have left the Post Road at Mglin and may have turned south from the Mglin-Gomel road.

The Germans state that Unecha was bitterly contested. No further details are available, except that the Second Panzer Army captured the junction and pushed on to the south. Another German source states that on August 17, there was a tank battle about 130 kilometers (80 miles) south of Roslavl. This was probably the fight for the Unecha junction.

Unlike the road followed by the Second Army from Mogilev to Gomel and thence to Kiev, the Second Panzer Army's road via Unecha to Novgorod Syeversk was not a first-class road, and the available German accounts of the fighting deal in large part with bad road conditions brought about by heavy rains. According to a German source, the vehicles literally had to grind their way through deep mud. The ground was so soft, according to this source, that log roads constructed by the Germans were pressed far into the mud and rendered almost useless by the weight of the supply elements of the German columns. Since the season was summer, it appears that the drying-out of roads was rapid; in any event, Novgorod Syeversk on the Desna was reached. Here bridgeheads were at once established south of the Desna, and the Second Panzer Army was rapidly re-organized and made ready for its part in the Kiev encirclement.

THE WESTERN ARM

At the time of its right turn to the south, the Second Army under von Weichs was apparently concentrated about 100 miles west of Roslavl in the Mogilev-Bobruisk area. A part of this army drove south toward Gomel over a first-class road paralleling and east of the Dnieper. As in the case of the advance of the Second Panzer Army, no details are available concerning this drive to the south.

According to German sources, a flank attack was launched on Gomel by troops which advanced via Jlobin (in some accounts south of Jlobin) and struggled through the Pripet Marshes. Because of the difficult terrain and lack of roads, these troops, however, were probably a relatively small part of the Second Army. No road (according to available maps) leads directly from the Bobruisk area to Gomel. Even the roundabout routes were over poor roads. The road from Rogachev to Jlobin was worse than second-class; no road led all the way from Jlobin to Gorval; and the road from Gorbal to Gomel was second-class or worse. Thus German troops, by whatever route they approached Gomel from the west, faced bad road conditions.

The Second Army encircled and destroyed pockets of Russians at Rogachev and Jlobin and soon struck at Gomel. Despite a strong Russian counterattack, the maneuver, which was apparently an envelopment, was completely successful. The defenders were trapped and the city fell on August 19. According to a German source, infantry, artillery, and engineers had all played major roles; prisoners numbered 84,000; 144 tanks, 949 guns, 38 airplanes, and 2 armored trains were captured.

It appears that von Reichenau's final campaign for seizing the Brest Litovsk-Kiev railroad was not begun until after the success of the Second Army's drive was indicated. Those Russians on the railroad who could not get back to Kiev tried to escape through the marshes and across the Dnieper to Chernigov, but elements of the Second Panzer Army, which presumably had moved over the Starodub-Chernigov road, were already in that city, and the retreating Russians were trapped. Since Chernigov dominated several routes to the east, its loss was a serious blow to the Russians.

PREPARATIONS ARE COMPLETE

By August 21, the Germans held all territory north of the Desna, and both of the northern pincers arms were ready for the final phase of the operation, the advance southward below the Desna into the Russian-held Kiev salient.

While the Second Army and the Second Panzer Army were crossing the Desna into their newly established bridgeheads, other related events had been occurring. Northwest of Kiev, the holding forces of von Reichenau drew nearer to the city after the defeat of the Russians along the Brest Litovsk-Kiev railroad. Von Reichenau's forces had also approached nearer to Kiev on his south flank and, though unsuccessful in an apparent effort at taking that city, had developed strong bunker lines and other defenses behind which troops had been brought up for the Kiev holding attack. This attack, coordinated with the operations south of the Desna, was now launched. Simultaneously in the south, von Rundstedt's South Group of armies had on August 31 thrown a bridge across the Dnieper River below Kiev at Kremenchug, and had effected crossings at other places. The troops of von Kleist's First Panzer Army became the outer pincers arm and the troops of von Stuelpnagel's Seventeenth Army became the inner pincers arm of the envelopment from the south.

THE SECOND ARMY CROSSES THE DESNA

No details are available in regard to the advance south of the Desna by the German Second Army, but the road-net and the general tactical situation would indicate that some elements drove south by Kozelets toward Kiev and that others, further east, drove toward Priluki. Each of these roads was an admirable route for the Kessel part of the wedge-and-trap (Keil and Kessel) maneuver. The road via Kozelets for miles commanded the double-track Kiev-Moscow railroad, and the junction at Brovari commanded every highway available for a withdrawal from Kiev. The road via Priluki at and south of Piryatin likewise intersected important Russian roads and railroads, and continued southeast of Lubni (see below).

THE SECOND PANZER ARMY CROSSES THE DESNA

The Second Panzer Army crossed the Desna just beyond Novgorod Syeversk, the first large town inside the northern boundary of the Ukraine. The Desna, which is some 655 miles long, is the largest tributary of the Dnieper.

The river was defended by strong and extensive fortifications along the eastern and southern banks. German sources state that the bunker walls here consisted of two timbers, each 12 inches thick, with an intervening space of 24 inches filled with sand.

As the Germans advanced, the service of engineers was constantly needed. The Germans had to repair a damaged bridge across the Desna and had to build a ponton bridge over the Seim.

At Konotop where the railroad from Kiev to Moscow intersected a north-south highway, the Russians resisted stubbornly, for they realized that the loss of Konotop would not only prevent supplies from being sent to the retreating armies in the trap, but would imperil the retreat of these armies from the trap. However, the Germans captured the city and the outer armored pincers arm was free to advance the remainder of the distance across the northern half of the Kiev salient. As the advance elements moved forward, other troops came up and held the town and protected the rear.

After the Germans took Konotop, the Second Panzer Army drove straight across country toward Romni. A very heavy rain began to fall as the leading battalion entered the town. It rained continuously on September 11 and 12, and German armored vehicles had great difficulty moving in the mud. Large towing-machines and caterpillar tractors were the only vehicles which could pull out the heavy trucks loaded with fuel, ammunition, and supplies. At times the supply elements were completely out of contact with the combat elements. Even the engineers, according to the Germans, were powerless because of the mud. Drivers used tree trunks and branches, wire rolls, and wooden fences to make wheels take hold, and yard by yard the vehicles moved forward.

The bad weather did not last long, and the main body of Germans reached Romni. German tanks drove through the town and across the first bridge beyond without much trouble. However, the Russians opened fire on the unarmored vehicles following in the rear. A second bridge, at the exit of the town, was stubbornly defended by snipers with automatic weapons in cleverly built positions along the steep embankment on the far side of the river. German engineers and riflemen finally drove the Russians out of the emplacements by going around and attacking from the rear. Then the armored spearhead moved on towards Lokhvitsa, farther to the south.

As the Germans moved south they met, with ever greater frequency, Russian troops attempting to flee from the trap, the closing of which was by now obvious to the Russian commander. Some Russians escaped, but the rapid closing of the trap caught most of the Kiev defenders inside.

THE NORTHERN WEDGE MEETS THE SOUTHERN

As the Germans approached Lokhvitsa, they captured three bridges but encountered resistance. The Soviet forces made a counterattack supported by antiaircraft guns using direct fire. Some tanks and a truck with quadruple-

mounted machine guns attempted to take the bridges from the Germans. These Russian vehicles approached to within 300 yards and then their attack slowed down in the face of the fire of German antitank guns and howitzers. Since they drove back but did not destroy the attacking Russians, the Germans protected their positions by laying mine fields. On Friday, September 12, some of the German armored vehicles entered the town, and on Saturday the 13th, they pushed on to villages only some 25 miles from the northward-moving tanks of the First Panzer Army of General von Kleist.

The closing of the armored pincers was to take place without delay. On Sunday, September 14, a strong reconnaissance element of the Mark Brandenburg Panzer Division from the Berlin area, cut the Kiev-Kharkov railroad, over which supplies were brought for the Soviet armies in this area. This Panzer division continued to advance southward. By this time the advance elements of a Panzer division from the Rundstedt South Group of Armies had penetrated as far north as Lubin.

As the northern arm moved south over the last miles, it encountered Russian trucks and horse-drawn wagons. These were dispersed by fire and the advance continued. A German reconnaissance plane was overhead. Radio messages were constant. Shortly after 1430, the valley of the Sula was entered. River crossings were necessary, and dangerous highway defenses were encountered, but the heights at Luka were reached at 1620. Two hours later the advance elements reached a demolished bridge on a small tributary of the Sula. Across the stream was an armored reconnaissance detachment of a Vienna regiment belonging to the First Panzer Army of the South Group of Armies. The armored pincers arms from the north had met the one from the south. The advance continued on to Lubni.

While the advance continued south from Lokhvitsa to Lubni, a spearhead from the South Group of Armies were being driven north from Mirgorod along the highway, to Lokhvitsa. No difficulties were encountered, since elements of the Mark Brandenburg Division were already waiting for the advancing elements of the Vienna Division. The wedge operation was completed.

THE KESSEL

According to German practice, the two outer encircling Panzer arms threw out on their outer flanks enough tank elements to prevent a breakthrough by any Russian forces to the east. Troops of the inner pincers arms were enabled to devote themselves exclusively to entrapping and capturing the Russians. The Second Army elements referred to above as moving via Kozelets and Priluki had the help of Von Stuelpnegel's Seventeenth Army which moved up from Kremenchug. Crossing the Dnieper at Kiev, von Reichenau's Sixth Army also attacked the Russians who were attempting a withdrawal. Hemmed in on all sides, the Russians were soon defeated. The German mopping-up maneuvers apparently consisted chiefly in minor wedge and trap operations in any area where German forces could either encircle a body of Russians or pin it against a natural obstacle. The Germans pronounced the Kiev operation officially

concluded on September 22, and claimed that 665,000 Russians, including four or five of Budenny's armies, were captured.

The figure, however, seems excessively large unless (as is German custom) all able-bodied men in the district were counted as prisoners of war. In fact a German account intimates that women as well as men were counted in the total: "female riflemen....refused to be regarded as civilians. They were soldiers and could shoot machine guns and pistols like a man. So they had to march with the male prisoners."

CONCLUSIONS

Several conclusions can be drawn from the Kiev encirclement:

(1) A large encirclement operation is more than a simple advance by armored troops. It generally begins by an initial breakthrough toward some definite point, the occupation of which will threaten a vital line of communications.

(2) Secondary pincers movements may be expected at any point as the operation develops.

(3) Emergencies must be met by subordinate commanders on the spot by intelligent action in harmony with the general plan.

(4) Superiority in the air, superior mobility on the ground, and smoothly functioning radio communications are absolutely essential.

(5) Supply and vehicle maintenance agencies must be prepared to cope with unusual and often precarious situations. Security must be carefully planned and vigorously executed.

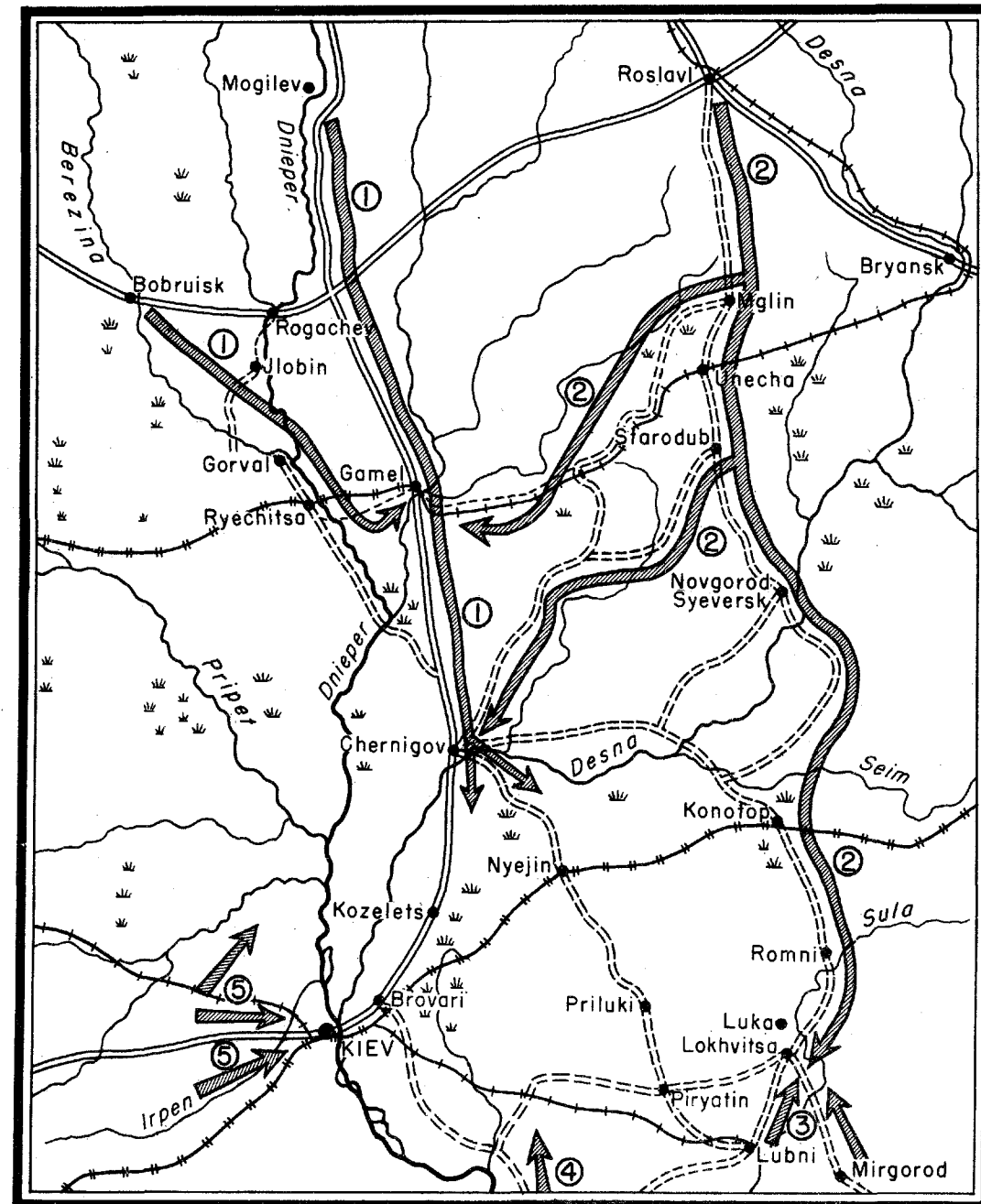
(6) From German accounts it would appear that Panzer forces often operate with calculated recklessness and without flank protection. These forces in fact operate ahead of the main body, but a study of an operation will usually reveal that the exposed flank of the rapidly moving units is protected by natural obstacles or by adequate forces assigned to this mission, or by both.

(7) An important principle of the successful encirclement is the application of greatly superior combat power at decisive points. The German plan was to immobilize, surround, and annihilate units before they could be thrown into action.

(8) The fundamental steps in the German plan of operations may be summed up as follows: first, to locate the enemy through reconnaissance and espionage; second, to disrupt enemy communications by air power; third, to concentrate decisively superior strength at vital points, with full use of secrecy, deception, and speed of execution; fourth, to encircle and annihilate the hostile forces.

MAP LEGEND

1. Approximate routes of the Second Army of von Weichs.
2. Approximate routes of the Second Panzer Army of Guderian.
3. Spearheads of the First Panzer Army of von Kleist.
4. Spearhead of the Seventeenth Army of von Stuelpnagel.
5. The holding attack of the Sixth Army of von Reichenau.



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|----------------------------|-----------------------------------|
| == ROAD (first class) | +++ RAILROAD (two or more tracks) |
| ----- ROAD (second class) | ++ RAILROAD (single track) |
| ----- TRAIL (or poor road) | ← GERMAN DRIVE |

25 0 25 50 MILES