CHAPTER 12

SPECIAL OPERATIONS

SECTION I

ATTACK OF A FORTIFIED LOCALITY

GENERAL

■ **774.** A fortified locality may comprise a single, strongly organized position. It may consist of a series of strongly organized positions disposed in great depth and breadth in such manner as to be mutually supporting. In either case, its main battle position will be composed of camouflaged, mutually supporting, concrete and steel fortifications which may or may not be connected by underground passages and protected by obstacles.

The main battle position will be outposted by a system of concrete and steel artillery, automatic-weapon and troop emplacements, tank traps, and obstacles disposed in great depth to the front and flanks. The reduction of such a locality by direct attack may be costly in men, ammunition, and matériel. Such an attack offers little prospect of success unless the attacker has accomplished a high degree of technical training and has a great superiority, especially in tanks, engineers with special equipment, artillery, and combat aviation.

Whenever possible, fortified localities are reduced by siege or by an attack from the rear following an enveloping maneuver to accomplish their complete isolation. When because of secure flanks their isolation is impossible by an initial enveloping maneuver, they must be reduced by direct attack to break through at a weak point. The break-through is followed by envelopment of the flanks created, to isolate the separate parts.

■ **775.** The attack of a fortified locality may be divided generally into four phases. In application, related phases may overlap, particularly on weaker parts of the front. Immediate exploitation of the success of each phase is imperative.

These phases are:

a. Reducing the hostile outpost system and gaining close contact with the main position.

b. Breaking through the fortifications at the most favorable point.

c. Extending the gap by isolating and reducing hostile emplacements on its flanks.

d. Completing the action by moving mobile reserves through the gap to complete the encirclement and isolation of remaining fortifications while continuing the attack against them from the front.

■ 776. The principal differences that distinguish a break-through of a fortified locality from the penetration (see pars. 468–472) of any other hostile position are the relatively greater special training and combat superiority required; the absolute secrecy and thoroughness of preparations; the types of special equipment and troops required; the frontage subjected to initial assault; and the action subsequent to the complete break-through and isolation of a fortified locality.

PREPARATION AND PRELIMINARY OPERATIONS

■ 777. Air supremacy is the first requirement for operations against a fortified locality.

■ 778. Reconnaissance determines the extent of the main position and its outpost system in depth and breadth; the location of dead angles and character of emplacements, artillery and antiaircraft artillery positions, tank traps and obstacles, and observation posts; those approaches which can be covered most effectively by the hostile defenses and those which afford the greatest advantage to the attacker and those areas in rear of the locality which favor action from the rear after a break-through has been effected. Reconnaissance involves the employment of observation and combat aviation, highly mobile ground reconnaissance units containing engineers, and sound and flash ranging and signal intelligence units. Air photographs are taken of the entire locality at successive intervals to determine the initial hostile defenses and the progress of any changes being effected therein. Important localities are outlined heavily and indicated clearly on the photographs; copies are distributed to commanders down to and including the smallest combat units which are to operate in the area covered, together with

such intelligence summaries as are needed by each echelon of the command. These reconnaissances are continued throughout all phases of the operations.

■ 779. Based on the results of reconnaissance and the task assigned, the commander determines what special troops, equipment, and combat power will be needed to break through the hostile outpost system; he organizes his command into its tactical groupings and assigns missions to each.

The organization of the command into tactical groupings provides for self-sustaining combat units down to and including battalions, so that each echelon of attacking troops will be able to exploit local successes promptly without reference to the next higher unit, and facilitate the advance of adjacent units whose progress is not so rapid. Plans provide for the utilization of every available agency of signal communication.

■ 780. The attacking echelon in the preliminary operations is composed of infantry; chemical troops to lay smoke and open lanes through contaminated ground; engineers with demolition equipment for the destruction of obstacles, mine fields, and hostile emplacements, and equipment and material for the repair of roads and bridges and assistance to tanks; guns of high muzzle velocity and flat trajectory, such as antitank and antiaircraft guns; special troops with flame-throwers and other means of destruction; and such tanks as are necessary and can be spared for the operation without weakening unduly the effort required in the subsequent attack against the main hostile fortifications. Specially selected groups of these troops and weapons are organized into assault detachments.

■ 781. Training of special assault detachments is carried out by having them rehearse the contemplated operation on terrain and against fortifications similar to those to be encountered. The size and number of assault detachments needed in the preliminary operations depend on the size and number of emplacements which must be reduced. Each tactical grouping must have enough trained assault detachments with sufficient special equipment to insure the reduction of all emplacements in its zone of action.

■ 782. Sufficient reserves are disposed in concealment behind the attack echelon to insure success and to meet hostile reaction.

Sufficient artillery of all calibers required to reduce the outpost system supports the attack echelon. Artillery of the heavier types assists the preliminary operations by constant bombardment of the hostile main position, paying particular attention to fortifications from which hostile artillery can bring fire upon troops engaged in preliminary operations.

Reinforcement by combat aviation employing heavy bombs is important. Combat aviation supports the action of the attacking echelon, continues operations against the hostile main position, and performs other missions.

Hostile elements defending the intervals between emplacements must be neutralized.

■ 783. Plans for this phase of the operation must assure coordination and cooperation between all means and methods and must not disclose which part of the main hostile position will be struck later by the main attack of the whole force.

■ 784. Movement to attack positions is accomplished under cover of darkness, fog, or smoke.

■ 785. All forces not required in the preliminary operations are held concealed beyond the range of hostile artillery, and continue training and preparations required for the attack against the main fortifications.

■ 786. The advance through the hostile outpost system is a step-by-step process, determined by the progress of the assault detachments. It must be rapid enough to prevent the enemy from reestablishing the continuity of his front by recoordinating his fires or by counterattack.

■ 787. Fire of heavy artillery and supporting bombardment aviation is directed upon emplacements, massive obstacles, mine fields, and wire obstacles and entanglements. The fire of lighter, flat-trajectory weapons and of flame-throwers is directed against loopholes in emplacements to neutralize the hostile weapons and widen the apertures. Flat-trajectory artillery with high muzzle velocity using direct laying is employed to penetrate armored turrets.

The assault detachments, screened by smoke and taking advantage of accidents of terrain and dead angles of fire, push through and around emplacements under protection of the fire of all available supporting weapons and other troops in the attack echelon.

The assault detachments are protected by fires placed on other localities from which hostile reaction may interrupt their movement, especially flank positions and troop emplacements not being attacked.

Engineers and other troops destroy obstacles, mine fields, wire entanglements, tank traps which are not destroyed by artillery and bombardment aviation, and other light obstacles which may impede the advance. They prepare crossings necessary for the supporting armored vehicles and weapons.

■ 788. When the fire of heavy artillery and bombardment aviation fails to destroy the emplacement and open the way for destruction of remaining hostile personnel by assault, the emplacement is reduced by demolitions placed by engineers or other special troops. Under cover of supporting fires, the assault detachment advances close to the emplacement; final selection is made of the exact location and route thereto for each demolition to be placed, and the preparation of each demolition is completed. Vital spots for demolitions are *the tops of open emplacements; the loopholes;* just under or alongside the loopholes, at the base of steel doors and windows, and within sharp angles of emplacements with heavy overhead cover; and *on top of emplacements with light overhead cover.* Nonpersistent chemicals, smoke, and thermite also are thrown with demolitions through the tops or through loopholes. Scaling ladders may be necessary in placing demolitions through loopholes or on the top of a high emplacement.

■ 789. When all is in readiness for the assault, signal is given for supporting fires to lift. When supporting fires are lifted, troops detailed to place the demolitions rush forward immediately, cut or blow lanes through any remaining wire, and place and arm their demolitions under protection of smoke, and then take cover. Light demolitions and grenades are thrown through loopholes or through the top without regard to coordination with the firing of heavier demolitions. When the demolitions open the way into the emplacement, the assault troops rush the position and overpower hostile personnel remaining active. Hand grenades, thermite bombs, and light demolitions complete the destruction of bays not neutralized by the first demolitions. When the emplacements are small or of light construction and no longer are obstacles, the assault may be supported by tanks. In the assault of

emplacements which cannot be penetrated by tanks, these weapons best support the action by moving rapidly around them to engage hostile troops attempting to escape and to block the movement of hostile reserves.

■ 790. After the assault of an emplacement, time is taken only for essential reorganization, security elements are pushed forward rapidly, and the advance is continued. When the assault results in prolonged hand-to-hand fighting, local supports are rushed forward to assist the assault echelon. In anticipation of the assault, reserves and local supports are moved up close to the assault lines, disposed to favor their rapid passage through the attack echelon to continue the advance in the event the assault results in serious disorganization. Any halt is dangerous because of the speed with which a local hostile counterattack can be organized and launched, supported by weapons which are already in position and highly coordinated. Small isolated resistances which have been passed over are reduced by special mopping-up detachments from supports and reserves.

■ 791. During the assault, supporting fires are concentrated on those hostile targets which constitute the greatest danger to the success of the assault and a renewal of the advance; special attention is directed toward locating and bringing prompt fire to bear on any hostile mechanized and local reserve elements forming for counterattack. When the advance is resumed, supporting fires conform to the movements and needs during the advance to the next emplacements.

■ 792. During the advance to the next emplacements, units are reorganized as completely as time and facilities will permit; any additional personnel, equipment, and material needed against the next emplacements are sent forward. Necessary adjustments in groupings, of plans of maneuver, and of plans of fire are effected.

■ 793. The speed and regularity of the advance through the outpost system depends in a large measure on the degree of coordination maintained by the commander after the assault of the first emplacements.

Effective signal communication is vital. Liaison between tanks, artillery, the attacking troops, and supporting bombardment aviation is maintained by all possible means of signal communication including radio telephone in the clear.

Liaison officers, extensive wire nets, motor messengers, airplanes, relay runner stations, visual signal stations, and advance message centers are employed in ample numbers to insure timely transmission of information and orders.

Once the operation is initiated, a failure of signal communication must not result in the halt of a tactical grouping whose advance is still possible. When a commander knows the plan of advance through the outpost system and his unit is making progress, he halts in the absence of orders only when he *knows* that his continued progress will endanger unduly the plan of his superior commander.

■ 794. Operations to complete the destruction of the hostile outpost system continue until the main position definitely halts the advance. During these preliminary operations, the general duties of reserves, artillery, and of engineers and special troops not with the attack echelon are the same as for any other type of attack.

THE BREAK-THROUGH

■ 795. While the preliminary operations are in progress, preparation for the penetration of the main fortifications is continued. New air photographs of the position and intelligence summaries are issued as necessary. All equipment, weapons, assault detachments, and other troops to be employed are in readiness to move forward to positions under cover of darkness, fog, or smoke by the time the preliminary operations are completed.

■ 796. The main position will ordinarily be composed of a series of mutually supporting major works, protected by minor gun emplacements, tank obstacles, troop emplacements, and wire entanglements disposed in front of and between them to cover dead spaces which automatic weapons cannot reach from the main fortifications. The front of initial penetration of such a position is carefully selected; it will frequently be determined by the existence of terrain and roads which favor the employment of armored forces in the break-through and exploitation. The dead angles within and between the main fortifications are sought out with particular attention to covered approaches thereto.

■ 797. The width of the front of penetration is limited by the amount and types of artillery and bombardment aviation

available, the capabilities for tank or armored force employment, and the number of trained assault detachments available with proper equipment.

■ 798. In preparation for the penetration, trained assault detachments are organized into a composite unit under a highly resourceful and energetic commander. They are moved into position opposite the selected front. Other units of the division occupy the assigned zone of action as in any other attack. Additional assault detachments are assembled in reserve, close behind the front of the composite unit, to extend the gap of the penetration by operating against the flanks and rear of other fortifications thus exposed.

Arrangements provide for direct signal communication between the composite unit and supporting artillery of all calibers and supporting bombardment aviation. The contemplated action is rehearsed several times. Every man must know the details of his immediate task.

■ 799. Troops transported by aircraft may be landed within and in rear of the larger fortifications on the front of the main attack, to block the movement of reserves and to assist the assault troops by attacking the fortifications from the rear.

■ 800. The amount of ammunition, artillery, and bombardment aviation available, the degree of surprise possible, and the depth of the fortifications on the front of the penetration will determine the length and intensity of preparatory fires prior to the assault. In any event, bombardment of the whole front by artillery and aviation continues from the opening of the preliminary operations. At some time prior to the hour of attack, the bulk of all supporting fires, ground and air, is concentrated on the fortifications on the front of the initial penetration. Bombardment aviation attacks hostile reserves, artillery, and sensitive points in the fortifications which artillery cannot or does not reach. Heavy and medium artillery is concentrated on points in the fortifications which offer the greatest danger to success of the penetration. The fire of flat-trajectory weapons is directed against lighter obstacles and loopholes in the fortifications. Smoke is used extensively to screen the front of attack.

■ 801. Protected by rifle and light machine-gun units, engineers move forward under the preparation fires and open

lanes through undestroyed wire, remove obstacles, blow the mine fields, and prepare crossings over streams, tank traps, and obstacles. Chemical troops open lanes through contaminated areas which cannot be avoided. The composite unit advances as close to the front of penetration as possible, completes its detailed preparations, and waits for the fires to lift. Frequently it will be possible for it to advance well into the gaps existing between the main fortifications during the preparation and destroy minor emplacements before the assault on the principal works.

■ 802. Preparation fires on the front of penetration are lifted on a time schedule or on signal from the commander of the composite unit, depending on orders from higher authority. The bulk of the preparation fires then shifts to the next fortifications to be reduced or is placed to meet hostile reaction to the initial assault. Fires are maintained against fortifications not subjected to assault.

■ 803. Once a breach has been effected and the emplacements on the initial front reduced, additional assault detachments are sent into the gap at once to attack the flanking works in each direction and widen the base of the penetration while the composite unit deepens the penetration by advancing and attacking the next fortifications in its zone. Troops in rear of the composite unit are pushed rapidly through the gap created.

■ 804. Because of the location of the flanking fortifications and troops within or nearby, the enemy is able to organize and launch a strong counterattack with great rapidity. Delay in attacking the flanking fortifications and reinforcing the advance of the composite unit may result in a serious reverse and the loss of the composite unit by hostile counterattack. Troops confronting the flanking works move to the support of the assault detachments as rapidly as fortifications are neutralized.

By breaking the continuity of the enemy front, the coordination of his mutually supporting fires is broken. His extensive signal communication system permits the enemy to reestablish rapidly the continuity and coordination of fires covering his front. Hence, once a breach has been effected its immediate exploitation is imperative.

■ 805. The operations are continued until the entire front selected for a major break-through is reduced. As the attack progresses, the flanks of the penetration are defended against hostile counterattacks and to protect the passage through the gap of troops assigned to exploitation and rear-attack missions.

■ 806. The assault and reduction of a major fortification are accomplished generally in the same manner described for the destruction of a minor emplacement in the outpost system. The only fundamental differences existing between the two are the size of assault detachments, the frontage of initial operations, the additional means required for major demolitions.

■ 807. Only a commander who is actually present at a point of crisis can exercise a direct influence upon the attack echelon. A division or lower commander must be well forward from the time the attack is launched until a complete break-through is effected.

During the attack, much of the coordination originally ordered will fail because of the fluctuating fortunes on the front of attack. This condition will become more pronounced as the gap is widened and the penetration deepened. The initiative, vigor, and boldness of subordinates must be allowed full play. (See pars. 125 and 507.)

■ 808. When the fortified locality has been breached throughout its depth, highly mobile units are immediately pushed through the gap under the protection of troops holding the shoulders of the penetration, of troops landed by air in rear of the fortifications, and of combat aviation. Mechanized forces lead the way. Once through the gap, mechanized forces spread out fanwise, moving rapidly on all roads leading toward the hostile rear and toward the rear of fortifications not reduced, to disrupt hostile lines of communication, destroy signal communication, to block the movement of reserves, and to complete the demoralization of the enemy. Closest cooperation by and coordination with supporting aviation is demanded. The principal targets for bombardment aviation are hostile reserves, signal communication installations, and isolated resistances attempting to block the movement of the exploitation forces. Following the lead of the mechanized forces, the remaining troops of other

arms in the exploiting force move rapidly to complete the isolation of the remaining fortifications and assist in the complete destruction of the hostile field forces. Since it must be expected that the enemy will attempt to close the gap, suitable forces must be assigned the mission of keeping it open.

SECTION II

OPERATIONS AT RIVER LINES

GENERAL

■ **809.** Owing to the restrictions which they impose upon movement and maneuver, wide and unfordable rivers exercise considerable influence on military operations. They constitute obstacles to an attack and natural lines of resistance for defensive and delaying action. They assist in screening against hostile ground reconnaissance and in providing security against hostile mechanized attack.

The attack across unfordable rivers requires *special preparations,* both technical and tactical, proportionate to the size of the river and the relative strength of the opposing forces. Data relative to rivers in the theater of operations are contained in maps, air photographs, and terrain studies furnished to the commander of the field forces. These data are supplemented by research conducted throughout operations.

■ **810.** *Reconnaissance* of a river line is essential both in attack and defense. The strength of a river line increases with the width and depth of the river and the velocity of the current. Other considerations with a tactical and technical bearing are the banks, the topography of the adjacent terrain, islands, and tributaries, the river bottom, the approaches to the river bank, the practicability of fords, and the danger to be expected from ice floes and freshets.

Streams, ordinarily of little tactical significance, may become formidable obstacles as the result of freshets, high water, or dam construction. In winter, troops may cross on ice of sufficient thickness. On the other hand, ice conditions may increase greatly the difficulty of crossing.

Streams with soft bottoms and steep or marshy banks are obstacles in varying degree to mechanized units.

■ 811. Close *support* by *combat aviation* is essential in all large offensive operations at river lines. Local air superiority is gained and maintained during the operation.

ATTACK TO FORCE CROSSINGS

■ 812. The defenses of a river line can sometimes be outflanked. By demonstrations (strong in artillery and air activity) carried out at various points on the river line, an attempt is made to deceive the enemy as to the projected point of crossing, while a strong mobile force makes an unopposed crossing elsewhere and launches an attack to envelop the hostile flank before the enemy can readjust his dispositions.

When the enemy is not actually holding a river line, an effort is made to anticipate him in the possession of the necessary crossings. Mobile forces are advanced quickly on a broad front to seize the desired crossings and to occupy the dominating terrain on the far side in order to protect the crossing of the main body.

■ 813. Troops transported by air and mechanized and motorized units may be employed to seize and hold important crossings until the arrival of leading elements of the main forces.

■ 814. When the enemy is already in possession of a river line which cannot be turned, the crossing must be forced. Under favorable conditions, a river crossing may be forced by rapid and audacious methods. This is accomplished by a bold attack by troops transported by air and by mobile ground forces strong in armored vehicles, bridge equipage, and fast motor boats, strongly supported by bombardment aviation. These forces seize the bridges before the defenders can complete their destruction. If the bridges have been destroyed, the covering forces are put across in motor boats. At the same time bridges are constructed rapidly under hostile fire and the initial surprise so gained is exploited fully.

In the absence of such favorable conditions, a more deliberate operation is required. Hostile troops are promptly driven across the river, and systematic preparations to force a crossing are initiated.

■ 815. In an operation involving the crossing of a river, the actual crossing is a means, not the end sought. The immediate

purpose is to get across quickly and economically and establish a bridgehead which will protect the crossing of the remainder of the command.

In establishing a bridgehead for a large force there are usually three successive objectives on the enemy side of the river: first, a position which will eliminate effective, direct, small-arms fire from the crossing front; second, a position which will eliminate ground-observed artillery fire from the selected ponton bridge site(s) and which can be supported by light artillery on the attacker's side of the river; third, a position which will eliminate all artillery fire from the bridge site(s) and will provide the necessary maneuver space on the enemy side of the river for the command. Attainment of the first objective facilitates the crossing of succeeding troops by assault boats, foot bridges, and troop and vehicle ferries. Attainment of the second objective, coupled with air supremacy, normally will make possible the construction of ponton bridges to cross the bulk of heavier loads. Attainment of the third objective, coupled with air supremacy, gives uninterrupted use of crossing means over the river, permits the protected maneuver of troops in furtherance of their mission, and facilitates the accumulation of supplies on the enemy side of the river.

The assignment of river crossing objectives or missions to units must allow sufficient freedom to subordinate commanders so that successes can be fully exploited.

■ 816. *Reconnaissance* of river lines across the routes of advance is begun by staff and engineer officers at an early stage of the operation. Air photographs showing the nature of the river and the bridge destructions effected by the enemy enable the commander to make an early estimate of the possibilities of crossing and the means required. Ground reconnaissance of the river line can be executed ordinarily only after hostile covering forces on the near side of the river have been driven across the river.

Reconnaissance provides detailed information and furnishes the basis for the selection of the crossing points and the execution of the necessary preparatory measures. Based on the results of reconnaissances and on the tactical situation, decision is made regarding the front or fronts on which the crossing will be forced.

■ 817. In general the attacker should operate *on a wide front* with several determined attacks at separated localities. Secrecy in preparation and deception of the enemy as to the time and place of the main crossing are essential. Feints, deceptive use of smoke, or demonstrations are employed to deceive the enemy. (See par. 820.)

■ 818. In the selection of crossing fronts and the crossing points, both tactical and technical requirements are considered.

Tactically, the attacker seeks concealment for his movement to the river, concealed final assembly areas, a long stretch of river bordered by trees or low hills, undefended crossing points, and good avenues for advance, especially roads, on the enemy side of the river. Dominating ground on the attacker's side of the river favors artillery observation and support of the attack by overhead fire. A salient in the river line toward the attacker favors concentration of combat power and flanking fire on enemy troops defending the salient. While the attacker of this type of salient can rest his flanks on the river after crossing, he may be forced to attack on a narrow front to break through a strong defense at the base of the salient.

Technically, the attacker seeks a moderate current, a water area unobstructed by islands, bars, and reefs, suitable shores, good approaches on both banks, and easy connection to the existing road net. Old bridge sites frequently are advantageous.

■ 819. Having selected the front or fronts on which the crossing is to be made, the higher commander formulates his *plan of action* for the crossing.

■ 820. Tactical groupings are assigned to each *crossing front* and are given instructions regarding time of crossing, objectives, zones of action, assistance to adjacent units, and type and location of bridges to be constructed. Other troops may also be assigned to make *feints* or *demonstrations* at points other than the main crossing fronts so as to deceive the defenders and to draw them away from the main crossing fronts.

A portion of the command is held in *reserve* to exploit the most successful crossing.

■ 821. *Engineer troops and matériel* must be made available early in the planning stage of the operation so that reconnaissances can be made and equipment prepared and properly disposed. Engineer troops with the necessary ferrying matériel normally are attached to the leading combat teams making the crossing on each front. In addition, a reserve of engineer troops and matériel must be provided to erect bridges or to assemble raft ferries, to reinforce the means of crossing at decisive points, to replace losses, and to do other engineer work such as maintenance and extension of the road net.

■ 822. The *unit engineer* is charged with all technical preparatory measures for the crossing and for the distribution of engineer troops and matériel, the construction and guarding of bridges, and the regulation of traffic thereon.

The location of *engineer matériel* prior to the crossing (particularly ponton bridge equipment) must be carefully concealed. Discovery of its presence may disclose the plans of the commander to the enemy. It forms a remunerative target for hostile airplanes and artillery and should be given antiaircraft defense.

The command post of the unit engineer is connected by signal communication troops with the command posts of the superior commander and the commanders on each crossing front.

■ 823. As soon as a tactical group is assigned to a crossing front, its commander and the commanders of troops supporting the crossing on that front direct staff and subordinate officers to reconnoiter the ground over which they will operate, to locate routes of approach, final assembly areas, actual crossing points and routes thereto, and to prepare plans for schedule fires and other details of the crossing operation. In the execution of reconnaissance, restrictions imposed in the interest of secrecy must be observed.

Signal officers reconnoiter the front of crossing for existing wire lines on the near side of the river and determine the need for additional wire lines. They also determine the possibilities of the extension of these lines on the far side. Prior to the crossing radio communication is prohibited or reduced to the minimum in order to preserve secrecy. Once the crossing has been initiated, radio usually is relied upon for communicating with units across the river until telephone lines are established.

■ 824. When the necessary preparations have been made, the superior commander gives the order for the *execution of the crossing.* (See FM 101–5.)

■ 825. The *hour of crossing* is determined by the superior commander. It is more difficult to load and cross boats during darkness than during daylight. This difficulty may be more than offset by the security and secrecy afforded by darkness. The crossing may be timed so that sufficient force to attack the first objective reaches the hostile bank just before dawn. The advance to this objective will then have the advantage of daylight.

■ 826. Shortly preceding the crossing, the bulk of the troops to make the crossing is placed secretly in *concealed bivouac* out of hostile artillery range but within easy night marching distance of their crossing fronts. A minimum of artillery may occupy concealed positions and fire for registration. For purposes of secrecy all artillery may be silenced. Only covering forces and the necessary reconnaissance parties are permitted to approach the river. Covering forces along the river are designated from troops other than those to make the initial crossing.

■ 827. Ordinarily all supporting troops go into position under cover of darkness on the night of the crossing. Leading assault units move to *final assembly areas* where they are met by engineer troops with assault boats, footbridge, or other crossing means.

Final assembly areas have the following characteristics: accessible for trucks which bring up engineer matériel, defilade, easy identification, concealment from air and ground observation, and several direct and concealed routes to the crossing points.

■ 828. The *first assault waves* on each front, led by engineer guides, carry their assault boats from the final assembly areas to the water's edge and launch them on a broad front. Lateral movements and the massing of troops at the river bank are avoided. Measures are taken to regulate traffic and to suppress noise during the movement to the river. Upon arrival at the crossing points troops embark immediately and are ferried to the far bank where they disembark, overcome any enemy resistance near the bank, and proceed to the first

objective. Departures from the final assembly areas are timed to permit leading units to cross simultaneously on a broad front, but once these units leave the final assembly areas they do not halt and no attempt is made to maintain alinement between boats. Normally, there is no firing from the boats when the crossing is made under cover of darkness.

The movement from final assembly areas to the far shore is under control of the engineer troops.

■ 829. The engineer crews return the assault boats to the near shore for the *second wave*, which has moved from its forward assembly area. If the current is swift, allowance for drift must be made in fixing time or place of meeting the boats. If boats are to be reused, allowance must be made for probable losses during the crossing of the first wave. It may be necessary for *succeeding waves* to carry additional boats, or for engineers to furnish individual ponton boats or raft ferries to carry these waves.

■ 830. *Footbridges* may be used for crossing first waves over narrow streams. Their construction is difficult under small-arms fire. Ordinarily they are used to cross succeeding waves of foot troops, particularly after the first objective has been attained.

■ 831. *Ponton raft ferries* are provided to cross vehicles which will be needed before it is practicable to build the ponton bridge. Ferry construction usually is practicable after the first objective has been seized. Ponton raft ferries often are continued in use after the bridge is built to serve as an alternate crossing means and to handle return traffic.

■ 832. *Alternate plans* are prepared for exploiting success on any crossing front by assigning troops from other fronts or from the general reserve to cross on the front where the crossing has been most successful.

■ 833. In addition to the fires of organic weapons, the crossing of tactical groupings is supported by artillery, combat aviation, smoke, and the fires of supporting weapons of the general reserve.

■ 834. Supporting fire may be opened several hours prior to the initial crossing against an enemy prepared to resist in a well organized position, or may be withheld until after the crossing is discovered, in order to obtain surprise.

■ 835. The *artillery* gives close and continuous support to the advance. As soon as the assault waves advance from their first objective, the artillery begins displacement of individual batteries across the river. Later the mass of the artillery is advanced, the displacement conducted in such a manner as to assure continuity of artillery support. Artillery observers and liaison groups, with the necessary means of signal communication, accompany the assault units during the crossing and advance to the objectives.

■ 836. *Antiaircraft defense,* both by ground units and aviation, is centered around the crossing fronts and particularly the ponton bridges. A portion of the automatic weapons of the antiaircraft defense is crossed to the far bank by boat or ferry before construction of the bridges is started. Continuous protection for the bridges is maintained as long as required.

■ 837. *Smoke* can conceal river crossing operations from ground observation but ordinarily not from air observation. It frequently is used during daylight hours in connection with feints or demonstrations in addition to concealing the actual crossing of the initial waves. The use of smoke places additional importance on the marking of embarkation points and bridge sites and the routes leading thereto.

■ 838. The first objective having been taken and supporting infantry units having been brought up behind the initial wave, the attack is continued without delay on the second objective. Since this objective is selected in order to deprive the defender of his ground observation of the river, considerable resistance may be expected. Aggressively used, mechanized units may be effectively employed at this time.

■ 839. The second objective having been taken, or the hostile light artillery neutralized, the superior commander normally directs the *construction of the ponton bridge* (or bridges). The greater the number of bridges made available, the quicker and surer the crossing. The construction of bridges from local materials requires much time and labor. Quicker results are obtained from the use of ponton equipment.

Alternate bridge sites are selected in advance. Transferring operations to an alternate site after the equipment is unloaded at the first site is a time-consuming and difficult

operation. Decision for such a move rests with the superior commander.

■ 840. The bridge having been completed, the remainder of the artillery and other troops are crossed and a coordinated attack, if necessary, is made on the third objective. If construction of a bridge should prove impracticable, the passage of all troops and equipment is by ferry. When the third objective has been attained, subsequent operations may be of an offensive or defensive nature as the situation may demand.

■ 841. *Control* during the crossing and advance to the first objective is mainly a responsibility of the leaders of small units. Capture of the first objective gives an opportunity for the next higher commanders to resume control and direct the attack on the second objective. Since the capture of the second objective usually is followed by the construction of ponton bridges and the crossing of artillery and the remainder of the troops, the superior commander may direct a coordinated attack on the third objective. The period of delay on each objective is as brief as possible. Every effort is made to conduct operations in such a way that the third objective will be seized and held in the minimum period of time. Signal communication is maintained initially by radio between forces on the opposite sides of the river. Later, wire lines may be laid across the river and wire communication established between the principal command posts.

■ 842. Armored divisions, cavalry divisions, and other *mobile units* effect river crossings by advancing rapidly and boldly to seize the necessary crossings and bridgeheads on the enemy's side of the river. If this is impossible, they effect wide detours to weakly defended or undefended points on the river and then cross. If all crossings are destroyed, horse cavalry units may swim and armored or mechanized units may be ferried until bridges can be constructed.

DEFENSE AGAINST CROSSINGS

■ 843. An unfordable river may be employed as an obstacle in front of a defensive or delaying position, or as an aid to defensive-offensive action which seeks to strike the enemy while his forces are astride the river. A river line loses much of its value as an obstacle if the enemy is not forced to make a direct attack; it becomes an obstacle to our own

troops if successful counteroffensive action is to be followed by an exploitation.

Holding a river line in such force as to leave available insufficient reserves destroys the flexibility of the defense and exposes it to immediate defeat as soon as the river line has been pierced.

■ 844. The commander must insure the complete *destruction of all bridges* and *fords,* which cross the river within his sector, to prevent them from falling intact into the hands of the enemy. The actual destruction is usually a mission of the unit engineer. Unless specifically forbidden by higher authority, any bridge or ford may be destroyed. When it is considered desirable to preserve such crossings until the last possible moment, full authority to complete their destruction is delegated to any member of the bridge or ford guard. When it is apparent that the crossing cannot be kept from falling into enemy hands, *it must be destroyed.*

■ 845. A river may be used as an obstacle directly in front of the main line of resistance of a position. (See sec. II, ch. 10). The river bank positions are held in strength; adequate reserves are provided to intervene at decisive areas. Such a defense is possible only when large forces are available on the front to be held and the enemy is unable to turn or avoid the position. It subjects the troops in forward areas to the full force of the enemy artillery preparation.

Emplacements are so located that the opposite bank and its approaches are held under fire and the enemy's attempts to cross are frustrated in their beginning. Salients in the river line and open terrain dominated by the enemy are lightly held but are capable of being covered by the concentrated fire of weapons.

The *artillery* is employed as in the defense of a position, except that a part may be placed well forward to cover the most likely crossing places, the enemy's probable assembly positions, and avenues of approach. The artillery must be prepared to concentrate its fire against the main crossing when it is discovered.

Tanks are held in reserve to be employed against those hostile elements which have gained a foothold on the friendly side of the river and constitute the greatest threat of the integrity of the position.

■ 846. River lines may be defended by *defensive-offensive action.* (See sec. IV, ch. 9.) Unless the situation and the strength of the available forces indicate the advisability of holding the river line as a line of resistance, it is best usually to hold the mass of the forces in readiness at such distance to the rear that it can intervene promptly at any point where a crossing in force may be attempted. The river line then is held by relatively weak detachments. Stronger detachments with local reserves are posted at the most probable points of crossing. The operations of the advanced detachments are organized in accordance with the doctrines governing outposts. It is their mission to force the enemy to disclose the full power of his supporting fires, to discover hostile crossings, and to prevent hostile troops from establishing themselves in bridgehead positions before the arrival and attack by the general reserves.

■ 847. In defensive-offensive action, some artillery may be attached to the outpost detachments. The mass of the artillery is held in readiness prepared to support the attack. It is then so emplaced that it can concentrate its fire in the critical area and support the attack in the decisive direction. Since the mass of the hostile artillery will still be on the far side of the river, much importance attaches to the neutralization of hostile air and ground observation regulating the enemy's artillery fire.

■ 848. In defensive-offensive action, the attack of the general reserves is made as soon as the hostile main crossing is recognized. The plan for this action is prepared beforehand. Success depends upon the commander's ability to launch the attack at the proper time and in a decisive direction. It must be launched before the enemy has established himself in a bridgehead position. To this end, efficient signal communication must be assured and reserves must be prepared to move promptly and rapidly.

The mobility of the troops held in reserve is increased by the assignment of motor transportation.

Decisive results are promised by the prompt employment of mechanized units and combat aviation against hostile units which have already crossed the river and by air attack of bridges and of troops engaged in ferrying operations.

■ 849. In any defense of a river line *covering forces* remain on the enemy's side of the river to maintain contact with the enemy, delay his advance, and determine his assembly positions and probable crossing places. When forced to retire, these advance elements withdraw across the river. Timely measures are taken to destroy the crossings after the last elements have withdrawn across the river, or at such earlier time as may be necessary to prevent the crossings from being seized by the enemy. On wide rivers, after the covering force has withdrawn, contact with the enemy may be maintained by use of patrol boats.

■ 850. The primary missions of the *engineers* are to destroy fords, bridges, and matériel which may assist the enemy in crossing; to reconnoiter the terrain along the river; to assist in organizing the ground; and to keep the roads in condition for rapid movement of reserves. Engineers also block with obstacles and mines the hostile avenues of approach to the river, embarking points, and landing points. Floating mines, rafts, and fireboats may be prepared and held in readiness upstream. Preparations are made for illuminating the water area at night.

■ 851. *Combat aviation* operates against ferrying and bridge equipment before it reaches the river; against ferrying and bridging operations; against troops assembled for crossing; against hostile artillery; against hostile aviation, and supports the main attack of the general reserve.

■ 852. *Signal communication* is established so as to insure rapid communication with the outpost and covering forces and the quick transmission of orders to the reserve and the artillery. Multiple wire circuits are laid along alternate routes to increase the probability that some of them may escape damage from the heavy fire anticipated.

■ 853. *Cavalry* units are employed initially on reconnaissance or security missions on the enemy's side of the river. Later they protect the flanks of units on the river or are held in mobile reserve.

The principal mission of the *antiaircraft* artillery is to protect the reserves and the artillery. Preparations are made to reinforce rapidly the antiaircraft defense in critical areas. Sound locators and searchlights are of great value in detecting and illuminating hostile crossings.

■ 854. In a *retrograde movement* when the river line is to be held as a defensive or delaying position, the retiring columns cross at the available bridges which are not under hostile artillery fire. If the crossing places are insufficient, the construction of additional bridges or ferries may be necessary. Antiaircraft defense is established on both banks of the river line to protect the bridges and crossing places.

Trains, motorized columns, and a part of the artillery cross first. Routes leading to and from the bridge approaches and crossing places are plainly marked. Staff officers with detailed instructions for march sequence and future action direct units to their destinations. Traffic is regulated strictly during the retirement across the river. Bridges and fords are destroyed to prevent them from being seized by the enemy and arrangements are made to ferry the last elements of the covering forces.

As soon as it has moved across the river, the artillery which crossed early is placed in position to protect the crossing places and cover the retirement of the remainder of the command. This echelon later is reinforced by the remainder of the artillery after it has crossed the river. At the earliest practicable moment, a plan of artillery defensive fires is prepared which will take advantage of the long range and flexibility of artillery fire to lay down interdiction and counterpreparation fires on the hostile routes of advance and assembly positions.

■ 855. The river may lie *in rear of a defensive position.* This is equivalent to defending a bridgehead and the position selected should eliminate all enemy artillery fire from the bridge sites and provide the necessary maneuver space. An even greater distance from the river may be desirable in order to find suitable terrain and to allow space for retrograde movements during the conduct of the defense. Plans must be made for withdrawal across the river.

SECTION III

NIGHT COMBAT

■ 856. Night combat is characterized by a decrease in the effectiveness of aimed fire and by a corresponding increase in the importance of close combat and the fire of fixed weapons laid on definite targets or areas by day; by difficulty in

movement, troop leading, and the maintenance of direction, cohesion and signal communication; and by a more highly sensitive morale of the troops.

Decrease in the effectiveness of fire permits the use of closer formations without exposure to excessive losses; difficulty in the maintenance of control and direction necessitates limited objectives which may be approached by well-defined routes; the more sensitive morale of the troops increases the effects of surprise obtained by the offense and the importance of security measures on the part of the defense.

Fog or smoke produces conditions of combat similar to darkness. Because of the uncertain duration of a fog and the amount of ammunition required to establish and maintain smoke concentrations, operations based on concealment provided by fog or smoke require rapid execution.

■ 857. An unexpected collision of troops at night, or combat which extends into the night, usually develops into a standing fire fight and a suspension of movement. As a rule, night combat can be conducted successfully only when there is time for the preparation and distribution of a well-conceived plan and for thorough reconnaissance by all leaders during daylight.

■ 858. In night combat, the influence of unit commanders on their troops is greatly diminished. Tactical operations and troop leading are surrounded with greater difficulties; the uncertainties of combat exercise a greater influence than in daylight operations.

■ 859. *Night attacks* are made to complete or exploit a success, to gain important terrain for further operations, to avoid heavy losses which would be incurred by attacks in daylight over open terrain, or to attract hostile reserves.

■ 860. Simplicity of plan, careful preparation, secrecy, surprise, and cohesion in execution are prerequisites to a successful night attack.

■ 861. *Surprise* is the most essential feature of night attack. Preparations for night combat, whether made during daylight or darkness must avoid betraying the locations or intentions of the troops. The operation itself must be conducted with precision and secrecy.

■ 862. The difficulties of night attacks increase with the size of the command. They therefore usually are undertaken only on a limited scale and with limited objectives.

■ 863. Night attacks are made preferably by fresh troops or by reserves of troops in contact with the enemy. The best available troops should be used. When made by troops already in contact with the enemy, many details of execution are left to the commanders of front-line units.

Night attacks are often the manifestation of an aggressive leadership, which is determined to bring about a conclusion without delay. Morale of the troops and quality of the leadership, especially in the lower grades, rather than numbers, are likely to measure the success attained.

When fresh troops are designated to make a night attack, their approach march is protected by troops already in contact with the enemy.

■ 864. The *hour* at which a night attack is to be made depends upon the object sought. The exact hour of attack is kept secret as long as possible.

An attack launched during the first hours of darkness frequently strikes the enemy before he has had time to organize his position or his artillery support. It may also anticipate possible night operations on the part of the enemy. It may be delivered after victorious combat in order to frustrate the enemy's attempts to organize a withdrawal at nightfall or to consolidate a position for defense.

An attack during the last hours of darkness may be advantageous as a preliminary operation to a general attack at daybreak because it gives the defender no time to reorganize.

■ 865. The decision to attack should be made while there still is sufficient daylight to make all preliminary reconnaissances and preparations. Reconnaissance should include observation of the terrain at dusk, so that both the day and night aspects may be studied. Easily identified direction points are located and provision is made for guides.

■ 866. Subordinate commanders are carefully instructed concerning the terrain, the objective, and the direction of attack. Routes of approach are carefully marked, guides are provided, and compass directions are given.

■ 867. *Orders* for night attacks are formulated with more than usual detail. Routes of approach, assembly positions, line of departure, and objectives are designated with the utmost exactness. Orders include the rate of advance; the formations to be employed; means for mutual identification of troops; measures for flank protection and for maintenance of direction and contact; the composition, initial position and mission of the reserve; the course of action to be followed in case of success; the signal for withdrawal in case of failure, and a rallying point for each subordinate unit in case of withdrawal. Precise and detailed instructions for maintaining secrecy are issued; the use of lights is forbidden; rifles are generally left unloaded; bayonets are fixed; vehicles and animals are left at assembly positions and other measures to insure silence and secrecy are prescribed. The time of attack may be included in the order or may be announced later.

■ 868. In the conduct of night attacks, only the *simplest formations* are employed. Normally, the smaller units advance in column until close to their objectives, when dense skirmish lines are formed and the enemy is rushed with the bayonet without firing. Each column is given a definite direction and objective. Contact is maintained between columns and every precaution is taken to avoid their collision.

The assaulting columns are followed closely by their supports and local reserves.

The supporting weapons of the attacking force may be placed in position for flank protection of the initial assault. When the terrain is favorable for overhead fire, they may be emplaced in a rearward position to support the attack on signal or to cover a withdrawal. The advance to the objective is so timed as to permit close support of the assaulting troops at daybreak.

General reserves are held generally well in rear and preferably on a flank, prepared to move promptly to the objective or to cover a withdrawal.

■ 869. The particular circumstances attending each situation usually will indicate whether the assault should be prepared by artillery fire. Where *artillery support* is indicated, a short but violent preparation generally will suffice. This preparation is lifted on a time schedule. The artillery holds itself

in readiness to intervene promptly and energetically in accordance with a prepared plan of fire to box off the zone of attack or to cover a withdrawal. The artillery neutralizes located hostile artillery.

■ 870. On capturing their objectives, units are reorganized and promptly disposed to meet a counterattack. Their further conduct is prescribed in the attack orders.

■ 871. In night combat, the *defense* has the advantages of better knowledge of the terrain and of organized defensive fires covering the principal avenues of hostile approach.

■ 872. Vigilant outguards, active patrolling well to the front, and illumination of the foreground must be relied upon to give timely warning of attacks. Gaps that cannot be covered effectively by fire from adjacent units are occupied at night by elements in support. When a hostile attack is suspected or known to be in progress, supports and local reserves are brought closer to the main line of resistance.

■ 873. Obstacles and the fire of fixed weapons are the principal means used in breaking up the assault. Small-arms fire is opened as soon as the alarm is given and combat outposts have been withdrawn. Local supports and reserves, using the bayonet only, counterattack, preferably the enemy's flanks.

■ 874. Night *raids* may be used to capture personnel, obtain identifications and determine details of the hostile position, and especially any major changes in the enemy dispositions.

When a *raiding force* has accomplished its mission, it withdraws on a previously arranged signal. A route of withdrawal other than that employed for the advance is used if practicable. During the withdrawal, the reserve of the raiding force is utilized to cover the withdrawal and to protect its more vulnerable flank. Fires of the artillery and other supporting weapons are employed to neutralize the enemy advance elements and supporting weapons. The artillery neutralizes located hostile artillery.

■ 875. As a rule, delaying action at night can be executed only by small units or detachments which operate and retire along well-defined routes. Rearward movements are regulated carefully to avoid losses by fire from friendly troops in rear.

When the enemy possesses great superiority in combat aviation, daylight maneuver of large units may be impracticable. Disorganization and delay of advancing hostile ground columns may be accomplished by the night attack of small groups against marching columns, bivouacs, billets, or motor parks.

SECTION IV

COMBAT IN TOWNS

■ 876. Towns offer concealment for troops and weapons and protection from fire of weapons and mechanized attack. Consequently, they are often naturally strong defensive areas. On the other hand, they are conspicuous topographical features of which exact details are either available or readily obtainable. Fires started by hostile incendiary ammunition may make towns untenable.

■ 877. Combat within the limits of a town is characterized by reduced effectiveness of fire and observation, by increased importance of close combat, and by difficulty in control of troops. Fighting is at close range, and the outcome depends largely upon the initiative and aggressive leadership of subordinate commanders.

■ 878. A town strongly held by the enemy may be taken by fixing the garrison by a holding attack while so directing the main attack as to isolate the town from the support of neighboring defensive positions. When immediate capture of the town is essential, the main attack is directed against the flank or rear of the town in order to secure the advantages of enveloping attack. When frontal attack cannot be avoided, the attacker concentrates on the capture of the near edge of the town by the methods applicable to the attack of any organized position and then reorganizes his effort to continue the advance through the town. The action within the town necessarily is decentralized to subordinate infantry leaders since lack of observation of the action precludes satisfactory centralized control. The attack is pushed rapidly through the town to capture quickly the exits on the far side. Assault units are freed from the responsibility of mopping up the town.

■ 879. The larger the town and the longer it has been held by the enemy, the more thorough must be the preparations

for attack. Visual and photographic reconnaissances determine the defensive organization of the area and the nature of defensive works and furnish pertinent data to all elements participating in the attack.

■ 880. When the enemy has organized the town into a strongly fortified position which cannot be avoided or outflanked, the advance may have to be made frontally, strongly supported by artillery, combat aviation, and other supporting weapons. When the fire of the supporting artillery and other supporting weapons is lifted, the assault echelon pushes through the defensive area in a series of bounds; supports and reserves mop up and organize the area for defense against hostile counterattack. The attack is continued through the town to the far side in a similar manner.

■ 881. Bombardment aviation is of first importance in reducing a stubbornly defended city. Destruction is methodical and ordinarily progressive from front to rear.

Mechanized troops are of little value in combat within a defended town. Their use for such combat will probably result in excessive casualties, both in personnel and vehicles.

■ 882. In the *defense,* towns often are included in the organization of the defensive position, especially when mechanized attack may be expected.

In organizing a town for defense, the main line of resistance is established within or in front of the town. After clearing the fields of fire, its defensive capabilities are developed by organizing the outlying buildings and enclosures to form salients from which the front and the flanks of the town can be covered by flanking fire. Obstacles then are constructed within the town and groups of buildings are organized defensively to oppose any effort to penetrate.

■ 883. To prevent the enemy from passing by on either side of the town and effecting capture by attack against the flank and rear, a *mobile reserve,* strong in mechanized units, is held outside the town in a concealed position, prepared to break up the enemy's outflanking maneuver.

■ 884. Towns are favorable to delaying action as they keep the attacker in ignorance of the strength of the forces confronting him and provide concealment and cover for screening the withdrawal.

SECTION V

COMBAT IN WOODS

■ 885. In many respects, combat in woods is similar to that in towns (sec. IV). Often, in combat in woods, observation and control of troops are even more difficult than in towns. Some woods, owing to their size or location, are naturally strong defensive areas. Other woods, however, may have little or no defensive value and may even be advantageous to the attacker by providing concealed routes of approach into the defensive position. Small woods are avoided as they are clearly marked and draw fire.

■ 886. The *attack* usually seeks to avoid isolated wooded areas included in the enemy's defensive position by passing them on either or both flanks while neutralizing their edges by fire or smoke. The artillery blinds the enemy's observation by smoke and neutralizes the hostile weapons that are capable of delivering flanking fire against the attack. During dry weather incendiary bombs are highly effective. Small wooded areas may be neutralized with chemicals.

■ 887. If avoiding the woods is impracticable and their possession is necessary, the attacker seeks to capture the woods by enveloping action. When enveloping action is inexpedient, the woods are attacked frontally. The attack is directed first against the salients which are neutralized by the fire of the artillery and other supporting weapons, reinforced by that of combat aviation. This supporting fire is maintained until the assault echelon is ready to rush the salients, when it is lifted to the reentrants of the woods, or to suitable targets within or on the far side of the woods.

The near edge of the woods is carried like any other position and then is used as a line of departure for the advance through the woods. The dispositions to be taken for this second phase of the attack depend largely upon the character of the woods. In sparse woods, formations are employed resembling those on open ground, but with greater density in the leading echelon. In dense woods, small columns are more effective in the leading echelon. Measures are taken to insure direction, cohesion, and signal communication between the columns. Supports are formed in column and closely

follow the assault units. The vulnerability of the flanks to attack requires special measures for their protection.

■ 888. All commanders must be watchful to prevent combat groups from assembling on or near roads and trails since these will be covered by the enemy's system of defensive fires. The enemy's strong points are outflanked by an advance straight through the woods off the roads and trails. To avoid confusion and to prevent friendly troops from firing into each other, it may be necessary to regulate the advance by bounds. Reserves are disposed so that they will not become involved in the fighting of the assault echelon and can be engaged where the greatest progress is being made.

■ 889. Before debouching from the woods and while still far enough from the edge to be concealed from the enemy's view, the command is disposed for fighting on open ground, and arrangements are made for support by the artillery and other supporting weapons. As the edge of the woods presents a well-marked target for hostile fire, the attacking forces make their egress rapidly to seize an immediate objective beyond the edge of the woods. Whenever possible, this objective should mask the edge of the woods from hostile ground observation and small-arms fire.

■ 890. The movement of combat vehicles is regulated so as not to block the routes of advance through the woods. If the woods are not too extensive, vehicles are held on the near side until the attacking echelon has reached the far side.

■ 891. As a *defensive position,* the edge of the wood has the objection of presenting a clearly-defined target to the attacking forces. The main line of resistance is therefore usually established either in front of the edge, or within the woods. Since a position in the interior of the woods has the disadvantages of restricted view and limited field of fire, the observation elements of the outpost are advanced close to the edge of the woods. The routes forward and to all positions in rear are reconnoitered and made known to all concerned.

While holding up the attacking units by means of obstacles, the defense seeks to break up the cohesion of the attacker's dispositions, lead him into false directions, and take the attacking troops under flanking fire. Natural or cleared lanes through the woods assist greatly in the development of flank-

ing machine-gun fire and in detecting and holding up a hostile advance. Supports and local reserves are posted with a view to counterattack against the enemy's flanks. Full advantage is taken of the opportunities for ambush, surprise, and counterattack.

In wooded areas, close support by artillery becomes difficult. Fields of fire of all flat-trajectory weapons are extremely limited. The fire of high-angle weapons is not equally affected; a little clearing will permit howitzers to be used.

■ 892. When there is a possibility that the enemy may launch his attack on either side of a wooded area, preparations are made to repel the hostile groups with flanking fire from the flanks and salients. Combat groups are located in the area outside the woods to oppose the enemy's outflanking maneuver. Tanks held concealed in the woods, with routes reconnoitered and prepared, will add power to the counterattack of the defender.

■ 893. Numerical superiority is of little advantage in the close combat which usually develops in fighting in woods. When close contact is imminent, bayonets are fixed and preparations made to engage the enemy with rifle and machine-gun fire and to meet him in hand-to-hand combat with hand grenades and the bayonet.

SECTION VI

MOUNTAIN OPERATIONS

GENERAL

■ 894. Mountainous terrain offers no insuperable obstacles to the conduct of military operations, even in cold weather, if troops are properly *equipped, clothed, supplied, and trained.* In general, mobility is retarded, movement is restricted, firepower and fire effect are reduced, and signal communication and supply are more difficult.

■ 895. Mountain warfare is characterized primarily by difficulties which terrain offers to movement. The inaccessibility of certain regions restricts areas in which troops are able to operate. The restricted nature of certain areas such as narrow valleys and defiles limits the strength of forces which can be maintained and moved therein. The inadequate road net found in sparsely settled mountains enhances the military

value of existing roads, adds importance to heights which dominate them, and slows down the operations.

Key terrain features consist of heights which dominate valleys and lines of communication with observation and fire; passes which permit movement through mountains; and roads and railroads which must be secured for supply purposes.

■ 896. In *mountain combat* the commander is limited by terrain as to the means which he may employ. Success depends more upon proper adaptation of available means to the terrain than upon their power. Maneuver of small units and the initiative and leadership of subordinate commanders are of the highest importance in mountain warfare. They are favored by the concealment which is available for movement, by the diminished effect of firepower resulting from defilade, and by facilities for observation. The plan of maneuver for the force as a whole is more closely subject to considerations of terrain than in ordinary regions. The problem often resolves itself into a matter of striking hostile routes of communication and of defending one's own routes. The actions of small semi-independent units in seizing or defending heights which dominate lines of communication or of fighting to seize or block passes and other defiles on routes of communication become of increased importance.

■ 897. When formulating plans for operations, possibility of sudden changes in weather must be considered. Arrangements are made for frequent periodic weather reports. Alternate plans are prepared to provide for changed weather conditions.

■ 898. Terrain difficulties and rigors of climate may, especially in winter, render tactical considerations subordinate to those necessary for providing troops with shelter that is indispensable for their conservation.

■ 899. The theater in which the forces are to operate will necessitate special equipment to fit the climate, the character of the terrain, and the type of hostile forces to be encountered. They should ordinarily have a preponderance of high-angle fire supporting weapons; a high percentage of pack transportation; an adequate amount of radio and visual signal communication; and a high degree of logistical self-containment.

Necessary specialized training includes use of skis and snow-

shoes, visual signaling, parachute jumping, use of both pack and motor transportation, mountain climbing, use of the gas mask in rarefied atmosphere, and marksmanship.

■ 900. Decentralization of operations is characteristic of mountain warfare. Tactical groups usually operate semi-independently within terrain compartments in order to carry out the plan for the force as a whole.

■ 901. *Infantry* is called upon frequently to operate without support of artillery or other arms. Infantry operations are more fatiguing than on ordinary terrain.

Machine-gun units seldom find fields of fire which permit them to utilize full grazing effect. The sharp relief offers opportunities to support advancing infantry with overhead fire. Machine guns are suitable for defense of a pass or for placing barrages in valleys. Mortars and grenades attain increased importance due to the increased amount of deflade.

■ 902. *Cavalry* may include both mechanized reconnaissance and horse elements. The missions of mechanized elements include distant reconnaissance to the front and flanks, flank protection, and seizure of distant defiles which can be held by, or in which delay can be effected by, small units with considerable firepower. Horse elements are employed on similar less distant missions; some are attached to tactical groups for reconnaissance and security purposes. Cavalry may be held as a mobile reserve.

■ 903. The howitzer is best adapted for *artillery support* in mountainous terrain. Ordinarily flat-trajectory cannon can be used only at long ranges because of the necessity of clearing masks and reaching objectives defiladed by steep slopes. Horse-drawn and motorized artillery units are emplaced near the roads; pack artillery is capable of following foot and mounted elements and taking defiladed positions in the more difficult terrain overlooking the valleys.

Control of artillery is decentralized.

Because of the difficulties in the conduct of artillery fire with air observation, greater dependence is placed on ground observation in mountainous terrain. Observation posts must be reconnoitered and established early and provision made for liaison observers with the forward echelons to assure close and timely support.

The effectiveness of counterbattery is diminished because of the difficulty of locating hostile batteries. The effectiveness of interdiction fires is increased because of the number of definite points which the enemy is compelled to pass.

■ 904. The importance of *engineers* increases with the difficulties of the terrain. Maintenance of existing roads and construction of new roads are of primary importance. The existence of numerous sensitive points on the few highways facilitates demolition and increases their effect. The difficulties of access to certain positions frequently necessitate use of aerial tramways in a stabilized position. The rocky soil requires employment of explosives for constructing even the simplest of entrenchments.

■ 905. The hazards of flying in mountainous regions place a great restriction on the use of low flying *combat* aviation. The restricted road net often offers a favorable opportunity for bombardment aviation to block critical road junctions and to attack troops in defiles.

Many occasions arise for employment of parachute troops. Such occasions include seizure of an important distant defile, and quick movement of a force to operate against the hostile flanks or rear.

■ 906. Mechanized units suffer so many restrictions in mountainous terrain that their effective employment is generally very limited.

■ 907. *Antitank* units are especially effective in the mountains as their weapons are easily placed and hidden, and mechanized vehicles are confined to a few avenues of approach and the nature of the ground may make their progress slow and difficult.

■ 908. The operations of the *signal units* are affected by the scarcity of commercial wire lines, by difficulties of laying wire, by "dead spaces" in radio reception, and by terrain barriers between adjacent corridors in which troops are operating. Great reliance is placed on radio, visual signaling, and messengers.

The command post of a small unit usually is located near the observation post of the unit. Command posts of regiments and larger units should be near road centers, and, if practicable, near a landing field.

RECONNAISSANCE

■ 909. *Reconnaissance* in mountain warfare is facilitated by the restriction of enemy movements to the available road net and by numerous defiles, but it is made difficult by changing weather conditions, rugged terrain, and the concealment and cover available for hostile troops. The apparent impossibility of certain areas must not lead to the conclusion that they are inaccessible to hostile troops.

Maps of mountainous regions seldom are accurate. A correct knowledge of the terrain can be gained only by a study of the ground itself, supplemented by a study of air photographs. The employment of reliable local guides may be advantageous.

Aviation primarily seeks information along routes of communication, especially at defiles and at valley intersections.

Mechanized reconnaissance vehicles are pushed out for distant reconnaissance; however, absence of alternate routes and suitable turn-arounds offers them little opportunity for escape when surprised and ambushed. Horse cavalry patrols can utilize trails for reconnaissance purposes.

Ground observation is unusually important in mountain operations because of decreased efficiency in air observation. Some observation posts offer very distant views and afford opportunity for extended lateral observation. Observation is subject to sudden blinding due to atmospheric changes. Observation posts are echeloned in altitude as well as in width and depth.

Offensive reconnaissance executed by specially trained detachments, operating in difficult areas which often are weakly guarded, will produce excellent results. The capabilities for reconnaissance and counterreconnaissance by small elements operating with boldness should not be overlooked.

Close reconnaissance is conducted by dismounted patrols equipped with radio and visual means of signal communication. It is initiated early and pushed well to the front. It is tedious and fatiguing but may be facilitated considerably by use of local guides.

MARCHES

■ 910. All available roads and trails are used for movement. Since displacements within tactical groups or columns are

difficult during the march, the march order of units must be such as will facilitate their entry into action.

■ 911. The rate of march in mountains is influenced by the elevation above sea level, steepness of slopes, and other factors. The rate of marching and the rate of climbing of well-seasoned troops is not greatly affected by changes in elevation of less than 5,000 feet above the altitude to which they are accustomed; greater increases in altitude cause sharp reduction in marching and climbing rates.

The total time required in marching and climbing under favorable conditions on fair roads and trails is approximately the time required for marching the map distance plus 1 hour for each 1,000 feet of ascent.

When frequent steep slopes are encountered, greater distances between foot or animal elements are required.

Rests depend upon the mission, the length and difficulty of the march, and the condition of the troops. On long marches, frequent short rests may be taken in addition to the customary regular halts.

At a distance from the enemy, effort is made to utilize favorable routes in valleys in order to reduce fatigue of troops. Motors and air transport sometimes may be used for rapid displacement of reserves.

In *winter,* travel may be possible only for specially equipped foot troops, as support artillery and pack trains may be completely immobilized. In such cases bombardment aviation may be an effective substitute for artillery, and transport aviation or dog teams may be the only means of supplying marching columns.

■ 912. *Security on the march* calls for special measures due to the distant observation which may be available to the enemy, slowness of movement, increased possibilities of surprise by ambush, and terrain restrictions on the movement of flank security detachments. Tactical groups usually will march in terrain corridors separated by terrain obstacles which deprive them of mutual support. Establishment of all-around security for each tactical group is necessary.

Special measures which afford security in mountains include movement by bounds of the main body and the advance guard; seizure of the opposite and the lateral crests previous to the entry of a column into a valley; dispatch of

detachments, including troops transported by air, to seize critical points of the terrain to assist the advance through or egress from the mountains; utilization of darkness and fog; utilization of defilade in the area subject to hostile observation and fire; employment of rear guards even during an advance; and protection by combat aviation.

Because of the difficult routes followed by flank security detachments and the fatiguing nature of their operations, it is usually necessary to provide relieving detachments at lateral or branch valleys. Consideration must be given to the fact that such detachments are ordinarily unable to rejoin their units until after the completion of the march.

■ 913. When contact becomes imminent, advance guards, exploring all routes in their zones of action, endeavor to seize terrain objectives which will cover the deployment of the main bodies. Because of slowness of movement of troops developing for combat, advance guards will act independently for longer periods of time than is the case on more normal terrain.

■ 914. It is difficult, and as a rule unnecessary, to obtain *security at the halt* with a continuous screen of outposts. A more effective method is to send out detachments to occupy heights in the principal directions from which the enemy might fire on the main force. It is advantageous to send small groups well out to occupy dominant observation posts and defiles in order to discover the advance of the enemy from afar and thus gain information of the enemy's strength in time for it to be of use. The mountainous terrain enables these detachments to effect greater delay than in normal terrain.

The interior guard of all camps and bivouacs is arranged with special care. Enemy detachments may infiltrate through security dispositions in areas which are difficult to guard and succeed in making deep incursions into a bivouac area.

OFFENSIVE COMBAT

■ 915. In *attack,* action of the force as a whole usually will be frontal with its several tactical groups operating in adjacent terrain compartments or corridors, all of which lead to the objective. Tactical groups fight under the almost complete discretion of their respective commanders. Their

operations are aimed at defiles in their zones of advance which either are objectives in themselves or which must be passed in reaching assigned objectives. The successful forcing of one defile usually will open the way for flanking action against other defiles, thereby forcing the enemy to abandon his position and at the same time blocking his withdrawal and retreat. (For attack of defiles, see section VIII.)

In difficult mountain terrain, the reinforced battalion is ordinarily the largest unit which can be employed as a unit in the attack.

■ 916. Because of the importance of lines of communication, *objectives* are usually terrain features such as passes or heights which control hostile lines of communication or from which the enemy can dominate friendly lines of communication by observation and fire.

■ 917. The commander influences the action by deciding at the outset where he intends making the *main attack.* Usually it will be in the terrain compartment which offers the best opportunities for flanking action by small units, effective supporting fires, and the most advantageous approach to a decisive objective. Tactical groups in adjacent terrain compartments make secondary attacks or feints. The commander disposes his reserves primarily to favor reinforcement of the main attack. When the terrain permits, reserves are so located as to be able also to exploit the success of secondary attacks.

■ 918. *Surprise* is facilitated by the exceptional deflade and dead space which the mountains afford and which frequently permit a debouchment at a short distance from the enemy. Surprise is completed by action of small detachments operating in areas which are difficult of travel and appearing on the flanks or in rear of the hostile position. The possibilities of transporting troops by air for this purpose may often be exploited.

■ 919. *Boundaries* between tactical groups lie as a rule along crests which delimit terrain corridors or compartments in which separate tactical groups are operating. Boundaries, however, are not strict delimiting lines of zones of action. The unit first arriving at an important point near a boundary should capture it.

■ 920. Within its terrain compartment, each tactical group makes its *main effort* along the crests and slopes or by a combined advance along heights and valleys. It is particularly important that early possession of the heights on each side of the defile assure protection to troops operating within the defile.

Infantry units advance by bounds, employing infiltration and enveloping action. They seek to outflank and capture hostile strong points on successive spurs and ridges. Supporting weapons of both infantry and artillery direct their fire to neutralize the enemy's observation and strong points.

Artillery with each tactical group furnishes close support.

Bombardment aviation complements artillery by assisting it in counterbattery missions and by bombing hostile reserves and supply installations.

■ 921. The *flanks* of tactical groups are protected by terrain obstacles supplemented by the action of detachments acting either as flank guards or as liaison detachments with adjacent combat teams.

■ 922. In addition to the possibilities of surprise which they offer, *night attacks* present special advantages. They avoid losses which would be incurred by attacks in daylight across ground that is slow and difficult for the advance with insufficient supporting fires and carried out under observed fires of the defense. The sharpness of relief lines facilitates maintenance of direction in the night attack. (See sec. III.)

■ 923. The success of each tactical group is exploited to the utmost by *pursuit*. When the location of the reserves and the terrain permit, it is reinforced. It pushes rapidly and deeply in the designated direction and initiates lateral movement against hostile forces which are holding up adjacent tactical groups whenever conformation of the terrain offers access to adjacent terrain compartments. It is this lateral action against the lines of communication of the enemy in adjacent terrain compartments which will cause withdrawal of the enemy to become general and change the action from exploitation of a local success by one tactical group to a pursuit by the whole force.

In addition to direct pressure exerted on the withdrawing enemy, every effort is made to delay his retreat by bombard-

ment aviation and to block him by the action of encircling forces to secure terrain objectives which bar the hostile avenues of retreat. Encircling maneuvers may be difficult to organize because of lack of mobility. However, small detachments of foot troops relieved of all excess equipment may be used; at times small detachments of cavalry may be able to effect the encircling maneuver. In deep snow, ski troops may be effectively employed. Key terrain features on the enemy's route of withdrawal may be suitable objectives for troops transported by air.

DEFENSIVE OPERATIONS

■ 924. In *defensive operations*, dispositions are based on the mission, on the routes of advance open to the enemy, and on the possibilities offered by a combination of difficult terrain and fire effect for breaking up the hostile attack.

The defense seeks to retain heights which dominate, by observation and fire, hostile routes of communication and approach. It also seeks to deny the enemy access to passes or other defiles which, if lost, will render defended heights untenable.

■ 925. *Defensive positions* usually comprise a combination of heights and defiles. In defending heights, positions forward of crests are difficult to screen from hostile observation. Steepness of the slopes and the defilade caused by sharp relief may make the establishment of bands of fire with flat-trajectory weapons impossible. On the other hand, positions on forward slopes lend themselves to long-range barrage and interdiction fires by flat-trajectory weapons and for a long-range observation system. Reverse slopes often fail to afford adequate fields of fire for automatic weapons. An assault on a reverse slope position by an enemy organized at close range in front of the crest may be expected. It often is possible to combine the advantages of forward slopes, crests, and reverse slopes. If the forward slope is too steep, the depth of the position may be increased by utilizing spurs extending toward the front to establish advanced elements of the position which are capable of flanking fires. At times two successive crests can be included in the position.

In defending passes or defiles the defense attempts to support its flanks on impassable obstacles on adjacent heights.

It takes full advantage of observation from the slopes of these heights, and pushes the flanks of the position forward on them in order to gain reciprocal flanking fires in front of the position. For other methods applicable to the defense of defiles, see section VIII.

■ 926. *Demolitions* and *chemical agents* assume increased importance to the defense. In favorable terrain such as passes and other defiles, contaminated demolitions are capable of blocking the advance of all arms except infantry detachments without vehicles. Their effect may endure for long periods of time.

■ 927. The *outpost* of a defensive position usually has good routes of withdrawal which unmask fires from the battle position. Security elements are pushed out in front of the outpost position with the missions of gaining contact with the enemy at the greatest possible distance and of gathering information which will assist the commander in disposing the elements of his command, particularly in locating his reserves advantageously.

It is important to delay the enemy as far in front of the position as possible. The more difficult the prospect of the defense of the battle position, the more important becomes this delay.

■ 928. The main line of resistance will include sectors which may be considered as almost impregnable due to difficulties of approach combined with a continuous system of fires, and sectors which are more vulnerable to attack due to the difficulty of covering them with a continuous system of fires. Extreme care must be exercised in concluding that certain terrain is impassable for the attacker since areas that actually are impassable for specialized detachments are rare. The dispositions should achieve continuity of fires across the entire width of sectors which so permit, and at least continuous surveillance over those sectors in which dead spaces render a continuous system of fire impracticable. Organization in depth is designed to prevent any deep penetration of the more vulnerable sectors.

The limited road net imposes rigidity on defensive dispositions. Once made, they are difficult to change and their proper determination constitutes one of the basic decisions of the commander.

Ambushes and a complete system of protected road blocks should form an integral part of the defense.

Reserves are held close to main routes of lateral and axial communication.

■ 929. The battle position consists of defense areas organized for all-around defense and occupying important terrain features. Gaps between adjacent defense areas are closed by connecting groups strong in automatic weapons and are covered by other defense areas on dominating terrain in rear.

■ 930. The distant observation available to the defense offers opportunities for long-range interdiction fires by both artillery and other supporting weapons. Such fires complement planned demolitions and must be coordinated with them.

Counterpreparation fires may be applied in mountains with unusual effect since careful study of the terrain will indicate almost conclusively areas in which the enemy will form for attack.

Bombardment aviation is particularly effective in preventing or delaying the maneuver of hostile reserves, particularly in their passage of defiles.

■ 931. From the beginning of the action, the defense must plan to maintain the integrity of its position by local counterattacks in case the enemy penetrates between adjacent defense areas. These counterattacks are prearranged as to direction, objective, and supporting fire so that they can be launched on short notice when the enemy is exhausted and spent in his attack. Because of the local nature of combat, a general counterattack is seldom possible. The reserves will ordinarily be held well forward.

■ 932. The rear areas of a defensive position may be subjected to harassing attacks by specialized enemy detachments able to traverse terrain which is impracticable for larger forces, or by troops transported by air. Protection from such attacks is afforded by placing security elements in positions which command areas in which hostile approach is at all probable. The security elements charged with this duty should consist of light detachments able not only to drive off the hostile forces but to pursue them and cut off their retreat.

■ 933. In *delaying action* the usual operation is to slow down the enemy by maintaining on high ground elements which threaten by fire any hostile movement along the valleys. This is combined with a series of resistances in defiles with special emphasis on blocking passes between valleys.

■ 934. The commander prescribes axes of withdrawal for tactical groups and successive positions which they are to reach as well as times of arrival on each.

The breaking off of combat by small units is facilitated by sharp relief which affords them dead space from hostile fire.

Engineer and chemical units are utilized to effect delay by demolitions and by chemicals in areas which have been coordinated with interdiction fires of artillery.

SECTION VII

COMBAT IN SNOW AND EXTREME COLD

GENERAL

■ 935. Military operations conducted under conditions of extreme cold and deep snow demand special equipment, and, preferably, special organization and training for troops designated for such operations. Severe weather conditions handicap movement and require special tactical and logistical measures for successful operation.

■ 936. The role of *infantry* remains unchanged. Movement in deep snow is difficult and slow unless special equipment has been provided and units thoroughly trained in its use.

Foot troops trained in the use of skis, snowshoes, and other special equipment can operate under conditions which immobilize other troops. In deep snow, the movement of mounted and motorized units is very difficult. For operations to be conducted during extreme winter weather, the infantry component of the force should be large.

The infantry units are organized into light self-sustained combat teams from which all weapons and equipment, unsuited to the operation, have been removed.

■ 937. *Ski troops* are especially equipped and trained for operations on skis in deep snow. Ski troops are especially well suited for use as patrols or as raiding parties against the hostile flanks, rear, and lines of communication. In

extensive winter operations, large bodies of ski troops may operate as a major force. Armament is adapted to the operations to be undertaken. In general, armament includes rifles, bayonets, a large proportion of light automatic weapons, pistols, hand grenades, and material for destroying trains and mechanized vehicles. Heavy weapons transported on sleds may be included, but when high mobility is essential these weapons usually are undesirable.

■ 938. *Horse cavalry* can be effectively employed in cold climates with little snow. Deep snow will impair its mobility.

■ 939. *Mechanized units* move across country with facility when the ground is thoroughly frozen and there is little snow. Streams and other bodies of water present no barrier when frozen to a sufficient thickness to carry the weight of vehicles. Vehicles of the track-laying type can operate in snow which is packed sufficiently to provide traction. For the successful operation of motor powered vehicles in extreme cold special equipment for starting and operating engines must be provided.

■ 940. Extreme cold affects both ballistics and matériel of *field artillery*. Snow affects mobility. It may be necessary to replace trucks by tractors, and to place matériel on runners. Horse-drawn and pack artillery are suitable in cold climates with little snow.

■ 941. In general, the role of *coastal batteries* remains unchanged. Unusual ballistic corrections may be necessary. Certain coast defense weapons are extremely effective against enemy troops advancing on ice.

Since the operations of ground troops, not specially equipped, are restricted in heavy snow to cleared roads, targets for attacks by enemy aircraft are frequently presented. The employment of all effective *antiaircraft* measures is therefore strongly indicated.

■ 942. The missions of the *Air Corps* under conditions of snow and extreme cold remain unchanged. Complete and accurate meteorological data are more necessary in air operations. Consequently in sparsely settled areas special measures may be required to augment the regularly established weather reporting service.

In many situations, detached forces can be established or reinforced by *troops transported by air,* and essential supplies, such as food, ammunition, and gasoline, can be delivered to ground troops by *air transport.*

■ 943. The principal mission of *engineers* is the maintenance of open lines of communication. Engineers may be augmented by additional enlisted men or by civilian labor, and by special snow removing equipment. Organization for this task approximates that of any well organized highway department. Engineers may be called upon to assist in the construction of trenches in frozen ground where the use of explosives is required.

■ 944. Full use is made of existing commercial *signal* installations. Radio is extremely important and the number of sets is increased. In deep snow, messenger service is by ski messenger or by sled. Shelter for operators and equipment is essential.

■ 945. *Chemical agents* which are liquid or which vaporize at low temperatures will be useful in operations of this character. Screening smokes are relatively unaffected by temperature. Agents disseminated by means of thermal generators are unaffected by temperature.

■ 946. When planning tactical operations for execution during rigorous winter weather, careful consideration must be given to the probable effects of weather upon operations, health of troops, supply, evacuation, and maintenance of signal communication. Ice, deep snow, and extreme cold modify the normal utilization of terrain features, and present unusual problems which must be solved to insure success without unnecessary casualties. Provision must be made, in particular, for the supply of warm clothing and bedding, of special types suitable to the requirements imposed by the climate. Provision must be made for hot meals and for an adequate supply of water.

CONDUCT OF OPERATIONS

■ 947. In deep snow and extreme cold distant *reconnaissance* is performed by air units and is subject to the conditions imposed by bad weather and short periods of daylight. In deep snow, close reconnaissance is best performed by ski

patrols. When the terrain is favorable, this reconnaissance can be deepened by the use of motorized sleds which are employed either independently of or in conjunction with ski patrols. Mechanized and motorized units and horse cavalry are effective when the ground is frozen and there is little snow.

■ 948. *Marches* in snow and extreme cold are executed on foot, mounted on horses, on skis, on snowshoes, by motor transport, or by a combination of these methods. With the exception of ski troops, the distance covered ordinarily will be less than that expected under more favorable climatic conditions.

■ 949. The principal problem for foot or mounted troops in snow is that of breaking the trail. Troops marching in front are relieved frequently. The trail may be broken by men on skis, by horse-drawn sleds, by tractors, by tanks, by snow plows, or by horse cavalry.

■ 950. If 1 foot, or more, of suitable snow is present, trained skiers, in open terrain, are the most mobile troops. The rate, depending on the slope of the ground, varies from about 1½ to 3½ miles an hour. For short distances with trained men it will reach 6 miles an hour. Under unfavorable conditions, skiing is very exhausting and the usual system of halts will not apply. The number and length of halts must be determined by the conditions encountered.

■ 951. The rate of movement on snowshoes varies from 1½ miles to 2½ miles per hour. Marches over considerable distances can be performed only by men trained and accustomed to the use of snowshoes.

■ 952. The possibility of movement by motor transport is dependent on the depth of snow. In 3 inches or less, motor transport without special equipment can move at reduced speeds. In snow up to 18 inches deep, motor transport can move if equipped with chains, and leading trucks equipped with lugs. In snow over 18 inches deep, a snow plow is necessary. When shuttling is contemplated, adequate provision is made for cleared turn-arounds. Tractors and half-track vehicles will experience little difficulty in any snow that is sufficiently packed to give traction. Motorcycles are of little value in any snow.

■ 953. *Security* is facilitated by the limitations which snow and ice impose upon the movement of large enemy forces. Unfavorable weather may limit air and ground observation of the enemy, but require special security measures against raids by ski troops.

■ 954. Where snow impedes movement, security forces of troops on the march ordinarily consist of ski detachments, operating as patrols.

■ 955. Security at a halt is affected by the fact that enemy movements in heavy snow, except for units on skis, are limited to roads. This indicates the need for strong detachments posted on roads, with the areas between them covered by dismounted or ski patrols. The tour of duty of sentinels, under severe conditions, may be for periods as short as 20 minutes.

■ 956. Enemy air operations may be somewhat restricted by short hours of daylight and by storms. Dense forests provide an effective screen against hostile air observation for elements not utilizing roads or beaten trails. In open snow-covered areas protection against observation is increased by the use of a white covering for clothing and equipment. Since weather conditions may limit the altitude of bombers and since the movement of large caliber guns is often difficult, the extensive use of light automatic weapons in antiaircraft defense is indicated.

■ 957. Two important factors affect measures for *antimechanized* security. First, extreme cold decreases the importance of water obstacles. However, concentrated artillery fire, air bombing, or deliberately placed demolition charges may make them either an obstacle or a trap or both. One foot of solid ice will carry light tanks and 3 or 4 feet will carry any load that can be moved by an army. Second, snow over 18 inches deep will limit or completely stop the use of wheeled combat vehicles except on cleared roads, and will hamper the operation of track vehicles.

In snow, antitank guns should preferably be mounted on runners and drawn by light tractors.

Snow trenches, revetted on the near side, are effective obstacles when frozen. On roads in hilly country, heavy boulders are effective.

Mines, unless they are properly placed, are relatively ineffective in heavy snow as the tank will press them deeper into the snow without exploding them. If used, they should be placed on a hard surface.

Attack of a tank by means of gasoline, either in bottles or in hand grenades may sometimes be ineffective in very cold weather, due to low volatility of the gasoline. If used, bottles should be thrown at both the top and bottom of the tank.

■ 958. Many chemical agents which are effective at normal temperatures are not effective in extreme cold. This is particularly true of persistent agents. However, protective measures must not be neglected.

■ 959. *Offensive operations* require special preparations, proportionate to the strength of the command and the climatic conditions. Signal communications, supply, and evacuation become increasingly difficult as the attack progresses. Careful planning and detailed preparations are essential in order to insure that the attack does not fail through lack of adequate command and administrative arrangements.

When formulating plans, the possibility of sudden weather changes must be considered and plans made to meet the difficulties imposed by such changes. Additional heavy snow may fall during the operation, thus further restricting movement and mobility. A sudden thaw may prevent cross country movement or cause troops to become cut off from adjacent friendly forces. Fogs may develop quickly, and low clouds may obscure observation. Special arrangements are made for the compilation of frequent weather reports. The plan of operations having been decided upon, it is executed promptly, being adapted to changes in weather as they occur.

■ 960. An *envelopment* by a properly equipped force offers many prospects of success. Deep snow will hinder the movement of hostile reserves, other than ski troops, to meet the envelopment.

■ 961. If practicable, the main attack is made over ground free of heavy forests and snow drifts. Terrain corridors lying between wooded areas usually are preferable to stream valleys which ordinarily contain deep drifts.

■ 962. The objectives of the attack are the critical terrain features which dominate the roads leading from the hostile

position. Seizure of such features will prevent withdrawal, reinforcement, or resupply, and will result in the eventual surrender or annihilation of the enemy.

■ 963. *Combat aviation* is employed in direct support of ground troops during the attack. Its actions are closely coordinated with the plan of attack of the ground forces. It attacks hostile troops in the open or under light shelter, reserves, artillery in position, command post installations, and troops and vehicles moving on roads within or in close proximity to the battlefield.

■ 964. The use of *mechanized forces* in the attack is dependent upon favorable terrain, which must be free of heavy forests and deep snowdrifts. When snow has drifted, hollows and depressions are avoided and the attack pushed on those ridges which are relatively free from snow.

■ 965. Because of slowness of movement *reserves* are located initially close to the probable scene of future employment. When the ground is covered by snow, the reserve should contain a large proportion of ski troops, infantry supporting weapons on sleds, and full-track or half-track type motor transport.

■ 966. In a *pursuit* in snow, ski troops, infantry transported in track-laying type vehicles, and artillery equipped with full-track or half-track type prime movers, if available, are assigned to the encircling force. Parachute or other troops transported by air are landed near defiles with the mission of blocking the retreat of the enemy by demolitions and other obstacles.

■ 967. In a *defensive* conducted in snow, every effort is made to delay the progress of hostile preparations and dispositions. By this means the defender endeavors to gain such time as is required under the conditions of terrain, snow, and weather, to readjust his dispositions for meeting the attack.

Light bombardment aviation and the fire of long-range artillery, are employed against hostile columns and transport, and troops in assembly positions. The most mobile troops and weapons are used to delay the hostile advance and development, remaining on this duty until forced to retire within the position. Ski troops are well suited for

this purpose. They are equipped with a large proportion of automatic weapons, and are supported by infantry heavy weapons and pack artillery transported on sleds or special vehicles.

■ 968. Deep snow may favor the defense due to the difficulty of movement by the attacking forces and the fact that an immobile force in deep snow can be hidden. Excellent fields of fire are provided over frozen wide streams and lakes which afford little or no cover to the attacker. Keeping the ice broken up for a distance of 20 to 30 feet from the shore will form a difficult obstacle.

■ 969. Open areas which are relatively free of snow, and heavy wooded areas favor the attacker, and are defended in strength and depth. Troops are more lightly disposed when an area has a foreground covered by deep snowdrifts. Antitank weapons are disposed in depth to cover those approaches which have the least snow.

■ 970. Ordinary entrenching tools are ineffective and the organization of a position requires special tools and explosives. The location of a defensive position on the military crest will usually be effective, as both enemy personnel and tanks have difficulty in ascending a steep slope covered with snow. When the ground cannot be excavated, or when necessary to obtain sufficient command for firing, snow trenches are used. At least 5 feet of solidly packed snow is needed for protection from small-arms fire. When a prepared position is garrisoned, it will require heated shelters.

■ 971. The most mobile troops of the defender are held in *reserve*. Because of difficulties of movement, reserves are held close to the probable scene of employment. As in any defense, the integrity of the position is maintained by counterattacks launched against the flank of any force which has succeeded in gaining a foothold within the position. In deep snow, the enemy may be unable to change his dispositions in sufficient time to meet a counterattack directed at his flank, especially when ski troops or troops equipped with snowshoes are employed in the counterattack.

■ 972. The defender utilizes every opportunity to improve routes of communication within the position. Paths are opened in snow between elements occupying front-line posi-

tions, between rear areas and front-line installations, and in the most probable directions of employment of reserves. Automatic weapons of reserve units are sited to cover these thoroughfares when not otherwise required, in order to prevent unexpected use by the enemy.

■ 973. The bulk of the forces employed in *delaying action* are ski troops, and foot troops transported in vehicles which can operate on snow-covered roads. Troops engaged in delaying action in snow are reinforced by artillery and infantry heavy weapons adapted for movement over snow. Engineers are employed effectively in creating demolitions and other obstacles to the enemy's advance. When the depth of snow is not excessive, every effort is made to impede the movement of hostile mechanized and motorized units which will endeavor to strike at the flanks and in rear of the delaying force.

SECTION VIII

COMBAT AT DEFILES

■ 974. Any terrain feature which restricts the front of advance of a force is a defile for that force. Mountain passes are a common form of defile. Defiles frequently occur in woods, towns, river crossings, lake regions, and swampy areas.

Because of their nature, defiles are comparatively easy to defend and difficult to attack.

■ 975. A defense in front of a defile, in the direction of the enemy, is employed by advance forces to permit the main body to debouch from the defile unmolested and to secure sufficient space for its deployment. Offensive action may be required to secure sufficient space. The minimum distance from the exit at which the defense is conducted depends on the range of the hostile artillery and the size of the main body. The defense may be conducted in a single position with flanks refused and protected by the obstacles creating the defile or the defender may adopt delaying action to gain the necessary time and space for the debouchment of the main body. Delaying action is particularly effective when opposed by an enemy of lesser mobility.

A defense in front of a defile is often required of a rear guard to cover the retirement of the main body through a defile.

■ 976. A defile may sometimes be defended at points *within*. The terrain within the defile restricts the front and the maneuver of both defender and attacker. Such a defense can be employed advantageously by small forces only when the flanks are secure, or when the defender's mission is solely one of obtaining limited delay.

In mountainous terrain, maximum use is made of demolitions, obstacles, and chemicals within the defile to delay the hostile advance. The enemy is extremely vulnerable to air attack while within the defile; maximum use is made of available bombardment aviation.

A position is occupied across the valley with flanks resting on the high ground. Reserves are held close to the position. Counterattacks are launched from the high ground against the attacker's flanks and rear.

A defense within the defile is often used in conjunction with a defense in rear of the defile to give depth to a determined defense.

■ 977. Defense *in rear* of a defile provides maneuver area to the defender while it closes the exit and restricts maneuver of the attacker. The defensive position is concave towards the exit with flanks resting on obstacles. The distance of the position from the exit is such that converging fire of all arms can be brought upon the attacker before and during his debouchment. Reserves are held out to give flexibility to the defense and to counterattack promptly against enemy forces which succeed in emerging from the defile. The maximum delay and disorganization of the enemy is effected within the defile by the use of covering forces, demolitions, obstructions, chemicals, and air attack.

■ 978. The manner of *forcing a defile* depends largely upon the manner in which it is held and the accessibility of the flanks. When a defile is held at or within the entrance and the flanks are accessible, the main attack is made in a direction that insures the capture of localities which command the entrance. When the flanks are inaccessible, the attack is made by penetration. When the defile is held at the exit, the attacker attempts to outflank the defense. By moving small forces through or around the obstacles creating the defile, the advance is made on a broad front to outflank de-

fended areas. The attacker debouches from the defile on the widest possible front.

SECTION IX

JUNGLE OPERATIONS

■ 979. The difficulties inherent to operations in wooded terrain (sec. V) are greatly magnified in jungle warfare. It has many of the characteristics of night combat. Movements are restricted. There are few roads or trails available; often trails must be slashed as movement progresses. Direction is hard to maintain. Control and maneuver are difficult. Ground observation is limited to short distances, sometimes to only a few feet. Air observation is extremely difficult.

To the difficulties characteristic of operations in wooded terrain are added the handicaps which attend operations in tropical climates; heat, heavy rains, insects, and unhealthful conditions.

Difficulties are in proportion to the size of the command. Good discipline and bold and determined leadership rather than numbers are essential to successful operations.

■ 980. Jungle warfare is characterized by close fighting. Artillery and other supporting weapons have only limited application. The grenade, submachine gun, semiautomatic rifle, bayonet and machete are the weapons best suited to operations in the jungle.

Jungle fighting is performed largely by infantry. The country is often too thick for the movement of vehicles. Pack transport is essential. Lack of observation limits the use of artillery. The pack howitzer is an appropriate artillery weapon but difficulties of transport limit the amount of artillery and ammunition which can accompany the columns. Combat aviation is of particular value as a supporting arm. Light bombardment aviation is used to compensate for lack of artillery. Troops transported by air may be employed when suitable landing areas are available.

Self-containment of supply in keeping with the proposed operations is necessary. The nature of jungle warfare is such that lines of communication often are vulnerable to attack. The use of air transport and parachutes for supply often will relieve the force from dissipating its efforts to guard long lines of communication.

All troops must be thoroughly acclimated before initiating major operations. The unhealthful conditions present necessitate medical personnel especially trained and equipped for tropical service.

■ 981. During the rainy season maneuver in the jungle is extremely limited, and often is impossible. Troops are bound to the roads and trails except for local actions. During the dry season, movement off trails is possible by cutting trails, by utilizing open areas and dry or partially dry stream beds.

Opening trails may be facilitated by having each unit *improve* the trail as it advances. By this method the leading cutters of the column break the trail; succeeding cutters widen and improve it. Speed and relief are gained by frequent rotation of cutters within each small unit.

■ 982. Jungle areas favor surprise and ambush by small forces. Small patrols conduct ground reconnaissance. Mounted detachments may be particularly effective. Distances at which security and reconnaissance detachments operate are decreased in proportion to the thickness of the jungle. Aviation supplements and extends the reconnaissance of ground elements. Even in close jungle terrain, air observers searching carefully at low altitudes will often be able to procure valuable information of enemy forces. Against an untrained enemy, air observation will be especially effective.

■ 983. On the march, ambush is a constant threat. Distances between elements of the force should be much less than in open country and special measures are taken to maintain contact between elements. At halts, flanks are protected by small flank detachments a short distance from the columns. Aviation is constantly on watch to detect indications of ambush.

A bivouac area must be prepared for an all around defense with suitable fields of fire. Elements of the outpost are stationed on all roads, trails leading to the bivouac area, and stream beds.

■ 984. Signal communication is extremely difficult. Visual signaling is often impossible, the use of runners slow and often hazardous, the range of radio sets may be greatly reduced, and wire circuits difficult to install and maintain.

When clearings are available, drop and pickup messages are a highly satisfactory means of signal communication. (See FM 31–20.)

SECTION X

DESERT OPERATIONS

■ 985. The character of deserts varies greatly. The surface may consist of loose sand and sand dunes, over which the marching of men and animals is difficult and the movement of motor vehicles is greatly impeded, or may have a hard surface which permits the movement of mechanical transport.

There are seldom any well-defined roads but trails generally exist between water sources. Hard desert is often passable anywhere by motor transport at considerable speed. Half-track vehicles are especially efficient. Stretches of loose or heavy sand may be made passable by the use of wire netting, canvas strips or similar means. Heavy traction tires assist wheeled vehicles in crossing areas of loose or heavy sand.

There are few landmarks and maintenance of direction is often difficult. Mirage is a constant source of error. Distances are deceptive and usually are greatly underestimated.

■ 986. Desert warfare is characterized by the dependence of movement and operations on the location and quantity of water supplies. Operations generally are based on the capture and protection of vital water sources. Denial of water facilities to the enemy often will bring about an early, successful outcome to the campaign.

When water supplies are inadequate, water must be brought from the rear by tank truck, rail, or pipe line, necessitating protection of this line of communication.

■ 987. A high degree of mobility is desirable in the forces employed. When the character of the desert permits, the speed, firepower, and comparative independence of water supply of motorized and mechanized forces make them especially useful. The number of animals in the force is held to the minimum on account of the large amount of water they require. Motorized units, mechanized units, or troops transported by air are employed to hold points of tactical importance such as water sources. When motor transport is impracticable horse or camel cavalry may be used, though the water problem will

be acute. Air operations are very effective in desert operations since concealment from air observation is difficult. Air transport is especially useful for the supply of isolated detachments. The troops employed must be thoroughy acclimated before engaging in desert operations.

■ 988. The general doctrines governing offensive and defensive operations apply in desert operations against a well-trained army. The tactics of small enemy forces accustomed to desert warfare are likely to be those of harassing the flanks and rear of columns, attempts to cut off detached parties, and attacks on poorly protected bivouacs. Such an enemy usually attempts to avoid a general engagement. By denying him water facilities, usually he can be pinned to the ground and engaged in decisive combat.

■ 989. Desert terrain is often very advantageous for a wide encircling or turning movement by highly mobile mechanized forces, in cooperation with combat aviation. Such action may prove decisive.

SECTION XI

PARTISAN WARFARE

GENERAL

■ 990. *Partisan warfare* is carried on by small independent or semi-independent forces, operating against a greatly superior enemy. The partisan operations are conducted for the purpose of harassing or delaying larger forces, causing losses through attrition, destroying signal communication, or making incursions on the enemy's lines of communication and supply.

Partisan operations may result as an aftermath of the defeat of the main forces of modern armed opponents. They may result from the intention to occupy territory or quell rebellions of semicivilized peoples. The military geography of the area may require operations in mountains, deserts, jungles, or undeveloped terrain. Special arms, equipment, and methods of operations may be necessary. The situation in each instance must be studied critically to determine the appropriate preparations and methods necessary for the conduct of successful operations.

■ 991. In *planning* partisan operations against a superior force, good information of the enemy's dispositions and movements and a thorough knowledge of the terrain and road net are needed. Large scale operations are avoided. Tactics are based on a small force striking a quick blow with surprise against isolated detachments and unprotected columns or convoys. Raiding parties operating against the enemy's rear carry supplies and equipment essential for an absence of several days.

The plan of the commander provides for assembling the bulk of the command after each enterprise to prevent its dispersion and to insure proper direction in the conduct of subsequent operations.

■ 992. In the *conduct* of partisan warfare the mobility, enterprise, and reliability of the troops employed are more important than their numerical strength. In general, the best results are obtained by the employment of numerous small detachments under capable and versatile subordinate leaders, all operating under the direction of an experienced superior commander.

An active counterreconnaissance defeats the enemy's reconnaissance detachments. His main body is harassed and held in suspense by repeated threats and raids. Whenever practicable, movements and attacks are made at night. During daylight hours, the main forces remain concealed, leaving only reconnaissance patrols in contact with the enemy.

By feint and demonstration, by changing methods of combat, and by spreading false information, the enemy is misled and conditions favoring surprise are created.

Use is made of obstacles to delay the enemy in front while attacking him in flank and rear. Raiding parties operating in the enemy's rear may seriously interrupt the enemy's system of supply by destroying bridges and attacking supply trains. Every effort is made to keep in communication with these raiding parties so that their subsequent activities may be properly directed.

Passive measures, operations at night, and dispersion counteract hostile air and mechanized operations.

■ 993. *Larger forces* engaged in the suppression of partisan warfare have superior organization, armament, and equipment but may be handicapped by lack of reliable information,

by dependence on an organized system of supply, and by difficulty in bringing the enemy to a decisive engagement.

■ 994. When the objective of the operations is the destruction of partisan forces or the quelling of tribal uprisings, vigorous and bold action by mobile forces is ordinarily the quickest and surest way of defeating the enemy bands. Usually, this can be accomplished best by an advance on a broad front along all available routes within the affected area against the enemy's principal villages and strongholds. These are then organized as defensive areas from which highly mobile columns conduct operations against any organized resistance located. Since the attacker is usually greatly superior in strength and means of combat, encirclement by double envelopment should be attempted in order to bring about a decisive result.

■ 995. When the objective of the operations is the occupation of the hostile territory, concerted action directed against the capital, the government, the main lines of communication, and main sources of supply is the quickest method of bringing about decisive battles and overthrowing the enemy.

Undue dispersion of force by using numerous minor detached forces may lead to defeat in detail.

Vigorous *air attacks* conducted in front and on the flanks of operations directed toward vital objectives prevent hostile concentrations that would slow up or divert the main forces. In addition to their material effects, air attacks weaken morale and the will to resist of both the armed forces and the civilian population.

CHAPTER 13

TROOPS TRANSPORTED BY AIR

GENERAL

■ 996. *Parachute troops* are troops moved by air transport and landed by means of parachutes. The principal tactical unit for parachute troops is the battalion. It consists of two or more combat companies and other units required by the mission and operation.

■ 997. *Weapons and equipment* of parachute troops include the rifle or carbine, automatic pistol, submachine gun, light machine gun, 60–mm mortar, and hand grenade, together with signal and demolition equipment. Parachute troops are armed and equipped for the execution of a specific task. Weapons and equipment not carried by the individual during the descent are dropped in containers on the landing area simultaneously with the parachutists.

■ 998. Ordinarily, parachute troops may be considered as the *advance guard element* of air landing troops or other military or naval forces. They constitute a powerful surprise factor and usually are employed in conjunction with air landing or mechanized troops in the path of the main ground effort, or close in rear of the enemy front line; otherwise they may be quickly surrounded and destroyed.

■ 999. *Air landing troops* are troops moved by powered aircraft who disembark after the aircraft reaches the ground. They are task forces organized as to personnel and equipment and trained for the execution of particular missions. They execute special missions in areas which are inaccessible, or not immediately accessible to other friendly troops. Their organization would include a headquarters, infantry, and essential units of other arms in suitable proportion. In each component the unity of tactical organization should be preserved as far as practicable. Parachute troops are attached to air landing troops for operations in hostile territory when it is necessary to seize, hold, and protect landing areas for air landing troops.

■ 1000. *Combined operations* of parachute and air landing troops are similar to the advance guard action of a large command; to the execution of a reconnaissance in force; or to a major raid against the enemy. Excluding the minor operations of parachute troops on sabotage and special missions, air landing operations are executed usually in conjunction with other ground or naval operations.

■ 1001. *Air superiority* in the locality of the operation is a fundamental requisite to successful air landing operations. Except when employed in small numbers and on missions requiring strict secrecy, air landing operations must be closely supported by combat aviation prior to, during, and after landing in hostile territory.

■ 1002. Except in extreme cases when used on sacrifice missions, troops transported by air should not be employed unless they can be supported quickly by other military or naval forces, or unless they can be withdrawn after their mission has been accomplished.

MISSIONS

■ 1003. Suitable missions for troops transported by air include:

a. Seizing and holding, or otherwise exploiting, important tactical localities or installations, in conjunction with or pending the arrival of other military or naval forces. Such missions include seizure and clearance of landing fields, beachheads, strong points, and ports; seizure of essential observation or other critical terrain; severing hostile lines of communication and supply; the destruction of bridges, locks, public utility enterprises, and other designated demolitions; seizure of river crossings, defiles, and other bottlenecks; blocking a hostile counterattack; interrupting the movements of hostile reserves; cooperating in the pursuit or breakthrough by ground forces by operating against enemy reserves and lines of communication, and blocking hostile avenues of retreat; and preventing the enemy from destroying essential installations, supplies, and matériel which might be of use in our own subsequent operations.

b. Executing an envelopment from the air in conjunction with an attack by ground forces.

c. Execution of surprise attacks as a diversion or feint in connection with other air landing or ground operations, or to create confusion and disorder among the hostile military and civilian personnel.

d. Execution of an attack against an isolated enemy position, impossible or impracticable of attack by ground forces.

■ 1004. The missions of parachute and air landing troops are facilitated under the following conditions: when the enemy air force is inferior or has been defeated; when landing in territory whose population may be expected to support the parachute troops with food, information, and transport; when landing in rear of a disorganized or defeated enemy; and when suitable terrain and good weather exist.

PLANNING OPERATIONS

■ 1005. In *planning* air landing operations, factors to be considered include the mission of the force; strength, disposition, and capabilities of the enemy to interfere with the operation; composition of own force; support to be furnished by combat aviation, and ground or naval forces; the effect of terrain; weather conditions; number, types, and capacities of transport planes available; time required for the movement; measures for coordinating the action of the combined forces engaged in the operation; movement of the command to the airdrome from which the operation is launched; troop and cargo loadings; sequence of deplanning; and supply and evacuation plan.

■ 1006. In planning the *organization* of a force for the execution of an assigned mission careful consideration must be given to the relative importance of the different arms. Certain missions require a relatively high percentage of infantry and artillery whereas other missions may require a preponderance of parachute troops, engineers and other special troops.

■ 1007. Excluding the use of parachute troops in small numbers for sabotage or special missions *any plan* for operations in hostile rear areas should provide for the following: local air superiority; close support by combat aviation en route, during, and after landing; the allotment of parachute troops in sufficient strength to assure the seizure of necessary landing areas and protection of the transport planes while landing;

an adequate infantry component. When facing a strong and unshaken enemy the landing must be quickly supported by advancing mechanized or other highly mobile ground units.

■ 1008. Plans must be based on accurate and detailed information. Every effort must be made to obtain detailed information of enemy activities in the combat area, including location, strength, armament, and capability of the hostile force to interfere with the operation; location of antiaircraft batteries and other defensive installations; composition and type of organized defenses of airdromes, landing fields, and other military or civil installations; morale of the civil population and its effectiveness as part of the defense force; location and type of obstacles used to obstruct possible landing areas; and the location of highly mobile hostile forces.

■ 1009. A comprehensive knowledge of the *terrain* is essential to the formulation of a detailed tactical plan for the operation. By studying maps and aerial photographs and by personal aerial reconnaissances of the combat area, landing and alternate landing sites are selected; towns, roads, and other key points definitely located; and the advantages and disadvantages of the terrain for the proposed operation carefully weighed.

■ 1010. The *weather* is an important factor in an air landing operation and must be studied carefully during the planning phase. Heavy fog, low clouds, and icing conditions have an adverse effect on flying. In addition, high winds interfere with accurate and safe landings of parachute troops. Therefore, a long range weather forecast should be studied and the operation scheduled, if practicable, so as to take advantage of favorable weather conditions.

■ 1011. The *tactical plan for parachute troops* should include provision for such matters as time of landing; support to be furnished by combat aviation; specific missions for the seizure and protection of the landing area including road blocking missions and control of local signal communications; antiaircraft and antitank defensive measure; seizure of transportation; contact with friendly espionage agencies; removal of obstacles from landing area; disposition of civilians; and plan for use of parachute troops when reinforced or relieved by air landing troops.

■ 1012. The *tactical plan for air landing troops* after landing in the hostile area should include provision for such matters as: time of landing; support to be furnished by combat aviation; missions for leading wave and subsequent waves; reinforcement of parachute troops; assembly positions; special signal communication instructions; location of command post; and similar matters. (For details of an air movement table, see FM 101–10.)

■ 1013. When an air landing force is operating in conjunction with ground forces and combat aviation, the air landing plan must be coordinated with the ground and air force plans. This coordination is best effected by personal conferences between commanders and staffs concerned. Each commander should have full knowledge of the general plan of operations; the forces involved; the missions of the ground force, the air force and the air landing force; objective of each force; time of attack and scheme of maneuver of ground forces; combat aviation support missions; signal communication arrangements between the forces; and other information necessary to assure coordinated action by the combined forces.

■ 1014. All preparations for an operation should be completed well in advance of the operation and, within the limits imposed by the necessity for secrecy, subordinate commanders should be given timely information of the details of the plan in order that units will have sufficient time to adjust equipment requirements, and complete special training.

As far as practicable, training and rehearsal for the operation should be conducted on terrain similar to that for which the actual operation is planned. *This includes joint training by the combined arms detailed to participate in the operation.*

■ 1015. The size and composition of the force assigned to a landing field is determined largely by the location and facilities of the field, the mission, the enemy situation, and the organization for combat. Each force is organized and equipped to execute a specific mission.

CONDUCT OF OPERATIONS

■ 1016. The *combined operations* of *parachute and air landing troops* are characterized primarily by the speed and sur-

prise with which these troops can execute an attack in hostile rear areas, or to intervene at critical areas in the theater of war.

■ 1017. It is not likely that higher commanders can exercise *direction or control* of air landing operations until after initial objectives have been seized or initial tasks executed. Each unit must be self-sustaining during the initial phase of combat. No support, except from combat aviation, can be expected before the landing of additional troops or until contact is made with other ground forces.

■ 1018. *The number of hostile landing areas* that are required for an air landing operation depends on the size and composition of the force, the mission, hostile defensive dispositions, and similar factors. Ordinarily, several landing fields are necessary for major operations. The use of several landing areas serves to deceive the enemy in that it causes him to disperse his defensive forces over a wide area, and conceals the place of landing of the bulk of the command.

■ 1019. Preliminary air attack directed against the prospective landing areas will ordinarily be required preceding the landing, to destroy or disorganize local defenses.

■ 1020. The time of starting *bombing missions* in support of an air landing operation depends largely on the mission of the force, the enemy air situation, defensive ground organization, and other factors which must be considered for each operation.

At an appropriate time preceding the launching of the air transport movement, bombardment aviation attacks enemy airdromes, planes on the ground, and other installations in the combat area. This is followed closely by bombing and machine-gun attacks against the local hostile defense force and against the defenses surrounding the landing areas to include hostile artillery within range of the landing area. During the landing, bombing operations seek to destroy enemy ground forces and defensive works, with particular attention to the attack of any motorized or mechanized units moving to the defense of the landing area. After the landing is effected, bombardment aviation furnishes close support for the ground operation in accordance with previously arranged plans or on call.

■ 1021. The *landing of parachute troops* should be timed to follow closely the bombardment operations against the defenses of the landing areas. Ordinarily, these troops are dropped around the perimeters of previously selected landing areas. Small fighting groups or units proceed to the execution of their initial tasks, which usually are the seizure and clearing of landing fields and the neutralization of local defenses. Other suitable missions for these troops include capture of important terrain features or buildings; road blocking; seizure of local signal communications; contact with friendly civilians and agents; covering the operations of other parachute troops; executing specified demolitions; and reconnaissance toward designated localities.

■ 1022. Air landing troops land shortly after the parachute troops in accordance with a time schedule coordinated with combat aviation and parachute troop operations or on a prearranged signal from the parachute troops on the ground. Thereafter, transport planes are landed on a time schedule which may be modified to conform to actual conditions on the ground.

Units operating from the several landing fields execute their assignments in accordance with a previously prepared plan, which should be flexible enough to allow commanders wide latitude in the conduct of the operation.

■ 1023. *Signal equipment* of parachute troops is limited to light and comparatively simple apparatus. Units down to and including the squad may be equipped with small, two-way radio sets, panels, and pyrotechnics. Signal equipment may also be procured or improvised locally.

Air landing troops modify their means and methods of signal communication to suit each local situation. On some missions long range radio sets and special pyrotechnic equipment may be required. Particular care should be taken to assure signal communication with supporting combat aviation by providing sufficient equipment for at least two different means.

COUNTERMEASURES

■ 1024. All unit commanders are responsible for the defense of their areas against parachute and air landing troops. Measures are taken to insure timely warning of the approach

of such troops by the establishment of air warning sentries or patrols and by cooperation with established military or civilian air warning services.

■ 1025. All troops stationed in an area cooperate in the defense against parachute and air landing troops by firing on descending parachutists and enemy aircraft within range. Hostile elements that land are attacked before they can effect a reorganization on the ground.

■ 1026. Troops engaged in tactical operations should be free of the responsibility of defending rear areas.

Special defense measures may be required. These include provision for the local defense of vital localities, a highly mobile reserve and an information and warning system carefully integrated with an adequate signal communication system.

■ 1027. *Local defense* involves dispersion; the detail of first-line troops for the purpose should be avoided. Troops capable of only limited service may be employed for the defense of industrial areas. Civilian law enforcement agencies, State guards, patriotic organizations, and industrial employees also may be trained in local defense.

■ 1028. The function of the *mobile reserve* is the attack and destruction of any enemy troops attempting or effecting a landing. The reserve should consist of thoroughly trained troops. It should be highly mobile. Speed is essential. It is desirable that its counterattack be delivered before the enemy has completely organized his forces after landing.

The composition of the reserve should be in accordance with its mission. The use of mechanized troops supported by light cannon is indicated both for mobility and because the enemy will necessarily be weak in these elements, unprotected by intrenchments and obstacles and vulnerable to their assault. Any additional troops should be motorized.

The position of the reserve is influenced by the location of the various areas it is to protect and the road net.

■ 1029. Thorough coordination is secured with the aircraft warning service and any other air defense measures organized in the area.

CHAPTER 14

AIR TASK FORCES

■ 1030. An *air task force* is a grouping of air, base, and service units formed to conduct the air missions required by a plan of operations.

The types of air missions required by the plan of operations determines the composition, strength, organization, and types of airplanes and other equipment of an air task force. Changes in the types of missions, or in the plan of operations, often dictate changes in the force, such as variations in the numbers and types of units composing it, and in the location of air bases. Organization must be flexible. There always should be available trained commanders and staffs in adequate numbers for all probable air task forces.

The air task force should contain the number and type of *reconnaissance, bombardment* and *pursuit,* air *transport* and *base* and *service units* essential for the successful accomplishment of the mission with which it is charged.

■ 1031. In general, airplanes of all combat types can be used within the limits of their range for reconnaissance, on missions against hostile air forces or vital elements of an enemy's national structure, for air attack of ground objectives, or in support of ground or naval operations. Pursuit aviation fights offensively in the air. Other combat aviation normally engages in air fighting only for its own protection in the execution of its primary missions.

Bombardment aviation is useful principally for air attack of surface objectives. Though pursuit aviation is useful primarily for air fighting, it can be used in emergency for air attack of such objectives as are vulnerable to light bombs, aircraft cannon, and machine guns. Pursuit is required to intercept and limit the operations of hostile bombers and other types of hostile aviation.

The size or surface of airdromes or landing fields may preclude the use of certain types of aircraft in the air task force.

■ 1032. In all air operations, the *weather* is of such importance that trained weather personnel must be with the force

to make accurate weather forecasts for the longest possible periods ahead. The time of initiating and conducting important operations is determined largely by these forecasts.

■ 1033. *Air superiority* in the area involved is prerequisite to continued, successful military operations. Greater numbers of airplanes, higher performance characteristics than corresponding hostile types, thorough training, high morale, intelligent employment and leadership, and superior base facilities tend to assure air superiority. Numerically inferior air forces possessing some of these factors may attain temporary or local air superiority.

■ 1034. To gain complete control of the air, hostile air forces must be destroyed, or neutralized by pinning them to the ground. The best method of accomplishing this result is air attack with bombs and aircraft gun fire against aircraft on the ground, air base facilities and installations, fuel reserves, bomb dumps and routes of communication; and against aircraft, engine, and equipment factories. Such attacks must be intensive, concentrated, and sustained. Detailed reconnaissance prior to and throughout the operations is essential. In many cases, protective measures by the enemy, such as concealment, dispersion, and antiaircraft defenses prevent complete neutralization, and hostile bombers will continue their operations. These must be opposed with pursuit aviation and with antiaircraft artillery.

■ 1035. An *air offensive* requires an estimate of the situation to determine the bombing objectives. These should contribute directly to the success of the military or naval operations as a whole. All bombing operations must be coordinated, both in time and in space, so that the full capabilities of the air task force are realized. Extensive and detailed preparatory reconnaissance is mandatory. Distance of the target from the base and the type of target determine the type of airplane required to perform the mission. When distances and loads to be carried are too great for available aviation of suitable type, preliminary operations must be undertaken to seize and prepare bases sufficiently close to the objectives.

■ 1036. There may be great temptation to disperse or dissipate combat aviation. It is the *responsibility of the commander* to whom air task forces are assigned or attached

to decide the relative importance of various lines of action and assure concentrated effort. Bombing attacks once begun must be continued to the complete and permanent destruction of the objective, or must be continued indefinitely at the rate necessary either to neutralize it or to realize the cumulative effect of air bombing. Otherwise, most of the value of any damage inflicted initially is sacrificed. In most situations, aviation units must be conserved in their employment, to insure their maximum effectiveness when most needed. During critical phases they should be thrown into action without hesitation or reservation, in the full strength required or available.

■ 1037. For the general doctrines applicable to combat aviation in *support of ground operations* see paragraphs 78 to 82, inclusive.

■ 1038. Effective close support of ground troops is not practicable until local air superiority has been established.

■ 1039. In *critical phases* of the ground battle, delivery of fire by combat aviation on the immediate front of the ground forces frequently is required. The added firepower and moral effect of combat aviation often are quickly decisive. In order to exploit their full mobility, fire support by combat aviation is ordinarily essential to the operations of mechanized forces. Supporting aviation can assist materially in the supply of, and communication with, fast moving ground forces.

■ 1040. Methods of operation and control must insure prompt and accurate designation of targets, effective use of signal communication, and mutual recognition by friendly units. Intensive preliminary reconnaissance is most desirable. Signal communication for target designation and mutual recognition normally is by panel from the ground, pyrotechnic signals, colored tracer ammunition, aircraft maneuvers, and radio. Wire communication from the supported force to the air unit command post is highly desirable, otherwise radio must be used. Liaison officers are necessary. The organic and attached observation airplanes of the supported unit can assist greatly in coordinating the air and ground actions during the operations.

■ 1041. Close supporting operations on the immediate front of the ground unit may require such intimate coordination,

and the time element in signal communication and staff action may be so short, that the air unit must be attached to the ground unit for operational control for definite limited periods.

■ 1042. Support of *troops transported by air* requires extremely close coordination and close control. Such operations require special air force support, including convoy by pursuit aviation, to prevent hostile air action against the expedition while in flight, and on the ground after landing. Preliminary air attack on the landing area and its vicinity may be required to destroy or disorganize local defenses. During the landing and subsequent ground operations, supporting air operations include the laying of a smoke screen and the attack of defending or counterattacking units, both ground and air. While in flight, control of the movement is a responsibility of the air commander.

CHAPTER 15

THE DIVISION

SECTION I

INFANTRY DIVISION

■ 1043. The infantry division is the basis of organization of the field forces. It is the basic large unit of which corps (except armored and cavalry) and armies are formed. It is the smallest unit that is composed of all the essential ground arms and services and which can conduct, by its own means, operations of general importance. It can strike or penetrate effectively, maneuver readily, and absorb reinforcing units easily. It can act alone or as part of a higher unit.

The combat value of the infantry division derives from its ability to combine the action of the various arms and services to maintain combat over a considerable period of time. In active operations the division should be reinforced with air observation means.

When operating alone, additional aviation, engineer, antitank and supply means will normally be required by the division.

■ 1044. There are two types of infantry divisions in the United States Army, which for convenience are designated as the "square" and the "triangular" division. The square division retains the brigade organization for infantry and artillery components, each infantry brigade consisting of two infantry regiments, the artillery brigade of three regiments. In the triangular division, on the other hand, there is no brigade organization. Three infantry regiments and four field artillery battalions comprise the major combat elements.

All organic transportation of the square and the triangular infantry divisions is motorized. Neither of these divisions is provided, however, with sufficient transportation to move all its elements simultaneously.

The triangular division organization eliminates the brigade echelon in the chain of command with a corresponding acceleration of order transmission. The field artillery bat-

talions operate directly under the orders of the division artillery officer representing the division commander.

■ 1045. The doctrines of operations and combat by ground, nonmechanized forces discussed in earlier chapters of this manual are applicable to the infantry division.

■ 1046. When a division is operating as part of a higher unit, restrictions on the freedom of action of the division commander are often necessarily imposed by the higher commander. In an advance the corps commander will ordinarily prescribe a zone of advance for each division of the corps. The road net within the zone may largely influence the march formations and supply arrangements within the division. The corps may also prescribe the general line which advance guards of the divisions will cross at a given time at the beginning of the march, the extent of the march, as well as any special formation of the corps for the advance.

Further coordination may be obtained by designating lines which the various divisions must clear by specified times and by designating rear boundaries for divisions at the completion of each stage of the march.

■ 1047. The army or corps has reconnaissance elements which operate in advance of the divisions. While cooperation and contact between these reconnaissance elements and those of the division are necessary, their presence in no way relieves the division commander of responsibility for reconnaissance by, and security for, his own command.

■ 1048. In combat the mission assigned the division may require the division to act in close coordination and cooperation with adjacent divisions or to operate at a distance from the main force. The decisions and actions of the division commander in either situation are predicated upon the greatest assistance to the successful execution of the task of the higher commander.

■ 1049. In all operations the personal reconnaissance of the division commander is of the highest importance. He makes use of all available means of transportation to reach vantage points from which he can gain direct information and exert his influence most effectively and expeditiously on the operations. He must be provided with alternate means of signal communication so that his orders can be speedily transmitted.

SECTION II

MOTORIZED DIVISION

■ 1050. The *motorized division* is a triangular infantry division which has sufficient additional organic motor transportation to permit the *simultaneous* movement of all its elements.

■ 1051. The motorized division is a specially equipped, highly mobile unit intended primarily for employment by higher commanders. It has greater capability than the normal infantry division for rapid movement under suitable conditions but, when dismounted, maneuvers and fights in the same manner as the normal division. The characteristics of the motorized division make it especially suited to execute the following types of operations:

To provide close support of armored or tank units; to consolidate and hold gains made; to protect the flanks and rear of armored or tank units and permit their continued advance; to relieve armored units when terrain renders their operations unremunerative; and to protect armored or tank elements when withdrawn or halted periodically to refuel or to reorganize.

To seize and hold important localities pending arrival of less mobile forces.

To exploit success achieved by armored, tank, parachute, and other units.

To execute envelopments and turning movements either in close cooperation with armored and other mobile units or, under favorable conditions, independently against hostile flanks and rear or strategic localities.

To constitute a powerful mobile general reserve for use either offensively or defensively as the situation demands.

■ 1052. Except in emergency situations, motorized divisions should be employed on missions which permit initially the utilization of their inherent mobility, primarily in support of, or in cooperation with, other mobile forces. When an independent or semi-independent mission is contemplated for a motorized division, provisions should be made for reinforcing it with reconnaissance and security means, tanks, additional motorized engineers, artillery, or other necessary units.

March procedure must insure proper control and direc-

tion, both day and night, by means of vehicular radio, periodic reports, control posts, guides, direction signs, and other expedients. Additional control and coordination of reconnaissance, security, and combat teams may be assured by designation of phase lines.

Maximum exploitation of the mobility of the motorized division by day will be contingent upon control of the air for the area of movement by motor. At all times, dispositions must be made with due consideration of hostile air observation and attack. An adequate observation and warning system must be in operation continuously and include both ground and air elements. Vehicular antiaircraft weapons must be manned and alert for prompt action at all times during movement and at halts. Maximum use of cover, concealment, and camouflage must be habitual. Distances between columns and vehicles in column are increased, but with due regard for the greater time length of the columns and its effect on the tactical employment of the division.

Close cooperation and coordination of reconnaissance and security agencies of all echelons are essential to assure rapid, uninterrupted, and secure movement of motorized units.

Reconnaissance and security groups obtain and transmit timely information of terrain, routes, and enemy dispositions so as to prevent delay or countermarching of other elements. Engineer reconnaissance agents should accompany divisional ground reconnaissance groups.

■ 1053. The motorized division operates normally as two or more closely coordinated combat teams which may advance by separate routes or zones previously examined by reconnaissance agencies. When the situation calls for a strong attack, the division is assembled for concerted action by appropriate maneuver, so as to develop its full power.

Operations must be conducted with the maximum speed consistent with conditions of terrain, roads, and the tactical situation. For this reason engineers must march well forward in order to insure expeditious advance in difficult areas and negotiation of difficult points. Similarly, commanders must habitually move near the head of respective groups. Decisions must be timely. Orders must be brief, normally oral and fragmentary, and transmitted by the most rapid means available—radio, visual signals, staff officer, or vehicular messenger.

While speed and boldness must characterize the operations of motorized divisions, development for combat must be with a proper appreciation of vulnerability to hostile combat aviation, artillery, and mechanized units. In the approach march, motors move across country when practicable with security provided by reconnaissance vehicles. Assembly areas or detrucking points should provide maximum security and cover for personnel and vehicles, and be reasonably secure against effective hostile artillery fire. Parks for personnel carriers must be properly concealed and camouflaged. Park locations should facilitate protection without necessity for detachment of combat elements for that purpose. Anticipatory measures for further movement of vehicles from assembly areas or parks must be habitual to include liaison agents and communication with combat elements, reconnaissance of forward and rear routes, and preparation of routes by engineers.

Motorized divisions which are supporting armored units must provide close support and prompt relief in order to facilitate the continued rapid advance of the armored troops.

In situations where further operation of the motorized division is unprofitable, it should be relieved promptly by less mobile troops and released for use where its mobility can be utilized.

In exploiting a break-through, motorized divisions may be used in support of, or in conjunction with, armored divisions.

■ 1054. The mobility of the motorized division provides higher commanders a powerful, flexible means to meet crises in defensive situations and to launch surprise counterblows.

The special characteristics of a motorized division make it especially suitable for execution of delaying missions, except against armored units.

In order to capitalize the mobility of the motorized division, close control of and coordination of combat teams should be emphasized. This involves both communication means and technique and proper use of liaison agents within the division and with other units.

SECTION III

CAVALRY DIVISION

■ 1055. The *cavalry division* is a tactical and administrative unit consisting of a division headquarters and headquarters

troop, two brigades, mechanized reconnaissance, antitank, artillery, engineer, signal communication and service elements. Scout cars, primarily for distant ground reconnaissance, motor trucks for supply, and motorized elements for command and signal communication purposes are all organically assigned. Specially equipped trucks are organically contained in the division to transport a limited number of horses, men and equipment. Its organization is such, however, that it can continue to operate effectively without the motor elements.

The cavalry division may be assigned independent missions which require operations far from other troops. It may constitute part of a cavalry corps; it may be assigned or attached to a corps, an army, or group of armies, or it may be held in general headquarters reserve.

■ 1056. Cavalry is most effectively employed in those areas where the terrain is definitely unfavorable to the operation of mechanized units or in areas known to be free of hostile mechanized forces. If employed in areas where hostile mechanized forces are likely to be encountered, the cavalry division should be strongly reinforced by mechanized and antimechanized means.

■ 1057. The *primary mission* of Cavalry is combat. The mobility of the cavalry divison permits it to extend the scope of operation of less mobile ground troops and secure freedom of action for them. In a war of movement, cavalry is employed initially for surprise thrusts into enemy territory, for reconnaissance, and for screening and covering other forces. Thereafter, its most effective employment is in large groups for swift and decisive action. Its main strength must not be dissipated through indiscriminate detachments, nor sacrificed through prolonged performance of missions which can be performed more satisfactorily by other arms.

■ 1058. Cavalry ordinarily executes *reconnaissance* in cooperation with aviation. Aviation locates the enemy at a distance and orients the ground reconnaissance elements, thereby conserving their energy and speeding up their execution of reconnaissance.

■ 1059. The cavalry division executes *reconnaissance* for larger units in accordance with instructions from the higher

commander. These instructions include all pertinent information about the enemy and friendly troops, the missions of the larger units, the intentions of the higher commander, the mission of the cavalry division expressed in terms of the information required, the area to be reconnoitered and the cooperation and coordination between the cavalry division, reconnaissance aviation, and other reconnaissance agencies.

The higher commander assigns to the cavalry division a zone of reconnaissance which ordinarily does not exceed 25 to 30 miles in width. The cavalry division commander redistributes this zone to reconnaissance detachments varying in strength and composition according to the enemy opposition expected and the relative importance of their missions.

In distributing forces for reconnaissance and in assigning missions, the division commander estimates the relative importance of factors affecting the mission of the division and assigns greater strength and a more aggressive mission to detachments operating in decisive zones.

The cavalry division commander indicates the general axes or zones for reconnaissance detachments within the division zone of action and the lines to be reached at designated times by elements of the detachment. The distance between the reconnaissance detachments and the main body of the division varies with the situation; at times it may become several days' march. Reconnaissance detachments are not responsible for the immediate security of the division. This must be provided by the detail of the necessary covering forces.

When reconnaissance detachments are operating at considerable distance from the division, or when secrecy considerations necessitate radio silence, the establishment of advance message centers will facilitate the forwarding of information and reduce the burden on the reconnaissance elements. Under such circumstances, the protection of the advance or relay stations devolves upon the division commander.

When the distance between the main opposing forces is so reduced that the mobility of the cavalry cannot be utilized, the division should be rapidly shifted and, depending upon the situation, directed against the enemy flanks or rear, disposed to protect a flank, or placed in reserve.

■ 1060. A cavalry division protects the disposition and action of other ground forces by *counterreconnaissance* or

screening, which may be conducted either offensively or defensively. In executing a counterreconnaissance mission the division seeks to defeat or neutralize enemy ground reconnaissance forces.

In the performance of counterreconnaissance the cavalry division ascertains at the earliest practicable time the location and activity of the enemy cavalry or other major ground forces whose operations may jeopardize the main forces.

A screening mission is most effectively accomplished by the early defeat of the enemy ground reconnaissance forces. The dispositions of the division in offensive counterreconnaissance are similar to those prescribed for reconnaissance. Reconnaissance detachments operate aggressively and locate the main enemy forces to obtain information for the division upon which it can base further operations. In defensive counterreconnaissance, which is most effective when established along a continuous obstacle, patrols are pushed to the front; and the division commander disposes his forces so as to block the main routes of approach.

When screening the concentration of large forces, cavalry divisions usually act defensively. The screen utilizes available obstacles to the maximum and is established at a sufficient distance to the front to keep enemy ground reconnaissance agencies from observing the location and disposition of the forces being concentrated.

■ 1061. Large bodies of horse cavalry usually *maneuver* mounted and fight dismounted. Cavalry uses the mobility of its horses to gain the advantage of surprise against the hostile flanks and rear from which dismounted fire attacks can be employed effectively and decisively.

Terrain may be the controlling factor. Where concealment exists for a dismounted advance, losses are minimized. Conversely, where there is no concealment or cover, a quick mounted dash from a concealed line of departure often results in fewer losses.

Long mounted advances against troops in position, and mounted attacks against prepared positions, or against troops in position and able to employ their combat power effectively, should not be made.

■ 1062. The dispositions of the cavalry division for *attack* usually include a pivot of maneuver about which the com-

mand operates, a maneuvering mass charged with the main attack, and a reserve.

As soon as contact is foreseen, the division endeavors to secure points of observation and to deny them to the enemy.

In a meeting engagement, the advance guard establishes the pivot of maneuver. In a more deliberately prepared attack, a special force may be detailed to establish it. The pivot of maneuver engages the enemy's attention and pins him to his position by a fire attack or by a combination of fire attack and maneuver.

The maneuvering mass contains the main offensive power and often constitutes the greater part of the division. The division commander assigns to the leader of this fraction the accomplishment of the vital offensive action and allows him sufficient liberty of action to take full advantage of the developments of the situation. He informs him of the general plan, the mission of the maneuvering mass, and the duties of the other elements of the division. He usually specifies the general location, and the route thereto, from which the attack of the maneuvering mass is to be launched.

■ 1063. The *reserve* is kept mounted or close to its horses. Its initial location depends upon its contemplated employment. The division commander uses the reserve promptly to strike at a weak area in the hostile dispositions, to push through a success gained either by the pivot or the maneuvering force, or to pursue a defeated enemy. Should the attack fail, the reserve may be employed to cover the reorganization, to assist in holding the position gained, or in occupying a rear position when a withdrawal follows.

■ 1064. When a cavalry division is to be employed in the *exploitation* of a break-through, it is moved to the vicinity of the main effort of the attack which is expected to break through the enemy's defenses. The breach should be sufficiently wide to enable the cavalry division to pass through without receiving severe fire from the flanks. The mission assigned the division on clearing the breach is clear-cut, aggressive, and should be relentlessly carried out.

■ 1065. When the cavalry division constitutes an encircling force *in pursuit*, it seeks to block the enemy retreat, especially at defiles and other critical areas; it delivers attacks against

the enemy flanks, and carries out destruction on his lines of retreat.

■ 1066. When the cavalry division is acting alone, it seeks to destroy the hostile retreating force by direct pressure and encircling pursuit. (See ch. 9.)

■ 1067. Cavalry divisions may be employed on the *defensive* to seize and hold a position pending the arrival of other forces, to cover a withdrawal, to delay the enemy's advance, or to fill a gap in the line of battle.

■ 1068. Within the scope of its powers and limitations, cavalry operates, in defensive combat, the same as infantry.

Due to organization and characteristics, cavalry units usually occupy comparatively broader fronts with less depth than do corresponding infantry units.

In defensive combat the position or area to be defended is prepared for defense and occupied by a small proportion of the available cavalry force consisting principally of horse elements, while the bulk of the command including the mechanized elements, by maneuver and threat, or actual attack, endeavors to block or divert the enemy at a distance. Even when it is necessary for cavalry to defend a particular area or position, its best chance of success lies in initial dispositions in advance of the final defense area. In this manner, inherent mobility will be used to best advantage. Against an enemy strong in cavalry, the division reserve should be large.

■ 1069. In executing *missions of delay* the cavalry division employs defensive tactics, offensive tactics, or a combination of the two, consisting of frontal delay and flank attack.

It avoids decisive combat.

Every effort is made to surprise the enemy by the choice of delaying positions and by the forms of action used.

The maximum amount of time is gained by forcing the enemy to reconnoiter, maneuver, and deploy.

The delaying force checks the enemy by bold and aggressive action, mounted and dismounted.

It usually withdraws before suffering serious loss unless its missions require more determined resistance.

Surprise attacks delivered over previously reconnoitered ground on the heads of hostile columns as they emerge from defiles, woods, or villages, have excellent chance of success.

SECTION IV

ARMORED DIVISION

ORGANIZATION

■ 1070. The *armored division* is the basic large armored unit of the combined arms. It comprises troops of the essential arms and services so organized and equipped as to make it tactically and administratively a self-contained unit, capable to a considerable extent of independent action.

■ 1071. The armored division is a powerfully armed and armored, highly mobile force. Its outstanding characteristics are its battlefield mobility and its protected fire power. Other important characteristics are: extended radius of action; shock power; logistical self-containment; and great sensitiveness to obstacles, unfavorable terrain, darkness and weather.

■ 1072. The armored division is organized primarily to perform missions that require great mobility and firepower. It is given decisive missions. It is capable of engaging in all forms of combat, but its *primary role is in offensive operations* against *hostile rear areas.*

■ 1073. Two or more armored divisions may be organized into an armored corps. (See FM 100–15.)

■ 1074. The armored division consists fundamentally of five echelons: *command, reconnaissance, striking, support,* and *service.* The component arms and services are organized, equipped and trained to operate within the division framework in accordance with their tactical role. When operating separately or as part of an armored corps, the division is reinforced by the attachment of such additional arms and services and by the support of such aviation as the mission and situation demand.

■ 1075. The *command echelon* is organized and equipped for great speed in the conduct of operations. Plans must be simple and flexible. Rapidly changing situations require advance planning, preparation of terrain studies, and *close contact* with developments in forward areas in order to make changes in the initial plan and expedite the announcement of subsequent decisions and orders. Maximum use is made of

standing operating procedure, air liaison, and special prearranged signals.

■ 1076. The *reconnaissance echelon* performs ground reconnaissance for the armored division. If necessary, it fights for information. It works in close cooperation with observation aviation, troops transported by air, and supporting ground units. Its reconnaissance is characterized by fast, bold, aggressive action and by prompt transmission of information procured. Success of armored operations depends largely on prompt and aggressive exploitation of the results of reconnaissance. In many situations, the reconnaissance echelon seizes terrain objectives in advance of the division pending the arrival of other elements. Under certain conditions it executes delaying missions. During combat it may be assigned reconnaissance or security missions or may be held initially in division reserve to meet emergencies.

■ 1077. The *striking echelon* is the main attack force of the armored division. It consists of tank regiments reinforced as the situation requires by other elements organic to the division. Reconnaissance and heavy weapons elements are included in the tank organizations.

■ 1078. The *support echelon* consists of infantry carried in armored vehicles. It is reinforced by artillery and other organic elements of the division in accordance with the mission and tactical situation. Its basic role is to support closely the striking echelon by offensive or defensive action.

■ 1079. The *service echelon* assures prompt supply, evacuation, maintenance, and administration of the division. (See FM 100–10.)

■ 1080. The *artillery* components are organized and equipped to render immediate, controlled fire support to the various elements of the division. Timely support is facilitated by the organization and equipment of armored artillery and the transmission of information by radio.

Once the attack is in progress, the speed of the striking force may make its support by artillery impracticable. Combat aviation must take over and execute the missions assigned to artillery in more slowly moving operations.

■ 1081. *Engineer units* facilitate the movement of the armored division by removing, or assisting in the passage of, obstacles and mine fields; by strengthening bridges; and by constructing, repairing, and maintaining crossings. Demolitions and natural and artificial obstacles are used to hinder or canalize movements of hostile forces. Engineers engage in combat when necessary for the accomplishment of their assigned work.

■ 1082. The *signal troops* of the armored division are organized for the rapid establishment and maintenance of signal communication. Because of its speed, radio is the principal means used, but all practicable means are provided. Effective signal communication between armored units and supporting artillery and combat aviation is vital in armored operations.

■ 1083. *Combat aviation* is employed against hostile aviation to prevent air observation and attack of the division. During battle it is used for direct support of operations. Its missions include attacks on hostile command and supply installations; attacks on hostile reserves and formed bodies of troops, particularly hostile armored units; attacks on hostile antitank weapons, artillery, and other ground weapons; attacks on targets of opportunity and critical points in the enemy position and the maintenance of air superiority in the decisive areas.

■ 1084. *Observation aviation* performs command, reconnaissance, observation, liaison, and signal communication missions and cooperates closely with the division reconnaissance echelon. Air observation of artillery fire is necessary if fire is to be delivered on targets which cannot be observed from the ground. Observation aviation maintains effective liaison and coordination between the tanks, artillery and combat aviation.

■ 1085. *Troops transported by air* may be employed in conjunction with the operations of the armored division to land in advance of it, to secure terrain objectives on the routes of march or to seize vital points in rear of the hostile front.

■ 1086. Attached *antiaircraft units*, equipped with weapons suitable for both air defense and antitank employment, pro-

vide protection of areas and installations vital to the operations.

■ 1087. Attached *chemical units* are charged with the planning, execution, and supervision of chemical operations. They are employed to supplement organic means of the division in the execution of smoke missions during operations.

RECONNAISSANCE

■ 1088. Speed of movement of the division and of the enemy requires air and ground reconnaissance forces to operate at great distances from the main body. The distance at which air reconnaissance operates is never less than the operating range of hostile armored forces. These distances at which the division reconnaissance battalions operate are influenced by the imminence of contact with hostile ground forces and the characteristics of these forces. Reconnaissance agencies of lower units search the area intervening between the division reconnaissance battalion and the main body. When the threat of hostile air attack is present, air reconnaissance includes the known location of the threat and is extended to such distance as will afford the division and supporting pursuit aviation ample warning of an air attack.

When necessary, the air reconnaissance effort is supported by combat aviation; ground reconnaissance units of the division are given such additional support from other elements of the division as the situation and mission demand.

■ 1089. In conjunction with the execution of specific missions, all reconnaissance elements report information of terrain, roads, signal communication facilities, landing fields and supplies observed. Ground reconnaissance elements should include engineer personnel whose mission is to determine the condition of roads and bridges and furnish timely information of any repairs or construction required. Negative reports must be submitted with the same promptness as is positive information.

SECURITY

■ 1090. Security depends largely on the efficacy of concealment, of supporting combat aviation and antiaircraft artillery, and of ground security detachments in preventing discovery in bivouac and during movement.

Timely warning from far reaching, aggressive, air and ground reconnaissance is vital to protection against surprise. Natural barriers, with their crossings or passes destroyed or blocked, and defended, provide a high degree of ground protection with economy of force for both the division and its lines of communication. Camouflage, dispersion, concealment, and high speed in movement, combined with the aggressive employment of combat aviation and antiaircraft weapons, afford the best security against air attack.

■ 1091. Precautions and protection against attack, principally against air attack, are stressed during periods of refueling and maintenance. Congestion must be avoided. Maximum use is made of concealment and cover.

■ 1092. In cooperation with large forces, security may be provided initially by other troops so that the armored operations may come as a complete surprise to the enemy. During subsequent operations, the superior commander may prescribe security measures to be performed by other troops for the protection of the combat elements of the division, the mobile supply base, and the lines of communication. In all situations, columns or groupings of the division are responsible for their own local security.

■ 1093. Bridges over unfordable streams, passes through mountains, and other defiles are seized in advance of the main body and protected against both ground and air attack. Existing natural barriers paralleling the direction of advance are used to establish protected corridors for security of the division and its lines of communication.

■ 1094. Usually *security detachments* for daylight movements are composed of tank units reinforced by other arms. During night movements, during extended periods of tank maintenance and refueling, or when terrain is occupied for protection, infantry and machine guns are the principal component. Security detachments for the movement are smaller and operate at greater distances between elements than for cavalry or foot divisions.

■ 1095. During movement, *frontal security* is normally performed by column advance guards.

In proximity to hostile armored forces, column advance guards are stronger and operate at a greater distance from the main body than when opposed by other hostile forces. Zones of responsibility are assigned by division to column commanders.

■ 1096. During movement, *flank security* is provided where practicable by utilizing natural and artificial obstacles, protected by detachments and by flank guards detailed by column commanders.

■ 1097. During long halts, and in bivouac, the division secures itself principally by far reaching reconnaissance, by skillful use of terrain and natural and artificial barriers, by depth of disposition in the halt area, by an outpost and by local security measures. In proximity to the enemy or behind the enemy lines, all around security is provided. Infantry, with artillery, antitank and engineer units, constitutes the principal element of the outpost.

■ 1098. The area selected for a halt to assemble, reorganize, rest, or refuel should permit rapid communication with reconnaissance elements, and should provide natural terrain barriers to hostile attack, particularly in the presence of hostile armored units. The halt area may be utilized as a base for the continuance of operations.

■ 1099. Based on information received from its reconnaissance and security agents, the armored division dispatches troops and combat aviation, if available, to destroy a known, potential hostile threat before that threat can become a real danger to the division.

MARCHES

■ 1100. The armored division normally marches in multiple columns to facilitate readiness for action and protection against hostile air and armored force attack. In the presence of hostile aviation, secrecy, surprise and protection are favored by night marches. When tactical considerations govern, march columns are constituted in accordance with the probable employment of the striking and support echelons in combat. Mobility is exploited to achieve surprise.

■ 1101. The tank elements usually lead when the column contains both tank and infantry units. However, during hours

of darkness, when the situation is obscure, when the plan of maneuver contemplates the commitment of the infantry prior to the tanks, and when the employment of the tanks cannot be reasonably foreseen, infantry is placed in the lead.

OFFENSIVE OPERATIONS

■ 1102. Tactical operations of the armored division are characterized by bold maneuvers executed at high speed to create a preponderance of power in the decisive area. Combat action is further characterized by the maximum coordination possible initially, followed by decentralization of means and reliance upon the initiative of subordinates.

Operations are predicated upon deliberate, detailed planning and rapid, aggressive execution. Completeness of plans is limited only by the time available.

The timely personal influence of the commander must be exerted in all operations. He must have at his disposal various means of rapid transportation and signal communication to enable him to exert this influence.

■ 1103. All armored force attacks contemplate the rapid transfer of shock power and protected fire power into the vital part of the hostile rear area from an unexpected direction. The attack is launched in mass in a decisive direction with such speed and violence that the enemy is afforded no time or opportunity to organize and coordinate his reaction before the armored attack mission is accomplished. Such attacks produce early, hostile demoralization and decisive results.

■ 1104. The mobility of the armored division permits great latitude in the choice of direction and method of attack. Whether the attack will be executed as a turning movement, envelopment, or penetration, will be largely determined by the hostile dispositions and organization of the ground, the terrain, the time factor, and lines of communication within the hostile area.

■ 1105. Four conditions should be present or be created for successful offensive action: air superiority, surprise, favorable terrain, and the absence or neutralization of massed enemy defensive means.

■ 1106. In order to obtain surprise, all preparatory movements are carefully concealed and measures are taken to prevent hostile ground and air observation of the division. The mobility of the armored division is exploited to keep the enemy in doubt as long as possible as to the area of its employment. Radio often is silenced prior to the attack. After the attack is launched the element of surprise may be retained by sustained speed and power.

■ 1107. Areas favorable for attack are determined from the information obtained by map study, from reconnaissance agencies, from higher and adjacent units, and from troops already in contact with the enemy.

Armored units can be employed on comparatively rough terrain. Localities with heavy timber, high boulders and stumps, steep slopes, marshes, deep or muddy bottom streams, and streams with abrupt banks are, however, obstacles to armored vehicle operations. Defended towns or cities are avoided.

■ 1108. Ground antitank measures include natural and artificial obstacles, demolitions, strongly organized localities, mine fields, antitank weapons, artillery and armored units. The attack is planned so as to neutralize, blind or overcome the hostile antitank defenses in the zone of attack and to strike at defensive weakness.

■ 1109. In attack the combat elements of the armored division generally are disposed into three parts: a striking force (striking echelon), a supporting force (support echelon), and a reserve.

■ 1110. When the initial terrain is unfavorable for tank operations or when hostile antitank defenses are strong, the support echelon of the armored division may attack in advance of the striking force to secure ground favorable for the initiation of the tank attack. If operating in close cooperation with other troops, the entire armored division may be held out until the difficult zone has been taken by other troops or has been disrupted by artillery and air attack.

When conditions permit the striking echelon to lead the attack the support echelon follows the striking force to occupy and hold objectives seized by the striking force.

■ 1111. Reserves are employed to protect the flanks of the attack and to maintain its continuity and direction.

■ 1112. Except when the attack is launched by passing through foot troops already in position, the division as a whole usually assumes attack formations directly from march columns. Ordinarily, a short halt is necessary for subordinate units to designate objectives on the ground.

■ 1113. Zones of action and a line of departure often are prescribed for coordination. Attacking tank units are disposed in approach march formation when they cross the line of departure. As soon as resistance is encountered by covering detachments, the leading tank waves assume attack formations.

■ 1114. Prominent terrain features may be designated as phase lines to coordinate the effort of all troops, including supporting combat aviation.

■ 1115. The depth and frontage of the initial combat formation depend primarily upon known hostile dispositions and characteristics, the terrain, and distance to the objective.

The attack of the striking force must be organized and launched with sufficient depth to insure sustained striking power. It is delivered on the minimum frontage necessary to overcome resistance to its advance.

■ 1116. The attack is rapid, deep and sustained until the decision is won. It is characterized by the employment of the striking echelon in mass in a series of waves, by rapid concentrations of artillery, heavy machine-gun and combat-aviation fire on critical objectives, and by proper timing in the engagement of reserves.

■ 1117. Each subordinate tank unit in the attack is assigned a direction and one principal objective. Suitable objectives are those hostile elements or installations, the destruction of which will disrupt most effectively the enemy operation.

■ 1118. The situation, hostile dispositions and characteristics, the number of objectives which can be assigned definitely to major tank units, the direction of advance to the assigned objectives, and the terrain may admit an attack in column of waves or they may require echelonment of the waves on one or both flanks.

In an obscure situation the main attack is launched in a deep column of deployed tank units. This formation is flexible, is easy to control during later deployment, and makes available the means with which to meet unforeseen contingencies.

■ 1119. The infantry element of the support echelon is transported in armored personnel carriers. It remains mobile as long as the situation permits. When assigned the mission of following the striking echelon, it follows closely; prepared to overcome the remaining hostile resistance in the areas over which the tanks have passed, to occupy and hold the ground gained, or to cover the reorganization of tank units during the course of the attack. Prior to the attack by the striking echelon, it may be used to develop the enemy situation with a secondary attack supported by artillery, combat aviation, engineers, and, when necessary, by some of the tanks.

■ 1120. The attack of the armored division requires careful coordination of the supporting fires of the artillery, heavy infantry weapons, including mortars, and combat aviation to prevent concentration of hostile mobile antitank weapons in the zone chosen for the offensive, and to neutralize enemy weapons dangerous to the attack.

At times preparatory fires may be omitted in order to attain surprise.

■ 1121. The artillery covers the development of the division. It may be employed to neutralize hostile rear defenses until the engagement of the tanks or to concentrate on areas secure from tank attack. In support of the division attack the artillery fires are directed to the neutralization of the antitank defense and artillery which constitute the greatest threat to the advance. Frequently small artillery units are pushed forward, prior to the attack, in order to deliver direct fire on targets of opportunity. Prearranged signals and messages are used to facilitate cooperation between the tanks and supporting weapons.

■ 1122. In a meeting engagement with unarmored troops the attack is pushed to conclusion without delay. The attack is launched promptly and aggressively in order to afford the enemy no time to develop and concentrate his defensive means. Tank attacks on a broad front against a flank will

engage a greater number of enemy troops simultaneously and permit a maximum use of shock and fire power. If flank attacks are not practicable, frontal attacks with deployment on a narrow front in great depth are made from march columns.

■ 1123. In a meeting engagement with hostile armored units the advance guard, supported by artillery and combat aviation, attacks to limit hostile maneuver to the front and to deceive the enemy regarding the direction, time and strength of the main blow. The situation may favor the main blow as a follow through of the advance guard action. Otherwise, the division seeks to launch its striking force against the flanks and rear of the hostile force to surround and destroy it.

Supporting combat aviation attacks hostile tanks, artillery, antitank weapons, reserves, and reinforcing troops.

■ 1124. In an enveloping attack by the division acting alone, against an enemy in position, the support echelon may attack to fix the enemy front while the striking echelon makes the main attack. In cooperation with other large unarmored units, the entire armored division is employed to make or lead the enveloping attack while other units hold the enemy in position.

When the direction of the envelopment has been determined, the striking echelon preceded by its reconnaissance units and covering detachments, develops and maneuvers rapidly to launch its attack. Elements of the support echelon not required for the secondary attack, follow the striking echelon closely.

■ 1125. The armored division penetrates an enemy position on a narrow front and then extends to attack the enemy rear in order to destroy his defense and exploit the success.

■ 1126. In penetrations of organized positions in cooperation with other large units of the combined arms, the zone of the initial break-through may be neutralized or breached by other troops. The armored division is then employed to continue the attack and complete and exploit the hostile disruption. It is followed immediately by other highly mobile units to extend, widen, or hold the breach. Motorized divisions are especially suitable for this purpose.

■ 1127. Delay in launching the armored division through a neutralized zone or a breach affords the enemy time in which to organize and coordinate countermeasures and may result in a serious reverse.

The shoulders of the gap must be held securely, either by troops of the support echelon or by other troops. The passage of the armored division through the breach must be effectively protected against antitank gun fire and hostile air and ground reaction. Once the breach has been effected, the enemy must not be permitted to close it. Flank attacks continue to widen the breach.

Hostile counterattacks against the flanks of the penetration are met by combat aviation, by reserves, and by the fire of artillery, antiaircraft artillery and antitank weapons.

■ 1128. When forward progress of attacking units is stopped by hostile resistance, fire of artillery and combat aviation is concentrated on the resistance, and flanking movements are initiated at once.

Elements of the support echelon, reinforced by combat aviation, artillery, and engineers, may be employed to advance the attack beyond terrain obstacles or ground unfavorable for tank action.

■ 1129. Some reorganization of assault units is often necessary after each tank objective is overrun. The leading waves may be passed through by other tank units. Every effort must be made to maintain the continuity and speed of the attack.

■ 1130. If the tank attack is unsuccessful initially, the advance elements of the support echelon strong in machine guns and antitank guns immediately establish a position behind which the tanks withdraw and reorganize for further effort. The supporting artillery and combat aviation protect the reorganization.

■ 1131. When the armored division has passed through the hostile organized resistance, its ground reconnaissance elements are dispatched at once toward the objective. These elements, working in close cooperation with the air reconnaissance, report hostile reserves and artillery, hostile command and supply installations, and unfavorable terrain. Appropriate targets are attacked.

■ 1132. The division must provide flank protection. Flank protection is aided by the speed of the advance, the utilization of natural barriers on the flank and by the support of combat aviation.

■ 1133. When the striking echelon captures its objective, the necessary reorganization is initiated at once under the protection of the support echelon, artillery and combat aviation.

Reorganization and consolidation of the objective are limited to the essentials. An advance to a second objective or exploitation of the success is begun without delay. Exploitation often will be executed in close cooperation with other highly mobile troops which have been moved close behind the armored division in its attack.

Extended exploitation may be initiated immediately after passage of the hostile organized resistance without waiting for reorganization or consolidation of the objective. This is particularly true in attacks against inferior hostile troops and against troops weak in aviation and mechanized units.

■ 1134. The armored division may be employed to exploit its own success and the successes of other troops by rapid attacks from the rear to overrun the hostile artillery, to destroy reserves and command and supply establishments, to break up hostile counterattacks, and to block strong reserves moving to restore the battle position or to occupy rear positions.

■ 1135. In exploiting a break-through the armored division is effectively employed to operate at great distances in the hostile rear areas to block routes of hostile movement, to attack strategic reserves, and to seize vital areas. In such operations, the division normally constitutes a part of a larger armored force which is closely followed by other mobile units, such as motorized divisions. Since the purpose of these operations is the complete destruction of the enemy, by placing a powerful striking force in his rear, the division moves through the area of the break-through at the greatest possible speed. Troops transported by air may be suitably employed in advance of the armored divisions. Opportunities for decisive exploitation by armored forces must be created.

■ 1136. Before directing exploitation or pursuit, the commander of the armored division must assure the required

supply of ammunition and motor fuel in combat elements. His plan must include provision for both supply and motor maintenance during the subsequent operations. Normally, little dependence should be placed on procuring motor fuel locally.

■ 1137. Once undertaken, pursuit must be boldly pushed with the utmost vigor and ruthlessness. Acting alone, the division organizes all combat elements for pursuit by direct pressure and by encirclement. A strong encircling force is provided. The tank units with the direct pressure force seek to pass through gaps which the attack may have opened in the hostile dispositions or to gain the rear of the enemy's covering force in order to attack the withdrawing hostile elements. The encircling force moves to strike the heads of the retreating columns by placing itself across the line of retreat on terrain favorable for its operation.

■ 1138. In a pursuit, when operating with large forces, the armored division reinforced with highly mobile units is normally employed as an encircling force.

■ 1139. In all pursuit operations, combat aviation acting in conjunction with the pursuing armored units materially assists in obtaining decisive results.

DEFENSIVE OPERATIONS

■ 1140. The employment of the armored division on a defensive position seriously restricts the use of its mobility and should be resorted to only in emergency.

■ 1141. Opposed to greatly superior armored forces, the division avoids decisive combat if its mission permits such action. If its mission requires it to gain time, it either occupies terrain unfavorable for hostile tank attacks or employs delaying tactics. When a position must be defended by the division against superior hostile armored troops, every advantage is taken of obstacles to protect the position and restrict the direction of the hostile attack.

The position selected should afford room for maneuver, suitable terrain for counterattacks and concealed routes of withdrawal. The units of the support echelon organize defense areas disposed in depth so as to take full advantage of

obstacles. The tank units prepare plans for counterattacks and for ambush against hostile tank units.

■ 1142. When the terrain is favorable, the armored division either alone or in cooperation with other forces may be employed in counterattack. The characteristics of the armored division may justify assigning it objectives considerably deeper or further to a flank than those whose capture would be necessary merely to restore the defensive position.

■ 1143. When a large force reinforced by armored divisions passes from the defensive to the offensive, the armored divisions may be employed rapidly to envelop a hostile flank or to form the spearhead of a penetration of a weak portion of the hostile front.

■ 1144. In delaying action against less mobile forces the support echelon operates against the heads of the advancing enemy units, while the tanks threaten or attack the hostile flanks and rear. Against hostile armored troops, every effort is made to locate each delaying position behind a formidable natural obstacle. Tank units protect the flanks and execute local counterattacks.

CHAPTER 16

GHQ TANK UNITS

■ 1145. Tank units of GHQ reserve consist of separate tank battalions and tank groups. A group is composed of a group headquarters and several tank battalions.

GHQ tank units are usually allotted to infantry, cavalry, and armored divisions for specific operations. One or more groups or several separate tank battalions may form the nucleus of a composite force, including the necessary supporting arms and services, for employment on tasks similar to those of the armored division. (See ch. 15.)

■ 1146. Properly employed, *tank units* constitute a powerful maneuvering force in the hands of a higher commander with which to influence the course of combat. In the defense they constitute an effective means of counterattack.

For the effective employment of tanks adequate air or map reconnaissance of the terrain and knowledge of the general hostile dispositions are essential.

Tanks are essentially offensive weapons; they are employed in mass on ground favorable to their characteristics, they are assigned missions, the accomplishment of which will assist the supported troops to reach their objectives, and, if practicable, to assist the main attack. When widely distributed or engaged piecemeal, tanks suffer rapid destruction from the concentrated fire of artillery and antitank weapons.

■ 1147. Tanks in the attack are given successive objectives. When hostile resistance at each objective is subdued, they reorganize and prepare for further employment. Tanks should not be tied too closely to foot troops. If so restricted, their mobility is sacrificed and they become a vulnerable target for antitank weapons.

In the attack, tanks are disposed in depth. The first echelon, supported by artillery and combat aviation, has the mission of destroying the hostile antitank guns.

The next echelon is composed of the tanks which accompany or immediately *precede* the other attacking units. The mission of this echelon is to overrun the hostile position just prior to the arrival of the assaulting troops and destroy the hostile automatic weapons which have survived the preparatory fires. Attacking troops promptly take advantage of the tank action, advance to and occupy each successive objective.

■ 1148. Occasionally, it is advisable to delay the entry into action of tanks until a late phase of the attack to replace the fire of artillery as it lifts for the assault, to supplement the diminished artillery fire when batteries are displacing, or because of the character of the terrain or the hostile antimechanized defenses.

■ 1149. The employment of tanks in no way lessens the need for strong fire support. Combat aviation and the supporting fires of artillery, chemical weapons, and other supporting weapons, are carefully coordinated with the advance of the leading echelon. The mission of fires supporting the tank action is to neutralize hostile antitank guns and hostile observation posts, to place protective fires on dangerous localities which tanks must pass, to destroy mine fields and obstacles, and to block the movement of hostile reserves, particularly antitank and mechanized units.

Observation aviation cooperates in the detection of obstacles, hostile artillery, and hostile forces assembling for counterattack, and provides liaison between the tanks and supporting fires.

Efficient signal communication between tanks and the supporting artillery and combat aviation is indispensable.

■ 1150. The employment of tanks in attack must surprise the enemy. When there is a possibility that the enemy has discovered the presence of tanks, their mobility must be exploited to keep the enemy in doubt and to deceive him regarding the front selected for their employment.

■ 1151. The strength of the antimechanized defense which will be encountered by a tank attack will depend largely upon the length of time the enemy has had to organize his position and the effectiveness of our measures for secrecy and deception.

When tanks are employed in an attack, intensive reconnaissance to discover antimechanized defenses must be initiated promptly and must be continued throughout the tank action.

When necessary, engineer troops with suitable equipment are attached to tank units to assist their advance. Mine fields and serious obstacles must be destroyed before the tank attack is launched. Their destruction must be accomplished at the last possible moment in order not to warn the enemy of the impending attack.

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