U. S. Army Military History Institute
FRAGILE BOOK
1120 1120
RETAIN IN ENVELOPE WHEN NOT IN USE

United States War Dept

FIELD SERVICE REGULATIONS
UNITED STATES ARMY
1923

PREPARED UNDER THE DIRECTION OF
THE CHIEF OF STAFF

1923

WASHINGTON
GOVERNMENT PRINTING OFFICE
1924

U
173
A5
1924
c.5

OCLC # 957911

WAR DEPARTMENT
Document No. 1120
Office of The Adjutant General

WAR DEPARTMENT,
WASHINGTON, *November 2, 1923.*

The following Field Service Regulations, revised by the General Staff of the Army, are approved and published for the information and government of the Army of the United States in the theater of operations and as the basis of instruction of the combined arms for war service.

Success in war can be achieved only by all branches and arms of the service mutually helping and supporting one another in the common effort to attain the desired end.

The basic principles of the combat tactics of the different arms are set forth in the Training Regulations of those arms. It is the function of higher troop leading so to combine and coordinate the combat tactics of all the arms as to develop in the combined forces the teamwork essential to success.

While the fundamental principles of war are neither very numerous nor complex, their application may be difficult and must not be limited by set rules. Departure from prescribed methods is at times necessary. A thorough knowledge of the principles of war and their application enables the leader to decide when such departure should be made and to determine what methods should bring success.

War is positive and requires positive action. All training should, therefore, aim to develop positive qualities of character rather than to encourage negative traits. The basis of training will be the attack.

Officers and men of all ranks and grades are given a certain independence in the execution of the tasks to which they are assigned and are expected to show initiative in meeting the different situations as they arise. Every individual, from the highest commander to the lowest private, must always remember that inaction and neglect of opportunities will warrant more severe censure than an error in the choice of the means.

The Field Service Regulations are drafted from the viewpoint of a war against an opponent organized for war on modern principles and equipped with all the means of modern warfare. An army capable of waging successful war under these conditions will prove adequate to any less grave emergency with which it may be confronted. The character of the opponent is a decisive factor in the selection of the means and methods of war. The nature of the theater of operations, particularly the facilities which it offers in respect to road and railroad communications, also exercises a material influence on the conduct of operations and the means employed.

The Field Service Regulations are designed especially for the government of the operations of large units and of small units forming a part of larger units. The general principles of the regulations apply to the action of small units operating separately. The scope of the Field Service Regulations is limited to the theater of land operations. Operations involving the employment of combined military and naval forces, such as oversea landing expeditions, coast defense, etc., are governed by special regulations.

Wherever reference is made in these regulations to the use of gas, such reference will be interpreted in the light of Article V, Treaty on Submarines and Noxious Gases, concluded at Washington, February 6, 1922, which is given in full in Appendix III, hereto.

[A. G. 062.12 (11-3-23).]

BY ORDER OF THE SECRETARY OF WAR:

J. L. HINES,
Major General, Acting Chief of Staff.

OFFICIAL:
ROBERT C. DAVIS,
The Adjutant General.

CONTENTS.

PART I.

OPERATIONS.

	Page.
Chapter I. Organization:	
Land forces of the United States	1
Tactical organization	1
Territorial organization	2
Tables of organization	3
Chapter II. Command and staff:	
Command	4
Staff	5
Chapter III. Orders:	
Field orders	6
Administrative orders	9
Annexes, maps, and tables	9
General, special, and verbal orders	10
Chapter IV. The combatant arms:	
The combined arms	11
Infantry	11
Artillery	14
Cavalry	17
Signal corps	19
Engineers	20
Air service	21
Chapter V. Information:	
Research of information	25
Counterinformation	26
Chapter VI. Transmission of orders, information, and reports—Diary:	
General principles	28
Message centers	28
Transmission by technical means	29
Transmission by messenger	31
Diary	31
Chapter VII. Reconnaissance:	
General principles	32
Aerial reconnaissance	34
Terrestrial reconnaissance	36
Chapter VIII. Security:	
General principles	41
Security on the march	42
Outposts	48
Chapter IX. Troop movements:	
General principles	55
Marches	56
Movements by motor transport	66
Movements by rail	68

	Page.
Chapter X. Shelter:	
General principles	72
Shelter during an advance (retreat)	73
Shelter in the communications zone	74
The selection of camp and bivouac sites	75
Sanitation	75
Chapter XI. Combat:	
General principles	77
Direction by the higher command	78
Frontage and depth of deployment	79
Reserves	80
Development	81
Assembly for action	82
Zones of action and sectors	82
Approach march	83
Artillery missions	83
Fire superiority	84
Gas and smoke	85
Terrain	86
Intrenchments	87
The offensive	88
Pursuit	100
The defensive	101
Withdrawal from action	112
Delaying action	113
Chapter XII. Special operations:	
Night operations	114
Combat in woods	115
River crossings	116

PART II.

ADMINISTRATION.

Chapter I. Supply and replacements:	
General principles	121
Classification of supplies	122
Organization and administration of the communications zone	123
Terminology of supply points	128
Transportation	129
The issue of supplies	137
Salvage	141
Traffic control	141
Personnel replacements	142
Animal replacements	143
Chapter II. Hospitalization and evacuation:	
General principles	145
Medical service in combat	146
Medical service in the communications zone	148
Medical service in shelter	148
Medical service on the march	149
Medical service in cavalry commands	149
Protection of medical personnel and establishments	149
Volunteer aid	149
Evacuation and hospitalization of animals	149

Page.
Chapter III. Military police ---------- 152
Chapter IV. Censorship:
General principles ---------- 153
Correspondents ---------- 153
Chapter V. Military postal service ---------- 155

APPENDICES.

Appendix I. Forms of field and administrative orders and march table -- 156
Appendix II. List of abbreviations ---------- 166
Appendix III. Article V, Treaty on Submarines and Noxious Gases ----- 171
Appendices IV–XVIII. Plates ---------- 172–186

FIELD SERVICE REGULATIONS, UNITED STATES ARMY.

PART I. OPERATIONS.

CHAPTER I.

ORGANIZATION.

LAND FORCES OF THE UNITED STATES.

1. Composition.—Congress determines the strength and character of the peace and war establishments and the classes of citizens, their number and requisite qualifications, available for military service.

The organized land forces consist of the Regular Army, the National Guard, and the Organized Reserves.

The unorganized land forces comprise all persons, not included in the organized forces, who have been or may be declared by Congress to be available for military service. They constitute the source from which the untrained man power is obtained.

Instructions relative to mobilization are published in War Department regulations on that subject.

TACTICAL ORGANIZATION.

2. The field forces are organized into divisions, corps, armies, groups of armies, and the general headquarters, including general headquarters reserve.

The term "large units" as employed in the text of these regulations refers to divisions, corps, armies, and groups of armies.

3. The division.—The division is the elementary organic unit of the combined arms. It comprises in its organization the essential combatant and administrative branches, all in correct proportion and so organized as to make it tactically and administratively a self-contained unit, capable of independent action.

The infantry division is the basis of organization of the field forces.

The cavalry division is normally the largest cavalry unit.

4. The corps.—The corps is composed of a headquarters, certain auxiliary troops and trains called corps troops, and two or more infantry divisions. While organized primarily for tactical purposes, the corps is nevertheless charged with those administrative functions incident to the distribution of supplies to its organic units.

5. The army.—The army is composed of a headquarters, a body of auxiliary troops and trains called army troops, and two or more corps. In addition, certain troops of the G. H. Q. reserve are attached from time to time as their special services are needed. The army has territorial, strategical, and tactical functions. It is organized in all its branches for operation and administration, and is capable of independent action wherever required. It plans and executes the broader phases of strategical and tactical operations necessary to carry out that part of a given strategical mission directly assigned it by higher authority.

6. The group of armies.—Two or more armies may be organized into a group of armies under a designated commander. This may be advisable when

the front of the theater of operations is so extended or the number of armies is so large as to render difficult direct control by one headquarters, when the armies are separated by obstacles, or when the strategical mission of the forces in one part of the theater is distinct from that in others. The commander of each group, assisted by an appropriate staff, directs the operations of his group under the general instructions of the commander of the theater of operations.

7. The general headquarters.—The headquarters of the commander of the field forces is the general headquarters. It comes into existence on the outbreak of war.

The commander of the field forces exercises control over all the theaters of operations, specifying, regulating, and coordinating the operations therein in accordance with the general policies prescribed by the President and under the general direction of the Secretary of War. He specifies the personnel and supplies of all kinds required for the field forces, requests their allocation, and establishes policies and priorities for their distribution.

The G. H. Q. reserve comprises organically those troops which are not habitually required by an army. Units of the G. H. Q. reserve are allotted by the commander of the field forces to theaters of operations in accordance with their requirements. Within each theater allotment is made to armies or groups of armies of additional special troops of the types and strength required for the particular operation involved.

TERRITORIAL ORGANIZATION.

8. The theater of war comprises those areas of land and sea which are or may become directly involved in the operations of war.

9. The theater of operations.—The theater of operations comprises the area of the theater of war in which operations are conducted. It comprises initially territory that is to be invaded or defended, designated by the War Department in accordance with the determined strategical policy, desired lines of action, and availability of communications. It is divided normally into a communications zone and a combat zone. The boundary between the theater of operations and the zone of the interior is determined on the principle that only such territory as is necessary for the efficient prosecution of operations, including the immediate supply of the troops therein, is included in the theater of operations.

10. Zone of the interior.—The zone of the interior in general comprises that area of the national territory not included in theaters of operations.

The mission of the zone of the interior is to exploit and develop the national resources in men and material required for military purposes and to supply the means required by the commander of the field forces at such times, in such quantities, at such places, and in such manner and form as will assure him the freedom of action necessary for the accomplishment of his mission.

This mission is carried into execution under the authority of the Secretary of War by the War Department organization as represented by the office of the Assistant Secretary of War, the War Department General Staff, the War Department supply, technical, and administrative branches, and corps area and department commanders.

11. The combat zone.—The combat zone comprises the area of the theater of operations required for the active operations of the combatant forces.

It is divided into army, corps, and division areas, each comprising the zone of operations of the unit to which it pertains.

The combat zone, in general, contains no fixed supply nor hospitalization establishments.

12. The communications zone.—The communications zone is the part of the theater of operations containing the establishments of supply and evacuation, lines of communication, and other agencies required for the immediate support and maintenance of the entire forces in the theater of operations.

It includes all of the territory between the rear boundary of the theater of operations and the combat zone. Laterally, it includes all the area necessary to provide for the proper operation of supply, hospitalization, and transportation facilities and for the defense thereof.

TABLES OF ORGANIZATION.

13. The details of organization and the amounts and kinds of transportation and major items of equipment are published in tables of organization.

CHAPTER II.

COMMAND AND STAFF.

COMMAND.

14. Command is the authority which an individual in the military service lawfully exercises over subordinates by virtue of rank or assignment.

15. Command and leadership are inseparable. The qualities of leadership are indispensable to a commander. Whether the command be large or small, and whether the exercise of the functions of command be complex or simple, the commander must be the controlling head, his must be the master mind, and from him must flow the energy and the impulse which are to animate all under him.

16. In the practice of his task, the commander must keep in close touch with all subordinate units by means of personal visits and observation; it is essential that he know from personal contact the mental, moral, and physical state of his troops, the conditions with which they are confronted, their accomplishments, their desires, their needs, and their views, and that he promptly extend recognition for services well done, extend help where help is needed and give encouragement in adversity, but never hesitate to exact whatever effort is necessary to attain the desired end. Considerate and devoted to those whom he commands, he should be faithful and loyal to those who command him.

17. Unity of command is essential to success. All the troops assigned to the execution of a distinct task must be placed under one command.

18. Decision as to the course of action to be pursued in any given case is the responsibility of the commander and presupposes on his part an analysis of all the facts and factors having a bearing on the particular problem under consideration. It is the task of the staff to furnish the commander with such information, data, and advice as he may require in reaching his decision.

In estimating a situation, the commander considers his mission as set forth in the orders and instructions under which he is acting, or as deduced by him from his knowledge of the situation, all available information of the enemy (strength, position, movements, probable intentions, etc.), conditions affecting his own command (strength, position, supporting troops, etc.), and the terrain, weather, climate, morale, and other factors in so far as they affect the particular military situation. He then compares the various plans of action open to him and decides upon the one that will best enable him to accomplish his mission.

In general, it is the function of the staff to elaborate the details necessary to carry the decision into effect.

19. Personal conferences between the higher commanders and the subordinates who are to execute their orders may at times be advisable, in order that the latter may arrive at a correct understanding of the plans and intentions of their superiors and may correctly interpret the orders issued. But such conferences are not for the purpose of criticizing the orders or plans of the higher commander, nor to influence the latter's action. The officer issuing the order can not share the responsibility therefor with any of his subordinates. The decision, no matter how arrived at, is his alone.

20. Commanders of subordinate units can not plead absence of orders or the nonreceipt of orders as an excuse for inactivity in a situation where action on their part is desirable, or where a change in the situation upon which the

orders issued were based renders such orders impracticable or impossible of execution. If the subordinate commander knows what the general plan—the end in view—is, lack of initiative on his part is inexcusable.

21. All orders and instructions from a higher unit for a subordinate unit are given to the commander thereof, and all orders and instructions for any element or elements of a subordinate unit emanate from the immediate commander of such unit. By this means alone, authority and responsibility are definitely fixed and the channels of command definitely established. When, in an emergency, an order is given otherwise than through military channels, the superior of the unit concerned is promptly notified as to the purport of the order.

STAFF.

22. The staff functions of the headquarters of units larger than a brigade may be separated into two groups, i. e., (1) general staff; and (2) technical, supply, and administrative staff.

23. The general staff.—The chief of staff is the chief adviser and personal representative of the commander. He assists the commander in the supervision and coordination of the command and should enjoy his complete confidence and a considerable degree of independence in the performance of his duties. He is responsible for the working of the whole staff, and, under the orders of his commander, for the control and coordination of the operations of the troops. His powers of supervision, coordination, and control in the commander's name are coextensive with this responsibility and are exercised to the extent that he deems necessary to its discharge.

The general staff of field commands is organized into four divisions with the duties of each as prescribed in the Staff Manual (TR 550-5).

24. Technical, supply, and administrative staff.—This includes those officers of the various branches who may be assigned to a headquarters. The duties appropriate to their office are prescribed in the Staff Manual (TR 550-5).

CHAPTER III.

ORDERS.

25. The art of giving proper instructions and orders to troops is an important feature in the exercise of command.

Clear and decisive orders are the logical result of definite and sure decisions, and are the means of transforming the decision into action.

To frame a suitable order the leader must first make an estimate of the situation, culminating in a decision upon a definite plan of action. He or his staff must then actually draft or word the orders which will carry his decision into effect.

Brevity is always to be regarded as a major virtue in an order, so long as it does not operate to exclude other essential qualities.

26. At the beginning of operations, and from time to time thereafter, the plans of the superior leaders are communicated in the form of letters of instruction. These regulate movements over large areas and for considerable periods of time.

FIELD ORDERS.

27. Field orders regulate the operative and tactical actions of troops and such strategical dispositions as are not covered by letters of instruction.

The field orders of division and higher commanders are almost invariably written. When conditions demand the issuance of verbal orders, written orders follow. The field orders of brigades and regiments are usually written or dictated; those of lower units, dictated or verbal.

The object of field orders is to bring about a course of action, in accordance with the intention of the leader, suited to the situation and with full cooperation between all arms and services. They are issued for marches, halts, establishment of camps or bivouacs, advance, flank and rear guards, outposts, combats, etc.

In active operations, especially during engagements, numerous field orders are issued in fragmentary form—either verbally or in the form of notes, brief dispatches, messages, orders for assembly, etc.—which do not contain all the requirements of a formal written field order, but whenever detailed instructions for operations are given, whether verbally or in writing, the sequence prescribed for the body of a formal field order is preserved.

28. To give subordinate leaders an opportunity to study the situation and to issue their own instructions, field orders should reach them in ample time. As a rule, however, it is desirable to keep contemplated movements secret as long as possible, and to confine knowledge thereof to higher staff officers and leaders of the larger units.

The time required for orders to reach all the lower units depends not only upon the size of the command but its situation as regards concentration or dispersion, whether in contact with the enemy, availability of communications, state of weather, etc. It is one of the factors which must be taken into consideration when issuing orders. The following may be regarded as the probable minimum periods required, even under favorable conditions:

For a regiment	1½ hours.
For a brigade	3 hours.
For a division	6 hours.

29. In framing field orders, the integrity of tactical units is preserved whenever practicable.

Field orders must be clear and definite. Expressions depending upon the viewpoint of the observer, such as right, left, in front of, behind, on this side, beyond, etc., are avoided, reference being made to points of the compass instead. The terms right and left, however, may be applied to individuals or bodies of men, or to the banks of a stream; in the latter case, the observer is supposed to be facing downstream. The terms right flank and left flank are fixed designations. They apply primarily to the right and left of a command when facing the enemy and do not change when the command is retreating. The head of a column is its leading element, no matter in what direction the column is facing; the other extremity is the tail.

To minimize the possibility of error, geographical names are written or printed in ROMAN CAPITALS; when the spelling does not conform to the pronunciation, the latter is shown phonetically in parentheses, thus: BICESTER (Bister), GILA (Hee'-la).

When two or more places or features on the map have the same name they are distinguished by reference to other points.

A road is designated by connecting two or more names of places on the road with dashes, thus: LEAVENWORTH—LOWEMONT—ATCHISON road.

As a rule, an affirmative form of expression is used. Such an order as: "The supply column will not accompany the division," is defective because the gist of the order depends upon the single word "not."

Written orders should be so distinct as to be legible even in bad light.

Field orders are brief; short sentences are easily understood; conjectures, expectations, reasons for measures adopted, and detailed instructions for a variety of possible events do not inspire confidence and should be avoided.

The commander should accept the entire responsibility. In framing field orders, such expressions as "attempt to capture," "try to hold," "as far as possible," "as well as you can," etc., are forbidden. They tend to divide responsibility between the commander and his subordinates.

An order should not trespass upon the province of a subordinate. It should contain everything beyond the independent authority of the subordinate, but nothing more.

When the transmission of orders involves a considerable period of time during which the situation may change, detailed instructions are avoided. The same rule holds when orders may have to be carried out under unforeseen circumstances. In such cases, letters of instruction are preferable; they lay stress upon the object to be attained, and leave open the means to be employed. Orders attempting to arrange matters too far in advance may have to be recalled and others substituted; such changes impose needless hardships upon a command and injure its morale.

Details of time and place are carefully stated. Subordinate commanders and staff officers regulate their watches by the time kept at headquarters.

Orders issued by subordinates should not be mere repetitions of those from higher authority with additions of their own. New orders are clearer and more satisfactory.

30. To enable the will of the commander to be quickly understood, to secure prompt cooperation among his subordinates, and for ready reference, field orders are required to follow a general form. This form divides an order into sections or parts and assigns a particular subject matter to each.

The parts of a field order are—

The heading.
The distribution of troops (in certain orders).
The body.
The ending.

31. The heading.—The heading contains the title, the place, date, and hour of issue; the number of the order, and reference to the map or maps used.

The title is the official designation of the command. It may, where circumstances require, be shown by a code name.

Titles are expressed as follows:

Det. 1st Div.
Advance Guard, 3d Div.
5th Div.
VI Army Corps.
Second Army.

If the need for secrecy requires it, the place of issue is omitted.

The hour stated in the heading is the hour when the order is ready for distribution.

Dates in the heading are abbreviated thus: 4 Feb. 23, 2-45 P. M.

Field orders of a command are numbered consecutively for the period of the war.

The map reference designates the maps required, together with the scale and the names of sheets.

32. The distribution of troops.—The distribution of troops shows the tactical components into which the command is divided (advance guard, main body, etc.) and the troops assigned to each. Its use is generally limited to march and outpost orders and to the first field order issued by a newly created command. When a distribution of troops is used, it is headed "troops" and follows paragraph 2 of the order, without number, or is placed on the left of the body, occupying about one-third of the page. The tactical components are marked with lettered subheads (a), (b), (c), etc., the troops listed under each performing the task prescribed in the correspondingly marked subparagraphs of paragraph 3 of the order.

33. The body.—The body of the order contains information and instructions for the command and is arranged in numbered paragraphs as follows:

Paragraph 1 contains such information of the enemy and of friendly supporting troops as is necessary for subordinates to know to enable them to perform their assigned tasks. It is devoted exclusively to information and contains no part of the plan or detailed instructions of the commander.

Paragraph 2 contains the general plan of the commander, or so much thereof as will insure cooperation of all parts of the command. It also, when appropriate, gives the general scheme of maneuver by which the plan is to be executed.

Paragraph 3 contains the detailed tactical dispositions adopted by the commander to carry out the plan outlined in paragraph 2, including the tasks assigned to each of the several combatant fractions of the command. These tasks are given under lettered subheads (a), (b), etc., the leading fraction, or the one having the most important duty to perform, being generally considered first.

Instructions applicable to all of these fractions may be embodied in a subparagraph, letter (x), at the end of paragraph 3.

Paragraph 4 contains instructions regarding administration, traffic, supply, and evacuation. In commands smaller than the division, this paragraph is complete in itself and contains all necessary information regarding trains, ration

and ammunition distributing points, refilling points, collecting and aid stations, and other administrative matter. In divisions and higher units, the administrative details may, under certain circumstances, be too voluminous to be embodied in full in paragraph 4 of the field orders, in which case administrative instructions are given in an administrative order, and paragraph 4 is limited to a reference thereto (e. g., "See Administrative Orders, No. 3") and to prescribing such special administrative matters as immediately and directly affect tactical dispositions of lower combatant units when administrative details can not accompany the field orders.

Paragraph 5 contains instructions regarding signal communications and shows where the commander can be found or where messages may be sent.

34. The ending.—The ending contains the authentication of the order; a list of appended documents, if any; and the distribution. The statement as to the distribution is an essential feature of a field order; its purpose is to insure that the order is distributed to every officer or unit directly concerned with its execution.

35. No abbreviations are used in the body of the order except A. M. and P. M. for morning and afternoon, the authorized abbreviations for tactical organizations, and those customary in designating rank. In naming a night, both days should be mentioned thus: Night, 4/5 Feb. 23. To designate "noon" and "midnight" these words are written.[1]

ADMINISTRATIVE ORDERS.

36. Administrative orders are employed for issuing instructions regarding administration, traffic, supply, and evacuation under circumstances where the instructions regarding those matters are too voluminous to be embodied in paragraph 4 of the field order, and at other times when it becomes necessary to publish administrative instructions of this character to the command. When such order accompanies a field order, reference is made to the latter, as: Administrative Orders, No. 3 (to accompany Field Orders, No. 1).

The heading and ending are similar to those of the field order.

The body of the order contains information and instructions for the command as a whole regarding any or all of the following matters as may be necessary:

1. Supply (railheads, refilling points, and distributing points).
2. Evacuation of men and animals.
3. Traffic (restrictions, maintenance of roads, and circulation).
4. Trains (disposition, movement, and special assignments).
5. Personnel.
6. Miscellaneous.[1]

ANNEXES, MAPS, AND TABLES.

37. Annexes covering the details of execution of certain aspects of operations are employed to amplify the field orders of divisions and larger units when the amount of detail is too voluminous to permit of its inclusion in the field order. Such annexes usually consist of the field orders of the auxiliary arms; reference is made to them in the appropriate subparagraph of the field order which they are designed to amplify.

38. It is frequently advantageous and convenient to employ maps and tables as appendices to field and administrative orders and their annexes. For example: March tables, entraining tables, situation and operation maps, intelligence maps, artillery maps, circulation and supply maps.

---

[1] For form of orders see Appendix I.

GENERAL, SPECIAL, AND VERBAL ORDERS.

39. General orders include, generally, (1) all detailed instructions necessary in carrying out certain general regulations or orders issued from a superior headquarters; (2) all standing instructions, to the end that frequent repetition may be avoided; and (3) proceedings of general and special courts-martial.

General orders are issued by commanders of separate battalions and all higher units.

The instructions of battalions forming parts of regiments, and those of smaller units and detachments, relative to the same class of subject matter as is promulgated by higher commanders in general orders are designated as "orders."

40. Special orders cover only such matters relating to the movements or assignment of individuals as are not necessary to be communicated generally to the command.

41. When not communicated by the leader in person, verbal orders are delivered by staff officers or messengers. Important verbal orders are recorded as soon as practicable after issue.

As there is always a possibility of controversy as to their wording, verbal orders are sent by messengers in cases of necessity only, and when so sent rarely contain more than one definite mandate. For example: "The brigade will halt three hours at ———." More latitude is allowed in sending verbal orders by officers.

The bearer of a verbal order or message is required to repeat it before starting.

CHAPTER IV.

THE COMBATANT ARMS.

THE COMBINED ARMS.

42. The combatant arms are the infantry, the artillery, the cavalry, the signal corps, the engineers, and the air service.

43. No one arm wins battles. The combined employment of all arms is essential to success. The special characteristics of each arm adapt it to the performance of special functions in execution of the mission of the unit in which the action of all is combined. It is the task of higher commanders to coordinate and direct the action of each arm with a view to the most efficient exploitation of its powers and their adaptation to the ends sought.

44. The coordinating principle which underlies the employment of the combined arms is that the mission of the infantry is the general mission of the entire force. The special missions of other arms are derived from their powers to contribute to the execution of the infantry mission.

45. The relation of the missions of the several auxiliary arms to the infantry mission governs their general distribution in combat. Distribution of the infantry in depth and in width requires a corresponding width and depth in the general distribution of the means of support. Distribution of the infantry in considerable depth frequently operates to prevent the lending of the necessary support by rearward concentrations and requires that all the means necessary for dealing with the various combat situations be in a considerable measure immediately at hand. This requirement frequently results in a distribution of troops based upon the formation of combat groupings composed of elements of several arms instead of a distribution based exclusively upon arm of service. The formation of such groupings may also result from great extension in width.

INFANTRY.

46. Infantry is essentially the arm of close combat. This rôle rather than the nature of its armament distinguishes the infantry as a combatant arm. The armament of infantry is adapted to the execution of its mission as the arm of close combat.

47. Infantry fighting power rests upon the basis of morale. Superior morale furnishes the impulse that carries the infantry forward in attack and the staying power that holds it to positions in defense.

It is the special duty of the higher command to stimulate and cultivate the fighting spirit, aggressiveness, and initiative of the infantry soldier.

The morale of infantry is subjected to a greater strain than that of any other arm through the heavier burden which it bears in combat and on the march. The necessity for exacting the utmost expenditure of its physical and moral strength at critical junctures in the course of operations requires that at other times all possible measures be taken for the conservation of its energies and the avoidance of unnecessary hardship and fatigue.

48. Infantry has two general means of action: Fire and movement. Infantry fights by combining these two means of action.

Fire constitutes its principal means of destruction. Fire is also one of its principal means of neutralization. Through the destructive and neutralizing effects of its fire, infantry assists in creating the conditions that facilitate its own movement and check the movement of the enemy.

Through movement, infantry increases the destructive power inherent in its fire by gaining such a position relative to the enemy as will permit of the development of a fire superior to that of the enemy, either by virtue of its range, its direction (flanking or from the rear), or its volume (enveloping action).

The moral and material superiority attained through superiority of fire is confirmed in the assault.

49. Infantry fire has highly destructive effects against unsheltered personnel. Against troops under cover, these effects are greatly reduced. Against material objectives, infantry fire has little power.

The mobility of infantry adapts it to movements on all characters of terrain. Its ability to move in small and inconspicuous formations enables it to minimize the effects of hostile fire, to take advantage of covered routes of approach, and employ the minor accidents of the terrain as firing and cover positions.

Infantry alone thus possesses the power to close with the enemy and enforce the decision of battle. Its forward movement is the indispensable condition of victory.

50. Infantry possesses the power of both fire and movement in a relatively constant degree. It retains this power under varied conditions of terrain and combat.

Under a situation permitting freedom of maneuver, infantry has considerable power of independent offensive action through the employment of its own means. This power falls off rapidly with limitation in freedom of maneuver, and becomes a minimum under conditions which require a frontal advance against an organized defensive position. Under these conditions, the concentration of powerful supporting elements becomes an indispensable prerequisite to successful offensive action. Under the same conditions, the defensive power of infantry fire reaches a maximum, but its vulnerability to neutralization by artillery fire correspondingly increases.

51. The primary mission of the infantry is to close with the enemy in attack and destroy or capture him on his positions; in defense, to check his advance, hold its own positions, and throw back the attacking forces by counterattack.

In attack, the infantry advance is directed with a view to the successive occupation of those features of the terrain which will constitute supporting points for a further advance. In defense, the infantry holds a line of resistance which bears relation to those features of the terrain essential to the progression of the attack or to the assumption of counteroffensive; its machine guns constitute the skeleton of the defensive position.

52. Infantry is equipped with an armament which enables it to discharge the various missions which fall to it in combat. Its principal offensive weapon is the rifle and bayonet. Its automatic weapons reinforce the fire power of its rifles and contribute to the attainment of the fire superiority upon which the ability of the infantry to advance depends; in defense, they constitute the most powerful weapons of the holding elements which make possible the action of the counterattack. Infantry is equipped with light cannon and tanks for dealing with resistances which are protected against the effects of other infantry weapons. Elements of other arms are, when the situation requires it, attached to it for combat.

53. Infantry combat tactics are based upon the development of the powers of the individual fighting man. When the opponent's tactics are based upon the fire power of light machine guns or automatic rifles, riflemen seek to destroy the basis of the hostile combat action by concentrating their fire on the hostile light machine gunners or automatic riflemen.

54. The elementary unit of infantry organization is the squad, the largest unit admitting of direct personal leadership in combat. The action of squads is combined in the platoon.

The basic unit of infantry organization is the company, which comprises several platoons, together with the agencies necessary to their subsistence, interior economy, and administration.

The employment of all infantry weapons is normally combined in the battalion. The battalion, reinforced by infantry cannon, and in the proper case by tanks, constitutes the complete unit of infantry combat, capable of assignment to a mission requiring the application of all infantry means of action.

The regiment is a combination of several battalions and a company equipped with infantry cannon, together with the units necessary for intelligence service, supply, and signal service of the regiment. It constitutes the complete tactical and administrative unit.

The action of regiments is combined in the brigade.

55. The operative mobility of infantry can be increased by the employment of motor transportation.

Motor transportation finds limited tactical employment in the use of tanks and cross-country tractors.

56. Tanks are mechanically propelled armored vehicles combining the powers of fire and shock action. They are especially designed for movement across country and participation in the close combat of infantry. They provide a means for advancing infantry weapons or other close-combat matériel under artificial cover invulnerable to the ordinary effects of rifle and machine-gun fire, shrapnel, and shell splinters. Their combat powers are derived from the fire power of the weapons which they transport and the shock power of the tanks themselves.

57. The tank constitutes an armored infantry element possessing protective properties that enable it to close with intrenched defensive groups protected against the effects of ordinary infantry fire. Its essential mission is to assist in the progression of the infantry by overcoming or neutralizing resistances or breaking down obstacles that check the infantry advance.

Tanks find their most intensive application under conditions that tend to limit infantry power of maneuver.

58. Tanks are essentially offensive agencies. Their utility on the defensive is normally limited to employment in connection with counterattacks.

59. The chief rôle of the tank is participation in the assault. It does not normally participate in the phases of combat prior to the assault. Its vulnerability to artillery fire requires that its approach to assaulting distance be screened as far as practicable from hostile observation and that it be kept under cover when not in movement.

60. Tanks have a limited radius of action requiring replacement, overhauling, and repair in order to insure continuity of operation. Tank replacement in combat is a tactical operation and is regulated by commanders in accordance with the requirements of the situation.

61. The elementary tank unit is the platoon comprising the largest number of tanks that can be efficiently operated under the direct control of a single leader.

The company comprises several platoons together with the agencies necessary to tank maintenance and replacement. The company is the basic tactical unit of tank organization; as it is the smallest unit equipped with means of replacement, it is normally the smallest unit which can be detached for the execution of a mission requiring continuity of action.

Higher tank units are the battalion and the group. They are equipped with special means of maintenance and replacement.

62. Tank groups are assigned to the G. H. Q. reserve. Tank elements are allotted to armies and lower units from the G. H. Q. reserve in accordance with the requirements of the situation.

63. The signal tanks pertaining to tank units constitute elements in the general system of infantry communications.

ARTILLERY.

64. Artillery is an arm of relatively long-range combat. Its close-range protection is, in the main, afforded by the troops deployed in its front or when necessary by the assignment of a special support. Special protection is ordinarily required only on exposed flanks.

65. Fire constitutes the sole means of artillery combat. Artillery contributes to the power of movement of the entire force through the fire support which it renders other arms; its own movement is to insure this support.

66. Artillery fire possesses great power of destruction and neutralization. It is the principal means of attack against material objectives. The curved trajectory of howitzers and mortars enables them to reach personnel defiladed against flat-trajectory fire or protected by ordinary overhead cover. The wide radius of effect of artillery projectiles compels hostile troops in the open to move in widely deployed formations. Through its great ranges, artillery is able to reach objectives located far in rear of the leading hostile elements. It has a limited power of interdicting areas to the movement of hostile troops.

67. Artillery fire produces great moral effects due to the strong detonation of its projectiles. This effect increases with the size of the explosive charge, the suddenness with which fire is opened, and the extent to which the fire is concentrated. The depression in hostile morale produced by the sudden opening of concentrated fire can often be continued by the fire of only a part of the artillery originally employed, thus permitting the transfer of the fire of the remainder to other objectives. Moral effect is always given consideration in plans for the employment of the artillery.

68. In consequence of its great range, artillery fire possesses a high degree of flexibility. It is thus capable of intervening over a zone of great width and depth and of rapidly transferring its fire in accordance with the requirements of combat. Through the maneuver of the fire of artillery, higher commanders possess a powerful means of influencing the course of combat after the infantry has been committed to action.

69. The flexibility of artillery fire makes possible the concentration of large masses of artillery under a common fire direction. Such concentrations are, under certain conditions, capable of being directed with annihilating effects against critical objectives in the zone of combat.

70. The efficiency of artillery concentrations depends upon effective observation and the uninterrupted functioning of lines of signal communication. In the preparation of a deliberately organized attack or defense, it is possible to organize a complete observation service and to install the lines of signal communication required for the efficient direction of fire by higher commanders. In subsequent operations, however, and in more rapidly organized attack and defense, the less completely organized observation service and the insufficiency or failure of signal communications operate against efficient fire direction by higher commanders. In such situations a greater degree of decentralization in the direction of artillery fire becomes necessary.

Concentration of fire does not require close concentration of the matériel. Artillery in firing positions is distributed with a view to minimizing the possibilities of a simultaneous neutralization of a large number of batteries.

71. Decentralization of the direction of artillery fire results from the assignment of artillery units to the support of specified infantry or cavalry units or to the support of the component large units of a higher command.

Decentralization shortens the lines of signal communication required for the direction of fire. It enables artillery units to act with greater promptness in meeting the requirements of a rapidly changing situation on the front of the units

which they support. It permits of more direct cooperation between the artillery and the troops which it supports and enables it, when necessary and practicable, to participate in the close combat of infantry. In certain situations, as, for example, when visibility of the terrain is restricted or the command is greatly extended, concentrations are not practicable and decentralization becomes necessary.

The requirements of decentralization must be met in such a way that the ability to effect concentrations of the entire artillery fire power of large units is retained in the largest possible measure. In cases where the direction of artillery fire has been decentralized to lower artillery units, higher artillery commanders retain, as far as practicable, the power to resume centralized control except in cases where artillery elements have been attached to infantry units by superior authority.

The artillery of a unit is ordinarily so distributed that a fraction of its strength is assigned to the support of particular units and the remainder retained under the direction of the chief of artillery of the unit for employment in support of the action of the entire unit.

72. Assignment of a supporting mission to an artillery unit does not imply subordination of the supporting unit to the commander of the unit supported unless the orders of the superior commander expressly so state.

So long as the superior commander is able to exercise effective control of the entire fire of the artillery of his unit, he does not delegate control of any portion of the supporting artillery to subordinate commanders. When, however, as the result of unusual extension of frontage or restricted visibility of the terrain, he can not efficiently direct the fire of the supporting artillery, he should promptly place it under the orders of the commanders of the units supported. Unity of command requires that the responsibility for the success of an operation be not divided.

73. The principal mission of artillery is to support the infantry by fire. Its most important targets are those hostile elements which are most dangerous to infantry or most hinder infantry success.

The employment of artillery fire is regulated by the needs of the infantry in the various phases of combat.

During a march in close proximity to the enemy, the situation often requires a portion of the artillery to occupy positions in readiness or observation in order to assure that the infantry does not come under hostile fire without artillery support.

In the preparation of the attack, the artillery executes the necessary material destructions, neutralizes, as far as possible, hostile fire power, and interdicts to hostile movement the approaches to the enemy position.

In the course of the attack it accompanies the infantry advance by fire on the nearest hostile elements, covers it against fire, counterattack, and observation from rearward defensive elements by counterbattery and by fire on rearward enemy positions, assembly points of hostile reserves, and observation and command posts, and continues its interdiction fires on the enemy line of communications.

In defense, it endeavors to check the hostile advance by fire on hostile forces during their approach march, to break up the attack by counteroffensive preparation in the form of concentrations placed on the actual or suspected assembly positions of the attack, or to stop the hostile advance by fire on the attacking infantry after the attack has been launched. It engages the hostile artillery by counterbattery and delivers interdiction fire.

74. From the viewpoint of the mobility and the ballistic properties of the matériel, artillery is classified as light, medium, and heavy.

Light artillery comprises guns of approximately 3 inches and howitzers of approximately 4 inches in caliber.

Medium artillery comprises guns from 4.7 to 5 inches and howitzers of approximately 6 inches in caliber.

Heavy artillery comprises guns of 6 inches in caliber and larger calibers, and howitzers and mortars of a caliber in excess of 6 inches.

75. The organic assignment of the various classes of artillery which enter into the composition of large units is based upon their tactical mobility and ballistic qualities.

In principle, light artillery is assigned to infantry and cavalry divisions, medium artillery to corps, and heavy artillery to the G. H. Q. reserve. The G. H. Q. reserve also includes units of light and medium artillery and the artillery of special purpose: Pack artillery, trench artillery, and railroad artillery. Armies are allotted artillery from the G. H. Q. reserve in accordance with their needs in each case.

Variation from this principle of assignment may be made necessary through inavailability of the required matériel.

76. The artillery missions of the several large units are adapted to the characteristics of the matériel at their disposal and the relative importance of the objectives.

Divisional artillery is most effective in fire on personnel. Its principal mission is the direct support of the infantry. Light guns are the principal weapons of antitank defense. Light artillery is also employed to blind hostile observation by means of smoke screens. Within the limits of its ranges, it is effective in counterbattery fire on lightly protected batteries and in interdiction fire. In a lesser degree, it is effective in the execution of certain classes of destruction fire (e. g., destruction of accessory defenses).

The primary mission of corps artillery is the destruction or neutralization of hostile batteries, the destruction of hostile defenses, and long-range interdiction fire. It is also employed in fire on personnel.

Heavy artillery is most effective in destruction fire against material objectives of an especially resistant nature, in counterbattery, and in distant interdiction and destruction fire. Flat-trajectory guns are employed in fire on observation balloons.

The truck artillery of the G. H. Q. reserve (light artillery) has the ballistic properties of the divisional artillery, greater strategic mobility, but less tactical mobility. Its principal missions are executed in connection with strategic concentrations for the attack of fortified positions. The pack, trench, and railway artillery of the G. H. Q. reserve find employment in special situations.

The employment of the various classes of artillery matériel is not restricted to the missions to which their properties especially adapt them. Within the limitations of the matériel, all classes of artillery are, when necessary, employed against the objectives of most decisive importance.

The organic corps and divisional artillery may be reinforced by the attachment of artillery at the disposition of higher units.

77. Artillery is organized with a view to the most efficient development of its fire power and the constitution of suitable groups for the execution of its supporting missions.

The basic fire unit of artillery is the battery, normally the largest unit in which the fire is conducted by a single leader.

Battalions, regiments, and brigades are units of fire direction and tactical control; they constitute suitable groups for the support of infantry and cavalry units or of the component large units of the command to which they pertain.

When occasion requires—particularly when there is a great massing of artillery—temporary groupings of batteries, battalions, or regiments may be formed for

convenience in the execution of missions. These groupings are based upon the nature of the mission to be executed rather than upon type or caliber. Tactical unity is, as far as practicable, respected in the composition of groupings.

78. The organization of corps and higher commands includes antiaircraft artillery units, equipped with antiaircraft guns, machine guns, searchlights, and the matériel required for observation, listening, flash and sound ranging, and signal communications.

In principle, other combatant arms and other artillery units take the necessary measures for their own immediate protection against low-flying hostile aircraft.

Antiaircraft artillery reinforces the antiaircraft measures of other arms and units and operates especially against hostile aircraft flying beyond the range of their matériel. By driving hostile aircraft to higher altitudes, it decreases the effectiveness of enemy observation, fire control, and bombardment. Its searchlights and listening service enable it to operate by night.

Antiaircraft artillery is also employed in the immediate protection of sensitive points in the areas in rear of the leading troops.

Antiaircraft artillery cooperates closely with the air service. In night defense, its searchlights create illuminated zones within which the night pursuit of the air service is enabled to attack hostile aircraft coming under observation.

Antiaircraft artillery informs the command and the air service relative to hostile aerial activity. It establishes an observation and communication system which enables it to give prompt warning to the air service and threatened elements of impending aerial attack.

The various means of antiaircraft artillery are combined in the regiment which includes gun battalions and machine-gun battalions. Gun battalions include gun and searchlight batteries.

CAVALRY.

79. Cavalry is characterized by a high degree of mobility and by a relatively reduced fire power in proportion to the means employed. Its special value is derived from its mobility and the rapidity with which its fire power can be displaced from one position or locality to another.

The characteristics of cavalry indicate the situations under which it can be most advantageously employed. It finds its most intensive application under conditions which permit the most complete freedom of maneuver and the exercise of the power of mobility. Its utility becomes limited as conditions are created tending to restrict freedom of maneuver; these conditions reduce the necessity for highly mobile organizations and create a correspondingly increased demand for those capable of developing a large volume of fire and of conducting a sustained action.

80. The mobility of cavalry enables it to operate on extended fronts and at considerable distances from the main friendly forces. It thus extends the scope of operations of large units and secures to them the necessary freedom of maneuver.

Cavalry executes the missions of reconnaissance, counterreconnaissance, and security in the service of large units and delivers combat in the execution of these missions and in combination with the operations of other elements of the large units to which it is assigned.

81. In its reconnoitering and covering operations, cavalry is employed to screen the movements of large units, to cover their concentration, and to execute detailed terrestrial reconnaissance. Its screening operations, as well as its reconnaissance, are generally most effective when the cavalry is employed as a mass to engage and defeat the hostile cavalry.

82. Cavalry constitutes a mobile fire element in the hands of higher commanders. It is especially adapted to combat missions requiring rapidity of attack and delaying action.

Rapidity of movement enables cavalry to take advantage of opportunities to strike a sudden blow at weak points in the hostile dispositions. It may thus be employed to attack hostile forces in process of concentration, to operate against exposed enemy flanks or rear, and to exploit by pursuit the successes obtained by other arms. Its rapidity of movement enables cavalry to meet critical situations arising in the course of operations.

The mobility of cavalry makes it an effective means of conducting delaying action over considerable fronts and depths. It is thus employed to cover gaps between widely separated forces, either on the march or in combat, to seize important lines in advance of the arrival of stronger friendly forces, and to hold positions protecting their flanks or covering their retirement.

83. The combat action of cavalry is adapted to taking best advantage of its mobile characteristics. Separation of the troops from their mounts by great distances is avoided. Development for action is, therefore, whenever practicable, executed in mounted formation. Small units may make a mounted attack when opposed to an inferior or demoralized enemy or when the attack can be delivered from close range by surprise.

Cavalry seeks to attain success through rapidity of attack and delaying action rather than through the sustained effort which is required of infantry. It therefore fights on a relatively broad front and slight depth. The greater part of the force is in the combat echelon and local reserves are reduced to a minimum.

Strong reserves are, on the other hand, often held out by the larger cavalry units. On the offensive, relatively weak forces, deployed in groups, contain the enemy on the front while the principal forces, attacking with rapidity and by surprise, strike the hostile forces in flank and rear. The holding out of reserves to support the frontal defensive groups by fire action or counterattack on the flanks is also usually the most effective form of cavalry defensive action. Similarly, in a withdrawal, reserves support the frontal elements by repeatedly striking the hostile pursuit in flank or by taking up successive positions with a view to the delivery of flanking fire.

84. The efficiency of cavalry depends in an especial measure upon the maintenance of the condition of the mounts. Adequate provision must be made for their rest and subsistence and the relief of detachments assigned to especially arduous duty. The strength of cavalry must not be so frittered away in secondary undertakings as to render it inadequate to the execution of its decisive missions.

The vulnerability of large mounted formations to aerial attack frequently imposes on cavalry the necessity for executing its movements by night or for breaking up march columns into small groups when marches are executed by day.

85. Cavalry is armed with the rifle, machine rifle, pistol, and saber. The larger cavalry units include machine guns, artillery pieces, and armored cars.

86. Cavalry is organized with a view to the relatively extended frontage and reduced depth of its dispositions. Its elementary unit of combat, corresponding to that of the infantry, is the squad. The strength of larger units, the platoon, the troop, squadron, regiment, and brigade, is relatively decreased in view of the reduced requirements of cavalry in respect to local reserves. The brigade includes a machine-gun squadron, elements of which are attached to smaller cavalry units for combat.

87. Cavalry is combined with other auxiliary arms in the cavalry division.

Cavalry does not constitute an organic element of corps or of infantry divisions. Cavalry elements are attached to these units from army cavalry as required by the situation.

Several cavalry divisions may be combined into a cavalry corps for the execution of a special mission. Large cavalry units are frequently reinforced by infantry in motor trucks. The attachment of infantry to cavalry units enables them to employ the infantry to meet situations to which cavalry characteristics are not especially suited and at the same time to assign the cavalry to tasks to which it is peculiarly adapted. The infantry may thus be employed for the frontal attack of an enemy in position while advantage is taken of the greater mobility of the cavalry off the roads to strike the enemy in flank or rear; similarly, infantry may be employed to hold a defensive position, releasing the cavalry for more mobile missions. The attachment of infantry to large cavalry units is always indicated in cases where the situation requires the frontal attack of hostile troops in position or the stubborn holding of a defensive position.

SIGNAL CORPS.

88. Signal troops are organizations of experts skilled in the installation and operation of the technical means of signal communication. They are immediate agencies of the command in the service of which they transmit and receive orders, reports, and other messages.

89. Telegraph and telephone lines constitute the basic means of signal communication. Other means of communication supplement and extend the service of the telegraph and telephone lines.

90. Signal corps troops construct and operate the axes of telegraphic and telephonic communication which constitute the framework of the communication system of the field forces. The control points of this framework are the message centers of the large units and the advanced message centers of the leading infantry divisions. The system of signal communications thus defined is known as the command system.

91. During an advance, each large unit establishes one or more axes of signal communication in the direction of its movement. Subordinate large units make connection at the head of the axial line established by the superior unit or at other exchanges on the axes of communication.

92. In principle, each arm of the service is responsible for the establishment of its own interior signal communications and for the connection of its message center with the axes of communication established by the signal corps. In deploying for combat, the component units of divisions establish this connection at the advanced message center of the division or at other exchanges on the axis of signal communications.

93. In combat, supporting artillery units establish the wire communication from their message centers to the message centers of the unit supported. Supporting and supported units are also mutually connected through their connections with the command system.

94. The signal corps exercises technical supervision over the entire signal service of the field forces. It supplies other branches with the technical apparatus required for the installation of their own system of signal communications.

Signal corps units operate the message centers of the command to which they pertain.

95. The organization of signal corps units is adapted both to their technical employment and to their distribution for the execution of their various missions. The signal corps troops assigned to divisions, corps, and armies comprise construction units designed for the installation of telegraphic and telephonic lines and operating units which include components for the operation of message centers, radio communications, and telegraph and telephone lines. In addition, signal corps troops assigned to armies include units designed for employment in connection with meteorological, intercept, radio-goniometric, listening, and carrier-pigeon service of the army.

ENGINEERS.

96. Engineer troops are essentially organizations of skilled labor designed to increase the combat capacity of other arms through the execution of work facilitating their movement, increasing their defensive powers, and providing for their shelter and water supply.

Engineers contribute to the mobility of armies by the maintenance of their routes of communication and the elimination of obstacles to their movement. They decrease the mobility of hostile forces by the execution of demolitions and the creation of obstacles. They increase the defensive powers of other arms by the construction of certain defensive works, by technical assistance to those arms in the construction of these works of defense, and by furnishing them with the necessary supplies and matériel for the execution of field fortifications. They assist in maintaining the efficiency of troops of all branches by making the necessary provisions for their shelter and water supply, together with the incidental installations (except signal communications).

97. The most important engineer mission is the construction, improvement, and maintenance of routes of communication and movement. Upon the successful execution of this mission depends, in large part, the mobility of the field forces and their power of maneuver. Broad prevision of the scope of operations, careful planning, and the timely supply of the necessary matériel and labor are essential preliminary measures. These measures must be supplemented by progressive reconnaissance continuing throughout the course of operations.

98. In principle, each combatant arm is responsible for the execution of the works necessary to its own defense. Engineer troops are employed for the construction of field fortifications of a special character and those essential to the general service of the command. They render technical assistance to other arms in the siting and construction of defenses and exercise such degree of supervision over the execution of field works as may be delegated to them by the command to which they are assigned or attached. When not required for the execution of tasks for which they are peculiarly responsible, they may be employed to reinforce the other arms in the construction of their defense works. The principal responsibility of engineers in connection with defenses constructed by other arms consists in the supply of the necessary engineer tools and matériel.

The siting and construction of rearward lines of defense, in accordance with instructions prepared by the command, may be delegated to engineer units.

99. Engineer troops are classified as general and special.

General engineer troops cover a wide field of engineering duties. These duties are, in general, in the nature of a pioneer service. General engineer troops include combat engineer regiments of infantry divisions, mounted combat engineer battalions of cavalry divisions, and general service engineer regiments and auxiliary engineer battalions of corps, armies, and the general headquarters reserve.

Special engineer troops perform engineering duties which require special technical training. They include topographical, camouflage, railway, and lumber battalions, bridge and water-tank trains, and shop companies. They are assigned to armies or to the G. H. Q. reserve. The needs of lower units for the services of special engineer troops are met by the attachment to corps and divisions of the necessary troops or by the execution of the work required under the direction of army headquarters.

100. Engineer troops are equipped with the necessary implements, transport and matériel for the execution of their duties. Combat engineer units are in addition armed with the same weapons as the infantry rifle company. All engineer units serving with armies and lower units are armed with the rifle

101. The elementary unit of organization of combat engineer units is the platoon, which is the smallest unit to which engineer equipment and the means for its transportation are regularly assigned. As a general rule, detachments smaller than a platoon should not be made. Larger combat engineer units comprise the company, battalion, and the regiment, so organized as to meet the general engineering needs of the unit to which they are organically assigned and to make available suitable groups for attachment to its component units. Engineer units are given the same degree of mobility as the units to which they are assigned.

102. Combat engineer units constitute an emergency infantry reserve of the unit to which they are organically assigned.

103. In principle, the engineers assigned to any large unit are responsible for such route improvement and construction, including bridging, as is necessary to facilitate the movement of the troops and transportation of the unit to which they are assigned. Work of a more permanent nature and construction required for the passage of heavier loads than the maximum included in the composition of the leading units is undertaken by the engineers of higher units in order that the advancing troops may not be deprived of the services of the engineers assigned to them.

AIR SERVICE.

104. Air forces are characterized by an extremely high degree of mobility, a power of movement in three dimensions, and extreme range of fire power.

Their mobility enables them to cover great distances in a short period of time and makes possible the rapid intervention of powerful aerial concentrations at critical points in the theater of operations.

The power of aircraft to move in vertical as well as horizontal directions enables them to maneuver in altitudes beyond the range of ground forces, to approach terrestrial objectives from such altitudes, and if uninjured again to withdraw themselves from the effective zone of ground fire. It also enables them to make deep incursions into enemy territory behind the lines of the hostile ground forces.

Aircraft have a range of fire equivalent to the distance which they are capable of covering as limited by their fuel capacity. They are thus enabled to attack objectives behind the enemy's lines and in enemy country beyond the extreme range of artillery, as well as those located within the range of ground forces.

The powers of aircraft are limited by their dependence on landing grounds and by atmospheric conditions.

105. The air service comprises aviation, balloon, and airship units. Aviation includes heavier-than-air craft; balloons and airships are lighter-than-air craft.

106. The missions of aviation units comprise combat, observation, and the transmission of information. Combat missions comprise the pursuit of hostile aircraft, the attack of hostile ground forces, and the bombardment of terrestrial objectives. Observation missions include distant, close, and battle reconnaissance and the transmission of the information secured through reconnaissance.

Corresponding to these missions, heavier-than-air craft is organized into observation, attack, pursuit, and bombardment units. Each of these classes of aviation units is equipped with types of airplanes, armament, and other equipment adapted to its mission.

The several classes of aviation are not restricted in their employment to the missions to which they are specialized. In varying degrees, all classes are qualified to execute the various aviation missions; their employment is governed by the relative importance of the several missions, the strength of the available air forces and the limitations imposed by the types of airplanes employed by each class. Incidental to the execution of its special missions, each class also executes missions to which others are specialized.

107. Observation airplanes usually operate either singly or in formations of two or three airplanes. Combat airplanes usually operate in formations.

108. Pursuit aviation constitutes the most vital element of the air service. Its success creates the conditions which enable the other elements to operate with the greatest degree of effectiveness.

The general mission of pursuit aviation is to establish and maintain aerial supremacy.

At the beginning of operations, pursuit aviation is concentrated for action against the zone concerning which the command most requires detailed information. Its activity is closely coordinated with that of observation aviation. Pursuit aviation furnishes the aggressive element of aerial reconnaissance in force.

In the attack of the combined arms, it is the mission of pursuit aviation to clear the air of hostile aircraft as far back as the line of the hostile artillery. It especially attacks airplanes and balloons engaged in the adjustment of hostile artillery fire. The execution of this mission usually requires it to operate in successive formations.

In battle, locally inferior pursuit forces seek to overcome their inferiority by concentrating their activity in point of time and thus defeat the hostile aviation in detail.

The action of pursuit aviation is essentially offensive. It affords most effective protection to the other air service units and to ground forces by seeking out and defeating the hostile aviation. When observation aviation requires local protection in the execution of reconnaissance missions, such protection is best secured by grouping several observation airplanes in formation.

Pursuit aviation and antiaircraft artillery cooperate closely in defense against the night operations of hostile aviation and in the antiaircraft defense of localities.

Pursuit airplanes are armed with machine guns; when employed as attack aviation, they also carry light bombs.

109. Observation aviation operates for the information of the higher command, the artillery, the infantry, and the air service. It executes missions of both distant and close reconnaissance, observes troop movements, road and railroad traffic, enemy aircraft, and other evidences of hostile activity, and carries out special surveillance missions. It reconnoiters artillery objectives, observes artillery fire, and assists in its adjustment. It maintains contact of the higher command and artillery with the advanced infantry units in battle and transmits to infantry commanders information relative to the enemy's advanced elements. It reconnoiters and reports objectives for bombardment and attack aviation.

The reconnaissance of observation aviation is carried out by both visual and photographic means.

Observation airplanes supplement the other means of communication between the command and the troops in action. Communication from the airplane to the ground is accomplished by means of radio telephony and telegraphy, dropped messages, pyrotechnics, and other visual signals. From the ground to the airplane the means employed are pyrotechnics, panels, and radio. In special cases, observation airplanes may be employed for the transmission of messages between widely separated commands when other means of communication are lacking or inadequate.

While engaged on reconnaissance missions, observation airplanes do not ordinarily seek combat; they fight only in self-defense. Insufficiency in the number of other types of airplanes or other factors of the situation may, however, require the use of observation airplanes for the attack of ground objectives.

110. The mission of attack aviation is the attack of ground troops. These comprise the advanced hostile infantry, the artillery, balloons, reserves, and supply columns, troop trains, and columns of troops on the march.

Attack units operate over considerable depth and extended frontage.

Attack airplanes are equipped with light cannon, machine guns, and light bombs.

Troops and transportation in close formation are especially susceptible to the action of attack aviation.

Concentrated employment of attack airplanes against objectives of decisive importance is essential to success.

111. The mission of bombardment aviation is the bombardment of ground objectives. It operates particularly against hostile territory beyond the effective range of artillery. It carries out bombing operations both by day and by night.

Objectives of particular importance to bombardment aviation are those vital to the functioning of the enemy's line of communications and supply (railways, railroad stations, important bridges, supply depots, airdromes, etc.). During decisive combat, its effort is concentrated to render the greatest assistance possible to the main attack.

112. The elementary unit of combat aviation is the flight, which comprises the largest number of airplanes that can be effectively maneuvered under the immediate control of a single leader. The basic unit of aviation is the squadron which combines several flights and units necessary to their maintenance, supply, transportation, and signal communication. Higher aviation units are the group and the wing.

Larger combined formations of pursuit and bombardment units are constituted for the execution of special missions under the direction of general headquarters.

113. The assignment of aviation elements to large units is based upon their mission and radius of action.

Observation units are assigned to divisions, corps, armies, and the G. H. Q. reserve.

Pursuit and attack units are assigned to armies and the G. H. Q. reserve.

Bombardment units and airships are assigned to the G. H. Q. reserve.

The assignment of aviation elements to particular units is to be regarded as flexible. It does not imply their fixed attachment to such units. The necessity for effecting aerial concentrations on critical fronts will frequently lead to the detachment of aviation elements from the units to which they are assigned. During phases of operations when the possibility of contact with hostile ground forces is relatively remote, the missions assigned to corps and divisions do not require the assistance of air forces; during such phases, the aviation units are concentrated under the control of higher commanders.

Aviation units assigned to the G. H. Q. reserve may operate directly under general headquarters or they may be placed at the disposition of army or army-group commanders for a particular operation.

114. Captive balloons constitute elevated observation posts and serve as a means of extending the field of view under continuous observation. They are capable of ascending to a maximum height of 4,500 feet, of obtaining a field of view under favorable conditions extending over a distance of 20 miles, and of communicating the results of their observations by telephone to the ground. They possess a considerable degree of mobility and can be moved frequently without material loss of efficiency.

Captive balloons observe developments in friendly and in hostile territory for the information of the command, the artillery, and the infantry. For the purpose of observing and adjusting artillery fire, they are, whenever practicable, employed in preference to the airplane as a means of supplementing ground observation. The airplane is preferably reserved for the observation of targets which are either located in territory beyond the effective field of view of observation posts and balloons or are defiladed from their view.

Captive balloons also serve as means of communication between the command and advanced infantry elements.

The captive balloon constitutes a vulnerable objective for the attack of hostile aviation. Balloon units are armed with machine guns and light cannon for antiaircraft defense.

The basic balloon unit is the company which is equipped with one balloon and the ground installations necessary to its operations. Higher units are the balloon group and the balloon wing.

Balloon units are assigned to corps and the G. H. Q. reserve. For operations, corps balloons are allotted to infantry divisions and the corps artillery. Balloon units of the G. H. Q. reserve serve as a source of reinforcement and replacement for corps balloon units.

115. Airships are capable of long sustained flights and have considerable lifting power. They are employed on special distant missions and as an emergency means of transport.

CHAPTER V.

INFORMATION.

RESEARCH OF INFORMATION.

116. Military information is essential to the efficient preparation and execution of strategical and tactical plans. It constitutes a vital element in the commander's estimate of the situation and decision. Continuous research of information by all available means throughout the course of operations is necessary to the successful operations of all units.

117. On the outbreak of hostilities, the commander of the field forces is furnished with the information collected by the War Department General Staff in time of peace relative to the terrain and resources of actual or probable theaters of operations, the enemy's military forces, his resources in man power and matériel, his war aims and interests, and political, economic, and other data bearing on his ability to wage war. This is supplemented by additional data collected by the War Department General Staff and the general headquarters of the field forces during the progress of the war.

118. In the theater or theaters of operations each unit is charged with the execution of the necessary measures for the collection of military information within its own zone of operation. The information obtained by subordinate units relative to their own zones of operation is supplemented by superior units and general headquarters through the employment of the special means at their disposal.

Information collected by combat units in the field relates chiefly to the enemy forces with which they are in contact. It bears on their location, strength, composition, movements, intentions, armament, equipment, supply, tactical methods, discipline, morale, and general and special situations.

119. The sources of information in the field include aerial and terrestrial observation and reconnaissance (visual or photographic); enemy documents (orders, reports, plans, maps, letters, etc.); higher subordinate and adjacent units; prisoners of war, deserters, repatriates, and inhabitants; escaped or exchanged prisoners; captured enemy matériel; radio intercepts and goniometry; listening in on hostile telegraphic and telephonic communications; sound and flash ranging; enemy and neutral press; espionage.

120. The necessary orientation is given to the research of information by the issuance of instructions to subordinate units indicating the points of greatest importance to the execution of the commander's plan of operations and to the security of the command. These instructions are more or less specific, depending upon the situation and the size of the command. In some cases they may be limited to a statement of the general object to be accomplished. In other cases instructions may be elaborated into a systematic plan of intelligence research.

Each unit commander, in his own zone of operation, directs the research of information in accordance with instructions received, and in addition independently carries out such researches as are dictated by his special situation or required for the execution of the operation in which he is engaged.

121. The evaluation, collation, and analysis of military information is the duty of the intelligence division of the general staff of large units and of the intelligence agencies of brigades, regiments, and battalions.

Information received by each unit is collated and transmitted to higher and adjacent units either in the form of situation reports or of periodic summaries. Important items of information are transmitted immediately. Situation maps are maintained by each headquarters showing the location of each of its elements, adjacent units, and the enemy. Information reports are evaluated in the light of other reports received, the reliability of the source, and other known factors of the situation. Special measures may be necessary to secure confirmation of doubtful information. Reports received during combat are often subject to discount on account of their exaggerated character. Situation reports are, when practicable and pertinent, accompanied by sketches. Information that no change in the situation of a subordinate unit has taken place and information confirming reports already rendered are frequently of importance to the commander. Such information is periodically reported during combat.

Analysis of the information received leads to a more or less complete reconstruction of the enemy's situation and activities and frequently furnishes the best indication of his intentions.

122. Negative information (e. g., that a certain locality was not occupied by the enemy at a certain time) is frequently important. First contact with the enemy is always reported.

123. Reports always give the source of information. Distinction is made between what is known and what is inferred. Reasons for inferences are given. Accurate statements as to time, place, and numbers are required. Indefinite expressions are avoided.

124. Delay in the transmission of information decreases its value. It may lose all value if it reaches the commander too late to permit him to take the required action. It is therefore frequently necessary to transmit promptly incomplete items of information without waiting for more definite developments.

COUNTERINFORMATION.

125. The success of the operations of the field forces and the security of the command depend to a large extent upon the effectiveness of the measures taken to prevent the enemy from gaining information relative to their dispositions, movements, and plans. Possession by the enemy of information of our own forces gives him time to take the necessary countermeasures, enables him to direct the employment of his forces to the greatest advantage, and destroys the effect of surprise essential to the success of our own operations.

Counterinformation measures comprise counterespionage, censorship, counterreconnaissance, night movements, the use of covered approaches, camouflage, smoke screens, the enforcement of secrecy discipline, and the observance of secrecy measures in the preparation of plans of operation.

The intelligence agencies of the several units control the counterespionage service and censorship in the theater of operations. In hostile territory the movements of inhabitants are strictly controlled; possession is promptly taken of telegraphic and telephonic establishments and other means of communication; newspapers and postal communications are suppressed or are censored with reference to the publication of information relative to our own forces.

For regulations relative to censorship, see Chapter IV, Part II.

Counterreconnaissance is executed by the air service, the cavalry, and security detachments.

Counterreconnaissance can not be relied upon for complete protection from enemy observation. It must be supplemented by other measures, including night marches, concealment of day location of forces in woods, villages, and other cover, the use of masks, camouflage, and smoke.

Secrecy discipline requires that troops refrain from discussing the military situation, plans, movements, etc., in the presence of civilians. The use of the technical means of signal communication is closely supervised with a view to enforcing the regulations relative to the transmission of secret information and instructions.

Special precautions are taken in the preparation of plans of operations to avoid their premature disclosure. In the various phases of their development only so much is communicated to subordinates as is necessary to the efficient execution of the missions assigned to them. For reasons both of secrecy and of simplicity in the statement of missions, it is generally undesirable that the operation orders of any unit reproduce in their entirety the provisions of the orders of superior units. Special precautions are taken in the safeguarding and transmission of secret and confidential documents.

Counterinformation is supplemented by measures designed to deceive or mislead the enemy as to our intentions and dispositions. (See par. 382.)

CHAPTER VI.

TRANSMISSION OF ORDERS, INFORMATION, AND REPORTS—DIARY.

GENERAL PRINCIPLES.

126. The efficient exercise of command and the prompt exploitation of information require the establishment of reliable means of communication.

127. In principle, orders, information, and reports are transmitted through military channels. When in urgent cases deviation from this principle occurs, intermediate commanders are informed as soon as practicable as to the purport of orders or other messages delivered directly to their subordinates.

128. Communication is effected by technical means and by messengers. Connection is maintained between superior and subordinate units and between adjacent units. The establishment of communication by technical means between subordinate and superior units is the responsibility of the superior unit; between adjacent units, as directed by their common superior. Each unit makes its own provisions for transmission by messenger.

129. Due economy in the employment of the technical means of signal communication must be practiced. Signal units and their matériel are not committed to action until a situation develops which warrants the expenditure of the matériel and effort involved. Economy of force must also be considered in the selection of the means employed; the various means of signal communication are so employed that they mutually supplement each other and that those requiring the greatest expenditure of effort and matériel are not put into action when the service required can be effectively performed by the less expensive means.

So long as headquarters are in movement they usually maintain connection by means of mounted messengers, motorcyclists, and cyclists.

130. The location of the various command posts constitutes the basis for the employment of signal units; the early designation of command posts on deployment for action is necessary for the prompt establishment of signal communications. In the location of command posts, consideration is given to the requirements of signal communications; cover from hostile ground and aerial observation is necessary to the undisturbed functioning of radio and projector stations.

131. In accordance with the directions of the commander, the signal officer of each unit prepares the instructions for the establishment of the signal communications of the units. These instructions contain the necessary information to enable the signal officers of subordinate units to take the necessary measures for the establishment of signal communications within their units and the connection with the axes of communication or message centers of the higher units (location of the axes of signal communication, message centers, exchanges, employment of signal troops and the various means of signal communication, etc.). Signal officers of the combatant arms maintain close touch with the divisional signal officer.

MESSAGE CENTERS.

132. The signal officer of each unit down to and including the battalion establishes and operates a message center, which is charged with the dispatch, recording, and coding and decoding of messages. The message center determines what means of transmission will be used and is responsible for the prompt delivery

and the acknowledgment and receipt of messages. It determines the priority in the dispatch of messages in accordance with the instructions of the commander.

133. Advanced message centers are usually established at the head of axes of signal communications. They serve as junction points for the connection of the telephonic systems of subordinate units with the axes of signal communications and for the reception and relay of communications transmitted by messengers. They are usually equipped with the various technical means of signal communications as well as an adequate messenger service. When signal communications are lacking or fail to function, the advanced message center serves as a means of economizing the number of men employed in the transmission of messages and increases rapidity and certainty in transmission.

Advanced message centers should be easy to find and are, therefore, preferably located on or near the main routes of traffic. They should, as far as practicable, be protected from hostile fire. Information as to their location is always transmitted to the troops.

During an offensive operation, construction of telephone lines is pushed forward from the advanced message center in accordance with the progression of the troops and new advanced message centers established as required by the situation.

When division headquarters moves forward by echelon, it will be advantageous, if consistent with other considerations, for the first echelon to select the new command post in the vicinity of the advanced message center. When the movement of headquarters is completed, the advanced message center will then become the division message center.

Advanced message centers are frequently employed in the reconnaissance operations of cavalry divisions as collecting points for messages of several reconnaissance detachments. (See pars. 184–189.)

TRANSMISSION BY TECHNICAL MEANS.

134. The technical means employed in the transmission of messages include the telephone, telegraph, radio, signal tanks, airplanes, ground telegraphy, visual and sound signals, carrier pigeons, message grenades, and messenger dogs.

135. The telegraph and telephone constitute the basic means of signal communication. They will not, however, always be available for communication between forces operating at a considerable distance from each other, between troop units and the higher command on the march, and between the advanced troops and the rear in combat. Rapidly changing situations such as a pursuit or retreat greatly restrict the practicability of their employment. Their failure to function in critical situations must also be reckoned with. They must, therefore, be supplemented by other means of communication.

Telephonic and telegraphic transmission is subject to hostile interception. It should not be employed in interchanges relative to plans of operation which are not to be immediately executed. Code language is frequently prescribed for use in telephonic interchanges subject to enemy interception.

During an advance, signal troops engaged in the construction of axes of telephonic communication usually operate in two detachments. The rear detachment starts at the head of the line already completed, while the leading detachment commences construction at an advanced point along the route of movement. When the rear detachment has reached the point where the section under construction by the leading detachment commences, it moves past the leading detachment and recommences construction at an advanced point; detachments thus successively pass each other on completing the construction of sections of the line.

136. Radio transmission is especially applicable to employment in spanning distances between widely separated forces. It also possesses the advantage of being less vulnerable than wire systems to the effects of hostile fire, and is, therefore, a valuable supplement to wire lines in combat. Signal tanks equipped with radio are especially suited to employment in zones of heavy hostile fire. Radio permits of the simultaneous transmission of a message to several recipients. Interception of radio messages must, however, be presumed; code is therefore used for the transmission of all messages which contain information of value to the enemy. Discretion must be used even in the sending of coded messages, on account of the possibility of their being deciphered by the enemy; where radio is the only adequate means of communication available, it may be necessary to decide whether the urgency of the message outweighs the value to the enemy of information contained in it. Radio transmission is also subject to hostile interference.

Signal detachments charged with maintaining radio communication during the progress of a march usually work in pairs and advance by successive bounds; one detachment establishes and operates a radio station while the other moves forward to an advanced position. When the rear detachment discontinues its station, it passes the station of the leading detachment and reestablishes its station in an advanced position.

137. Airplanes find especial application as a means of communication when distance, intervening obstacles on the ground, or other factors of the situation prevent the use of other means, or when more rapid transmission is required than can be accomplished by other available means. They are thus used to span gaps between widely separated forces, between the command and the infantry, and the artillery and the infantry in combat, and between the command and various elements of columns on the march. In combat, dropping grounds are established near the command posts of large units, and infantry and artillery commanders; on the march, near the location of higher commanders and at various points along the route of march. Dropping grounds are identified by the display of panels.

138. Signal projectors are the principal means for transmitting messages by visual signaling. They find especial application under circumstances where the necessity for economizing matériel renders impracticable the establishment of wire connections. They are thus employed for communication between infantry units and the rear on development for action prior to the establishment of wire lines; between adjacent units; between reconnaissance and security detachments or patrols and the rear; between infantry companies and their battalions in action; and between observers in the combat echelon and the rear. They are also employed to supplement wire lines and as a means of communication between airplanes and ground troops.

The use of signal projectors is limited by the consideration that the light flashes must be concealed from hostile observation. The discovery of their location draws hostile fire and may give the enemy information as to the distribution of the troops. Their utility is, therefore, for the most part, limited to communication from front to rear. Connection by projector from rear to front may sometimes be effected through the employment of relays of oblique lines.

Communication by projector is usually limited to short conventional messages.

Communication by signal flags is similar in application to projector signaling but is more restricted in scope.

Light signals (rockets, flares, etc.) are one of the most efficient means of communication between the infantry and the artillery in battle and of transmitting to the command information of the arrival of the leading battalions at important terrain lines or points. Light signals of the leading units are, when necessary, repeated by message centers of the higher unit to which they pertain.

139. Ground telegraphy has the advantage of relative invulnerability to fire effect, but its radius of transmission is limited. It finds its most useful application in spanning short distances over fire-swept zones in combat.

140. Sound signals are chiefly of value as alarm signals, as a means of attracting attention, and for the transmission of short conventional messages and orders.

141. Message grenades, messenger dogs, and carrier pigeons find their principal application as a means of communication from the combat echelon to the rear.

TRANSMISSION BY MESSENGER.

142. Sole reliance can not be placed upon the technical means of signal communication, and their absence or failure to function does not relieve a commander of his responsibility of keeping superiors and adjacent units informed as to the situation. Independently of the technical means, each commander provides for the transmission of orders, information, and reports by means of messengers.

143. In transmission by messengers, the most efficient means of movement available is employed. Depending on the situation, the state of the roads, and traffic conditions, messengers are transported by automobiles, motorcycles, bicycles, or horses, or the message is sent by runner. In hostile territory it may be advantageous to use armored cars or to provide an armed escort.

144. In combat, communication by mounted messengers, motorcyclists, or cyclists is maintained as far forward as the hostile fire and the nature of the terrain will permit. Runners complete the transmission between the message center where service by mounted messenger, motorcyclists, or cyclists ceases and the more advanced units. Runners may operate singly or in relays of runner posts. The latter method is necessary when heavily shelled areas must be crossed and the greatest possible rapidity of movement is required. Runner relays between the message center of a unit and lower units are established by the higher unit.

145. For covering long distances, e. g., in connection with the reconnoitering operations of cavalry divisions, relay lines of mounted men may become necessary. When such lines are established, connecting posts are generally placed on the roads at well-marked points such as crossroads, bridges, etc.

146. Important messages are often sent by two or more messengers. It may be advisable to send duplicate messages by different routes. Officers are employed for the transmission of important messages when explanation relative to the situation or additional information may be required.

147. When several copies of a message are transmitted, notation is made on each copy as to the persons to whom copies have been furnished.

148. Messages carried by messenger are, when practicable, inclosed in envelopes properly addressed. The envelope, when not marked "confidential," is left unsealed so that commanders along the route of transmission may read the contents. The recipient notes the time of receipt upon the envelope and returns it to the bearer. Other persons to whom the message is shown en route enter notation over their signature on the message.

149. The officer directing the transmission of a message gives the messenger the instructions necessary to the accomplishment of his mission (destination, route, rate of movement, persons along the route to whom the message is to be shown, place where he is to report after the delivery of the message). Unless considerations of secrecy prevent the messenger is informed as to the contents of the message

DIARY.

150. The diary is a record of events kept during actual or threatened hostilities by troops in the theater thereof and during maneuvers by the troops engaged therein. Detailed instructions as to the preparation and disposition of the diary, data to be entered therein, and units by which kept are contained in Army Regulations.

CHAPTER VII.

RECONNAISSANCE.

GENERAL PRINCIPLES.

151. Reconnaissance is the operation carried out by troops in the field for the purpose of gaining information relative to the enemy or the terrain and resources of the theater of operations.

152. Reconnaissance is executed in conformity with the principle that contact with the enemy must be gained at the earliest practicable moment and once gained is never lost.

153. According to the location of objectives and the phase of operations in progress, reconnaissance is classified as distant, close, and battle reconnaissance.

154. Distant reconnaissance is directed against distant objectives. It procures the information upon which the strategical and operative plans and decisions of the high command are based. It commences during the opening phases of campaign and continues throughout the subsequent course of operations. It seeks to determine the enemy areas of concentration and the strength, general composition, routes and direction of movement of hostile columns; the progress, depth, and width of the movement; the location and configuration of the enemy's dispositions and his defensive organization; the location and strength of his general reserves; railroad traffic and construction behind the enemy's lines; location of supply establishments, airdromes, etc.

During the opening phases of campaign, distant reconnaissance is directed against objectives well within hostile territory. As the principal opposing forces approach contact, its activities are directed against distant objectives in rear of the leading hostile elements, in enemy territory, and on the flanks of the hostile forces.

155. Distant reconnaissance is a mission of the air service and the cavalry. The rôle performed by each of these two arms in the execution of this mission is determined by its peculiar characteristics. The air service seeks to locate the principal hostile concentrations, the routes of movement of the main hostile columns, and activity within the hostile lines. Cavalry locates advanced enemy elements by contact; by combat, it pushes home the contact thus established, secures touch with more important advanced enemy forces, and locates gaps in the hostile front of operations. It thus establishes the configuration of the hostile dispositions. Its reconnaissance continues under weather conditions that impede air operations and against objectives that are concealed from air observation. Cavalry furnishes the most reliable negative information (e. g., that a certain area or locality is not occupied by hostile forces). It obtains information by questioning prisoners, deserters, and inhabitants, and by the seizure of posts and telegraph offices and the examination of letters, dispatches, and newspapers. It executes the detailed terrain reconnaissance essential to the operations of the field forces. On the other hand, cavalry can rarely secure information relative to activity within the hostile lines, and its action in obtaining and transmitting information is much less rapid than that of the air service.

Information obtained by the air service enables higher commanders to give the proper orientation to the reconnaissance activities of cavalry.

156. Measures for the coordination of the distant reconnaissances of the air service and the cavalry are of especial importance in the opening phase of campaign. For this purpose, general headquarters establishes an advanced center of information near the headquarters of the cavalry command under charge of a superior officer. Similar measures may be taken by groups of armies or an army for the coordination of the reconnaissance activities of the air service and cavalry operating under their orders.

157. Close reconnaissance is executed when the opposing forces are within a few days' march of each other. It furnishes the command with the detailed information which serves as the basis for tactical decisions. It seeks to determine, e. g., the location of advanced enemy forces; the strength and composition of the hostile columns; his local defensive organization; supply arrangements; detraining points, etc.

Close reconnaissance is executed by the air service and the cavalry in the service of large units and by each arm in connection with its own operations.

158. Battle reconnaissance includes the continuous observation of the activity of all enemy forces engaged in battle or in immediate contact with our own principal forces preliminary to battle. It furnishes commanders of all grades with information necessary to the most effective employment of the forces which have not been committed to action. It aims chiefly to secure information relative to the enemy's tactical dispositions. It comprises the observation of the activities of the enemy's advanced elements, the location and movement of his reserves, the location of his flanks, the deployment of his artillery, etc. Battle reconnaissance is executed by all combatant arms. The activities of cavalry are ordinarily restricted to the flanks. Flank reconnaissance is of especial importance during battle.

159. Reconnaissance is executed by forces varying in strength from a large unit composed of all arms to a patrol of a few men.

160. Essential information can frequently be secured only through attack. Reconnaissance forces do not hesitate to attack when their mission requires it.

161. Commanders regulate the execution of reconnaissance with a view to preventing duplication of effort as between the reconnaissance agencies under their own control and those of subordinate units and as between adjacent subordinate units. This object may be accomplished by the assignment of zones of reconnaissance in depth and in width, by the assignment of reconnaissance objectives or missions, or by informing subordinates relative to reconnaissances to be executed by higher units. In the absence of instructions, each unit executes the reconnaissances necessary to its own operations within its own zone of operations and toward unsupported flanks.

Due economy of forces is observed in the assignment of reconnaissance missions. Effective reconnaissance requires the concentration of reconnaissance forces against the objectives of most decisive importance.

162. Instructions for the execution of a reconnaissance cover information relative to the enemy which will assist the reconnoitering force in its operations and enable it to discriminate as to the importance of information obtained and the necessity for its prompt transmission; the zones, routes, or objectives of adjacent reconnaissances; the intentions of the commander in so far as these are of importance to the reconnoitering force; mission expressed in terms of the information required, including negative information when desired; relative importance of the various items of information required; the area to be covered, or route to be followed; and other data depending on the character of the reconnoitering force, the mission, and the situation.

163. The successful action of reconnaissance forces contributes strongly to the defeat of hostile reconnaissance on the front of reconnaissance. After the

reconnaissance needs on the front where the command most desires information have been provided for, forces are, when available, assigned to counterreconnaissance missions on fronts where it is of especial importance to screen the dispositions of the troops from hostile investigation.

AERIAL RECONNAISSANCE.

164. The air service participates in all phases of distant, close, and battle reconnaissance.

165. Aerial reconnaissance is executed by the observation squadrons and balloon units operating under the direction of the several large units. Pursuit units open the way when necessary for action of the observation airplanes.

166. The aerial reconnaissance missions of the several large units correspond to the objectives which are of especial importance to their decisions and dispositions; these missions vary with the distance separating the opposing forces.

Distant reconnaissance is the mission of the observation squadrons operating under the direction of general headquarters, a group of armies, or an army. Corps and division air service execute missions of close reconnaissance. Battle reconnaissance is ordinarily executed by divisional observation squadrons. Special close and battle reconnaissances are executed by the air service of corps and larger units for the information of the command (command reconnaissances).

167. Definite missions are assigned for the reconnaissance or observation units. Such missions may be the observation of certain zones or areas or the surveillance of important lines (e. g., rivers, railroads).

On a march in proximity to the enemy, the reconnaissance of the leading corps and divisions usually extends to a distance beyond their objective at least equal to the distance of their rearmost infantry units to the objective.

168. During the opening phase of operations, the necessary coordination between pursuit and observation units is insured by their common control by the same higher headquarters (general headquarters or groups of armies). During periods of active close and battle reconnaissance, it will usually be essential to decentralize the control of the greater part of pursuit units to the armies engaged in decisive operations in order that the action of pursuit may be effectively directed in support of the reconnaissances of corps and divisional air service. Large units having pursuit formations under their control inform subordinate commands as to the projected pursuit activity in order that the observation squadrons of the latter may coordinate their action with that of pursuit.

169. Deep reconnaissances into hostile territory are executed by observation units operating under the direction of general headquarters or of a group of armies. Such reconnaissances are frequently carried out by single airplanes flying at high altitudes. Several observation airplanes may be grouped for the execution of the reconnaissance when greater fighting power is required. Ordinarily the airplanes assigned to long-distance reconnaissances do not require the immediate protection of pursuit during the entire course of the reconnaissance. Hostile aerial activity may, however, make it necessary to provide escort of pursuit formations when crossing the enemy lines or other zones of especial danger. Considerations of conservation of the matériel and the necessity for the concentrated employment of pursuit forces require that their use in the protection of long-distance reconnaissances be closely limited.

Long-distance reconnaissances seek especially to discover indications of the enemy plan of concentration, troop movements between the interior and the front, and the shifting of troops from one theater of operations to another. Important railroad centers are kept under observation with a view to noting the volume and direction of traffic emanating from them. Concentrations of rolling stock fre-

quently furnish indications of projected troop movements. When important railroad movements are discovered, the routes of movement are held under constant surveillance, and effort is made to locate the detraining points of the hostile movement. Points of detrainment are frequently indicated by increase in detraining facilities at railroad stations.

Long-distance reconnaissances also indicate suitable objectives for the attack of bombardment aviation.

High-flying airplanes will not be able to follow the movements of troops on the ground. Railroad movements and extensive new constructions can, however, be readily observed. Aerial photographs will show new building, road, and railroad construction.

170. More detailed information will be required at points of decisive importance nearer the probable or actual zone of contact of the ground forces. It will be necessary for the reconnoitering airplanes to fly at lower altitudes, and stronger hostile opposition will be encountered. These reconnaissances are in daylight executed by observation squadrons operating in close cooperation with pursuit formations. Night reconnaissances may be executed by single airplanes. Roads and the exits to villages and woods are closely observed both by day and by night with a view to discovering the location of enemy forces and the direction of their movement. Columns once observed in movement are, as far as practicable, maintained under constant surveillance. On clear nights the movement of troops on roads in open country can be clearly distinguished; night reconnaissances are facilitated by the use of flares. Important information may be obtained by night observation of railroad centers and railway movements.

171. The battle reconnaissance missions comprise artillery missions, infantry missions, and command missions.

Observation airplanes assigned to artillery missions operate under the direction of the artillery commander. In accordance with his instructions, they execute the reconnaissances required for the location of artillery targets and adjust artillery fire. They report artillery fire effect, the appearance of new targets, and active enemy elements not being fired on. Observation of artillery fire is sometimes executed by formations of several reconnaissance airplanes in which one is charged with the actual observation while the others afford it the necessary protection from hostile attack.

Infantry missions include the observation of advanced hostile infantry and our own infantry, and the transmission of information and reports between the higher command and the artillery and infantry commanders and advanced infantry elements. Airplanes detailed on infantry missions observe the progress of combat and report the location of our own advanced infantry, the assembly of hostile troops for attack or of hostile reserves for counterattack, the location of hostile strong points holding up our own attack, location of hostile observation posts and enemy penetrations into our own position. Infantry airplanes identify themselves to our own infantry by firing rockets or flares or by other preconcerted means. The most advanced infantry elements identify themselves to the airplane by the display of panels, flares, flashlights, signal projectors, or other prescribed means. Infantry command posts identify their location by similar means.

Command reconnaissances are executed for the especial information of higher commanders. They may be ordered for the purpose of obtaining information as to the situation of the troops engaged or as to movements of hostile troops in rear or on the flanks of the battle front. Observation of hostile detraining stations is of especial importance.

172. In the assignment of reconnaissance missions, consideration is given to the number of missions that can be effectively executed with the air service strength available under the existing air situation. Where probability of combat with

enemy pursuit is high, it will be frequently necessary to send out formations to do the work which might otherwise be assigned to one airplane, with a consequent reduction in number of practicable missions.

The methods to be employed in the execution of the reconnaissance are normally left to the decision of the air service commander.

173. In deliberately prepared attacks it will often be important to avoid betraying the imminence and locality of the projected attack by unusual aerial activity. In such cases, it will be necessary to execute the required reconnaissances in connection with the normal aerial activity along the front of attack or to equalize increased aerial activity by a correspondingly increased activity on other fronts.

174. After provision for our own reconnaissance, any available pursuit may be employed for counterreconnaissance on fronts where it is important to conceal our own activity from enemy observation. During the battle of the combined arms, pursuit seeks to defeat hostile aerial reconnaissance by the attack of hostile observation airplanes and balloons. Bombardment and attack aviation contribute to counterreconnaissance by the attack of hostile airdromes.

Due to the inability of our own airplanes to remain constantly in the air, complete elimination of hostile aerial reconnaissance can not be expected; ground forces must in any case take the necessary measures to conceal their movements and dispositions.

TERRESTRIAL RECONNAISSANCE.

175. **General principles.**—Cavalry is the principal agency of terrestrial distant and close reconnaissance.

176. Forces charged primarily with the execution of reconnaissance missions regulate their activity with regard to their mission and the movements and activity of the enemy rather than with reference to the unit in the service of which they operate. Their distance from their own unit is limited only by considerations of the time required for the transmission of information by the available means and their own requirements for support. A unit assigned to a reconnaissance mission generally details separate forces for the execution of reconnaissance and its own security.

177. Forces assigned to reconnaissance missions secure information chiefly through the employment of patrols. When, on account of hostile activity or the distance of objectives, patrols require close support in the execution of their mission, reconnaissance is executed by detachments which closely back up the action of patrols and furnish reliefs for patrol duty.

178. The strength of reconnaissance detachments and patrols is influenced by the mission, the distance, the attitude of inhabitants, the strength and activity of the enemy, and, in the case of patrols, the necessity for concealment and their requirements for messenger service.

The more important distant patrols are commanded by officers. Intelligence personnel frequently accompanies reconnaissance patrols and, in especial cases, furnishes the personnel of the patrol.

179. Patrols are assigned clear missions and definite objectives. The ability of patrols sent out from a marching command to move in a lateral direction is limited and missions involving extensive lateral movement should not, as a rule, be assigned to them.

180. Patrols move by bounds from one observation point to another; successive locations and the route thereto are, as far as practicable, reconnoitered before leaving the previous location. When not in movement, patrols seek concealment. They utilize existing cover in their movement from one location to another. They attack when necessary to the execution of their mission. In hostile territory they avoid inhabited places. In order to reconnoiter the hostile main body, they endeavor to steal through the enemy's covering forces without being seen.

181. Reconnaissance in force sometimes constitutes the best means of clearing up an uncertain situation. This is especially the case when the enemy's covering forces deny the information to smaller detachments. For the troops engaged in the operation, reconnaissance in force usually consists of a local attack with a limited objective. The commander ordering a reconnaissance in force must give consideration to the possibility that his own intentions may thereby be revealed. He must also be prepared for the eventuality that the reconnaissance may bring on a general engagement.

182. Reconnaissance by cavalry.—Distant terrestrial reconnaissance is executed by cavalry divisions or lesser cavalry forces, operating under the direction of armies, a group of armies, or general headquarters. When several cavalry divisions have a common mission, they are usually combined under one commander.

183. The major mission of the cavalry engaged in distant reconnaissance is to gain and maintain contact with the enemy's principal forces, particularly in that part of the theater of operations of decisive importance to the success of the field forces. For the execution of this mission, it must have sufficient strength and fighting power to overcome the opposition of the hostile cavalry. In order to have sufficient cavalry strength at the critical points, it may be necessary to allot only minor cavalry forces to secondary fronts and to assign them a covering mission.

184. The cavalry division is assigned a zone of reconnaissance which ordinarily does not exceed 25 to 30 miles in width. It redistributes its zone to reconnaissance detachments varying in strength and composition in accordance with the hostile opposition to be expected and the relative importance of their several missions. Reconnaissance detachments may thus have a strength varying from a troop to a regiment, reinforced in accordance with the requirements of their mission by machine guns, armored cars, and artillery.

In the distribution of forces for reconnaissance and the assignment of missions, due consideration is given to the points of most decisive importance to the mission of the division. Greater strength and a more aggressive mission are assigned to the detachments operating in the more decisive zones. In the beginning when the situation is not clear, it will generally be advisable to limit the strength of reconnaissance detachments. In any case, the allotment of too large a proportion of the divisional strength to reconnaissance results in inadequate support of the reconnaissance detachments and reduces the power of the division to engage the main forces of the opposing cavalry.

185. The distribution of zones to reconnaissance detachments is based, in general, on the available road net. The zone assigned to a troop rarely exceeds 10 miles in width. In the case of flank zones, the inner boundary only may be indicated.

186. The cavalry division indicates the general route of the reconnaissance detachment within its zone of action and the line that its patrols are to reach daily. The distance between the reconnaissance detachment and the cavalry division varies in accordance with the situation; at times, it may become several days' march.

187. The reconnaissance detachment communicates with the main body by radio, messengers, or other available means. Messenger transmission may be effected by motorcycles, armored cars, or relays of mounted messengers. In hostile territory, especial provision for the protection of relay stations may become necessary.

188. The reconnaissance detachment provides for its security by day and by night. Change of location after dark adds greatly to security.

189. Reconnaissance detachments send out smaller groups in their front. Patrols constitute the leading reconnoitering elements. The reconnaissance detachment keeps its patrols well in hand at such distance that it can effectively support their action. This is accomplished in part by regulated advances and by the assignment of close objectives and definite missions. The reconnaissance detachment supports by attack the action of patrols held up by stronger hostile forces.

Patrols sent to distant objectives often have difficulty in sending back information; distant patrols are sent out only for the execution of important special missions. They are usually commanded by officers.

190. The cavalry division details the necessary covering forces for its own security. Reconnaissance detachments are not charged with missions of security with respect to the main body.

191. An observation squadron of the air service is assigned to each cavalry division. Its primary mission is to extend in depth the zone under observation by the reconnaissance detachments and to secure information which will enable the cavalry units to give effective direction to their activities. It assists the division commander in regulating the advance of the division by reporting the location of the various elements of his command and by the service which it renders as a means of communication between the division and its advanced units.

192. Reconnaissance detachments which have established contact with the main enemy forces keep them under surveillance through their patrols and follow the enemy's movements. They take advantage of the discovery of gaps between enemy elements to penetrate within the enemy lines, explore the gap, and reconnoiter the enemy's dispositions.

193. When the distance between the main bodies of the two opposing forces is so reduced that there is no longer room for its operations (two to three days' march), the cavalry division withdraws, in the general case, to a flank. The reconnaissance detachments either come under control of the corps or are relieved by elements of corps or divisional cavalry and join the cavalry division.

194. Cavalry attached to corps from army cavalry is employed in the execution of the various missions required by the situation. According to circumstances, it operates under the immediate direction of the corps commander or is distributed to the leading infantry divisions.

On account of the close connection between its operations and those of the leading infantry divisions, cavalry assigned to missions of close reconnaissance is usually most effectively employed under the direction of the infantry divisions.

195. Divisional cavalry engaged in reconnaissance operates in accordance with the principles governing the operations of a reconnaissance detachment. It executes missions of close reconnaissance in the zone of operations assigned to the division. When the cavalry divisions withdraw from the front of the army, the divisional cavalry takes over its duties and maintains contact with the enemy. It also executes detailed terrain reconnaissances essential to the movement and tactical employment of the division.

Divisional cavalry is equipped with means of establishing radio communication with the main body.

196. The division commander frequently holds a portion of the division cavalry at his own disposition for the execution of special reconnaissance.

197. During the battle of the main opposing forces, cavalry is employed as required by the situation to cover the flanks of the command, attack hostile flanks or rear, fill gaps, or execute reconnaissance against the hostile flanks and rear. It particularly reconnoiters hostile movement in extension of the wings, the location and movement of hostile reserves and any gaps which may develop in the hostile dispositions.

198. In preparing its attack, cavalry covers its front and flanks with combat patrols. Combat patrols gain contact with the enemy and observe his movements; as long as the situation permits, they remain mounted; when mounted movement is no longer practicable, they continue their operations on foot.

199. Cavalry units assigned to counterreconnaissance as their principal mission seek to defeat or neutralize hostile ground reconnaissance forces. In the execution of this mission, they operate offensively, defensively, or by delaying action.

Counterreconnaissance is most effectively accomplished by the defeat of the hostile reconnaissance forces. Hostile patrol activity is most completely eliminated by the defeat of the stronger detachments which support them.

Defensive counterreconnaissance may be effective when there is available a position of restricted frontages which must be crossed by hostile reconnaissance forces. Cavalry forces engaged in defensive counterreconnaissance are, when practicable, strongly reinforced by infantry and artillery. Cavalry sends out reconnaissance detachments which attack advanced enemy detachments or obstruct their operations.

When a broad front must be covered, it may be necessary to resort to delaying action as a means of temporarily impeding the operations of hostile reconnaissance forces.

200. Reconnaissance by other arms.—Close and intensive reconnaissance by infantry supplements the more distant and general reconnaissance of the air service and cavalry. Infantry reconnaissance assumes especial importance when cavalry is lacking or is deficient in strength and when the proximity of the enemy or terrain conditions preclude the use of cavalry.

Infantry detachments and patrols engaged on close reconnaissance are relieved of equipment not essential to the execution of their missions. Their mobility is, when practicable, further increased by the use of bicycles, motorcycles, and motor transportation. Infantry reconnaissance detachments and patrols seek especially to gain advanced observation points which afford extended views in the direction of the enemy.

In preparation for attack, infantry units cover their front by reconnaissance detachments and combat patrols. The mission of these elements is to locate advanced hostile groups, break through the hostile screen, and secure contact with the enemy's principal forces, etc. After battle, infantry units maintain contact with the enemy by similar means.

Infantry officer patrols reconnoiter covered routes of approach for the advance of their units into action.

201. Artillery conducts reconnaissance for the location of objectives, observation posts, and firing positions, and the exploration of routes of approach. To expedite their entry into action, artillery units send forward reconnaissance details under officers with the advanced elements of the command (divisional cavalry, advance guard) on the march. During combat, reconnaissance parties are frequently located in positions near the leading troops to locate artillery targets, observe the effect of fire, and transmit information relative to the situation. The observation posts of artillery units locate targets and adjust artillery fire.

202. Engineers execute timely reconnaissance with a view to the preparation of the necessary measures for the execution of engineer work. During an advance, they reconnoiter the routes, stream crossings, and sources of water supply to be used by the troops. Reconnaissance of cross-country routes is a necessary preliminary to the development of the command or to its withdrawal from action and whenever, as the result of hostile aerial activity, long-range artillery fire, or other reasons, troops are required to move in a broad formation.

203. When the situation permits, the intelligence personnel of the various units carry out observation over the sector of their unit by means of observation posts. Observation posts of lower units are usually situated near the command post of the unit; large units frequently establish several observation posts in such manner as to cover as completely as possible the zone or sector assigned to them and obtain extended view in rear of the hostile advanced troops. Observers are more or less completely equipped with special observation equipment, depending on the situation and the field of view they are expected to cover. During the progress of an attack, observers move by bounds from one observation point to another. When observation posts are to be occupied for a considerable period, they are more or less permanently installed and fortified. Artillery observation posts carry out observation for general intelligence purposes as well as in connection with the observation of artillery fire. (See also par. 114.)

In defense, the observation posts of the higher command and the artillery are so distributed in depth that the observation service can continue functioning in event of the loss of advanced observation posts.

204. Command reconnaissances.—Early reconnaissance by higher commanders and their staffs of the terrain of deployment is necessary for the prompt organization of the combat action of their units. With this end in view, the commander of the infantry division, or a designated staff officer, accompanied by representatives of the several infantry units, marches with the most advanced elements of the command (divisional cavalry, advance guard). Their reconnaissance is conducted in conjunction with that of the artillery reconnaissance detail and bears especially on the location of the artillery position and the assembly positions for the organization for attack of the infantry or the main line of resistance for the organization of a defense (pars. 405, 507).

Personal reconnaissance of commanders during battle is often necessary to the effective conduct of the action and the proper use of reserves.

CHAPTER VIII.

SECURITY.

GENERAL PRINCIPLES.

205. Information is the basis not only of plans of operation but also of the measures taken by a command for its security. The effectiveness of security measures rests largely upon the timeliness, accuracy, and completeness of information. Reconnaissance and other measures for the procurement of information thus serve the purposes of security.

206. A command protects itself against the surprise attack of hostile ground troops by reconnaissance, by the employment of security detachments, and by the adoption of the necessary measures to insure the readiness for action of its component units. In proximity to the enemy, an advancing force secures itself by an advance guard; a retreating force by a rear guard; a resting force by an outpost. Flanks are, when necessary, secured by flank security detachments. In combat, each unit provides for its own security by the employment of combat patrols.

Readiness for action is assured by the distribution of troops in accordance with their probable tactical employment and provision by each unit for its prompt formation and movement. The degree of readiness for action required varies widely with the situation.

207. Security detachments protect the command against surprise attack by hostile ground forces. By offensive or defensive action, they gain for the command the time and space necessary for it to make the required dispositions. According to circumstances, they attack, resist, or execute delaying action.

208. By the detail of a fraction of the command for the purposes of security, the commander is enabled to dispose the remainder in accordance with his own plan of operations. Security detachments thus serve to preserve the commander's freedom of action.

209. Security detachments constitute a partial commitment to action of the available forces. Their strength should, therefore, not exceed the requirements imposed by the situation. Tactical unity is, as far as practicable, respected in the detail of security detachments.

210. Security and reconnaissance forces operate in accordance with different principles. Within the limitations of the mission assigned to them, reconnaissance detachments and patrols direct their activities with reference to their objectives and are not bound locally to the command in the service of which they operate. Security detachments and patrols regulate their location and movements with reference to the command to be secured.

211. Forces assigned to security missions are also secondarily charged with reconnaissance. Reconnaissance is executed by especially detailed patrols and stronger detachments.

212. Security detachments are also charged with the mission of counter-reconnaissance. They take the necessary measures to prevent hostile ground forces from observing the main body. They devote especial attention to observation points affording views into its dispositions.

213. A command protects itself against hostile aerial attack and observation by the employment of its air forces and antiaircraft weapons, by distribution into small units and groups, by night marches, by concealment, and by camouflage.

SECURITY ON THE MARCH.

214. Advance guards.—A column advancing toward the enemy secures itself in the direction of the advance by the detail of an advance guard. In proximity to the enemy, advance guards are detailed whether or not the front is covered by the cavalry of higher units.

215. The general mission of the advance guard is to assure the uninterrupted advance of the main body and protect it against surprise and observation by hostile ground forces. In proximity to strong hostile forces, the advance guard procures for the main body the time and space required for its deployment for action.

The advance guard assures the uninterrupted advance of the main body and protects it against surprise attack and observation by exploring the terrain to the front and on each side of the line of march, removing isolated hostile resistance, and preparing the route of advance for the movement of the troops (removal of obstacles, construction of temporary bridges, road repair, etc.). It directs its reconnaissance in particular against those points which afford extended observation into the dispositions of the main body or which provide concealment for hostile reconnoitering or harassing detachments. In close proximity to the enemy, it gains the time and space for the deployment of the main body by seizing and holding important features of the terrain, particularly those that will cover the deployment from hostile observation and provide good observation and defilade for the employment of the artillery. According to circumstances, it pushes back hostile covering detachments, or it opposes an enemy advance in force long enough to permit the main body to make its dispositions.

216. The strength and composition of an advance guard vary with the strength of the command, its mission, the situation, and the terrain.

Large commands require a relatively longer time to prepare for action than smaller units, and the proportionate strength of their advance guard is correspondingly greater. An aggressive mission and the probability of strong hostile opposition require a relatively strong advance guard. Greater strength is required as the distance from the enemy decreases. The strength of the infantry may thus vary from a small fraction to one-fourth of the whole command.

Sufficient light artilllery is attached to support the probable combat action of the infantry. Elements of long-range medium artillery may be attached under conditions favoring their employment with a view to taking advantage of opportunities to open fire on favorable distant targets (e. g., hostile troops in column) and forcing the enemy to an early deployment.

Divisional cavalry operating in front of the infantry division may be employed on reconnaissance missions under the immediate direction of the division commander (see par. 195) or attached in whole or in part to the advance guard. When divisional cavalry executes reconnaissance in proximity to the enemy under the immediate direction of the division commander, a small portion of its strength is usually attached to the advance guard for the purposes of local security.

In proximity to the enemy, infantry cannon and tanks are necessary for the close support of the infantry. Armored cars are of special value in reconnaissance.

Engineers are attached in accordance with the needs for bridge and road work and engineer reconnaissance. When the negotiation of a river crossing is in prospect, a bridge train is attached.

Medical units are attached in proportion to the probable severity of combat action. One or more ambulances usually march near the tail of the reserve.

The combat trains of the advance-guard units generally march with the reserve. The field trains march either with the field trains of the command or at the tail of the advance guard, as required by the situation.

The strength of the advance guard of an infantry division will seldom exceed an infantry regiment reinforced by a battalion of light artillery and varying quotas of other auxiliary troops.

217. The distance between the advance guard and the main body is always sufficient to prevent needless interruption of the march. In case of anticipated contact with the enemy, it is sufficient to preserve to the commander his freedom of decision with reference to the employment of the main body and to make his dispositions without serious interference from the enemy, but is never so great as to expose the advance guard to defeat before assistance can reach it. In large commands, the distance between the head of the main body and the rear infantry elements of the advance guard seldom exceeds 2½ miles.

In large commands, the main body normally regulates its march on that of the advance guard. When in special cases it is desired to limit the progress of the advance guard, orders to the advance-guard commander fix the hours before which successive designated points on the route of march will not be passed by a specified element of the advance guard.

218. The march order of the commander of the column contains instructions relative to security. It details the troops for the advance guard and designates the commander; fixes an initial point and the hour at which the advance guard or a specified element thereof will pass or clear it; prescribes the route or zone and objective of the march; fixes the distance at which the main body will follow the advance guard; gives the advance-guard commander such special instructions as may be required by the situation (directions in which security is to be especially provided, special reconnaissances to be executed, terrain features of especial importance to the advance of the main body, river crossings to be secured, engineer work, etc.); and contains indications relative to the transmission of messages (location of the commander of the column, use of the technical means of signal communication, etc.).

219. The formation of the advance guard is, in general, such as to assure its own security and to provide sufficient distribution in depth and in width for its offensive and defensive maneuver.

The distribution in depth from front to rear of the troops of the advance guard usually comprises the advance-guard cavalry, the support, and the reserve.

The distribution in width of the advance guard increases with the proximity of the enemy.

220. The initial order of the advance-guard commander gives such available information relative to hostile and friendly forces as is necessary for the guidance of subordinates, including the zone or route and objective of the march; designates the troops for the several fractions of the advance guard (cavalry, support, reserve); fixes the hour at which the support and, when necessary, the cavalry will reach or clear the initial point of the march and the approximate distance at which the reserve will follow the support; and gives such instructions to the several fractions and elements of the advance guard as may be required by the mission and the situation. According to circumstances, these may include: For the cavalry, instructions relative to reconnaissance (objectives or zone of reconnaissance), indication of first terrain line to be reached, successive terrain lines of importance to the security of the advance guard and the main body; for the support, special reconnaissances to be executed, first position of which possession will be secured, indication of important terrain features along the route of march; for the artillery, state of readiness for action to be maintained during the advance; for the engineers, engineering work to be executed; disposition of field and bridge trains; instructions relative to the transmission of information.

221. The advance-guard cavalry reconnoiters far enough to the front and flanks of the line of march to guard the column against surprise by artillery fire and secure timely information of the enemy and the terrain. If sufficient in strength, it seizes and holds terrain points along the route of march (terrain features covering river crossings, town exits, defiles, etc.), advancing by bounds from position to position. It thus assures, as far as practicable, the continuous movement of the advance guard and the possession of ground facilitating its deployment. When cavalry is required to occupy and hold important advanced positions it is, when practicable, reinforced by infantry in motor trucks, artillery, and machine guns. As proximity to the enemy increases, the necessity for the use of cavalry on the more distant missions disappears, and the requirements of local security and the necessity for flank protection increase; cavalry is then employed in the exploration of the terrain on the immediate front and flanks of the advance guard. Cavalry engaged in local security, generally not exceeding a platoon in strength, is usually attached to the support. Very weak advance-guard cavalry is usually attached to the support from the beginning.

222. The support secures the march of the reserve and executes the necessary local reconnaissances on the front of the advance. It provides for the execution of reconnaissance and its own security by sending forward an advance party.

223. The support is given sufficient strength for the execution of its reconnoitering and security missions. In an advance guard of the strength of a regiment it will seldom exceed a battalion. When contact with enemy elements is probable, infantry, cannon, and machine guns are included in the composition of the support. Mounted messengers, cyclists, motorcyclists, and signal men are attached for the purposes of communication.

224. According to the situation, the support reinforces the action of its advance party in dealing with minor resistances, or covers its retirement in the face of an enemy advance in force. In any case, it offers sufficient resistance to permit the reserve to prepare for action.

225. When the divisional cavalry does not form a separate element of the advance guard, the advance party constitutes the principal advance-guard reconnaissance detachment. It is made strong enough to furnish the patrols required for the reconnaissance of the front of the advance and lend them adequate close support. The strength of the advance-party infantry does not ordinarily exceed one company; when practicable transportation is furnished for carrying infantry packs. The greater part of the cavalry of the support is usually attached to the advance party.

The distance of the advance party from the remainder of the support does not ordinarily exceed 500 yards.

226. The advance party sends forward an infantry patrol (point) along the route of march and such other patrols to either flank as may be necessary. In open country, cavalry usually furnishes the flank patrols; a cavalry patrol frequently precedes the point. An armored car is, when available, usually attached to the point.

Mounted patrols advance by bounds from one designated terrain line to another. The advance-party commander regulates their movement by the successive assignment of close objectives.

227. Connection between the elements of the advance guard is maintained from rear to front. As far as practicable, mounted men, motorcyclists, and cyclists are employed for this purpose.

228. Until hostile resistance is encountered, or information indicates the probability of contact with enemy elements, the advance party will be able to cover a sufficient frontage by advancing along the route of march and sending out patrols to reconnoiter important points to the front and flanks.

As soon, however, as hostile resistances are encountered it will be necessary for the leading elements of the advance guard to move on a broader front. Prompt support of the leading elements in dealing with hostile resistances will be necessary, and provision will have to be made to prevent infiltration of hostile elements seeking to attack the main body or rearward subdivisions of the advance guard.

At the same time that the front is extended the necessity for close support will generally require a reduction in the distances separating the elements of the advance guard.

229. Hostile resistances are reduced by direct attack and enveloping or outflanking action. The support commander supports the action of the advanced elements by the employment of the infantry cannon, machine guns, and the infantry of the support, and by arranging for support by the advance-guard artillery.

Isolated hostile resistances will generally fall as the result of the outflanking action of advance-party elements advancing on either side. Fractions of the advance guard which are not held up will, therefore, best assist those which are stopped by continuing the advance.

230. The reserve constitutes the principal maneuvering and offensive element of the advance guard. It therefore comprises as large a part of the strength of the advance guard as is consistent with its own security and the preservation of its maneuvering power. The greater portion of the auxiliary troops assigned to the advance guard usually march with the reserve.

The reserve follows the support at a distance sufficient to enable it to deploy for action in an effective manner. In large advance guards this distance does not ordinarily exceed one mile.

231. As soon as the situation indicates the necessity for artillery support, the advance-guard artillery marches in a state of increased readiness for action. One echelon of the artillery takes up a position in readiness or in observation, while the other moves forward to an advanced position. The artillery thus successively advances by echelon from position to position.

An artillery liaison detachment marches with the support.

232. In the general case the commander of the troops marches with the advance guard when combat is in prospect and from time to time gives the advance-guard commander additional instructions based on his personal knowledge and reconnaissance of the situation.

The combat action of the advance guard is regulated with reference to the requirements of the main body. The mass of the advance guard is therefore put into action only for the purpose of gaining or retaining advantages which contribute to the tactical success or security of the main body. It must always be borne in mind that the object sought in approaching contact with strong hostile forces is to collect the available forces with a view to delivering a shattering blow with the concentrated striking power of the entire command. Action by the advance guard independent of the objectives and situation of the main body may commit the entire command to a course of action conditioned by the situation created by a fraction of its strength and compel the commander to send in units of the main body in piecemeal support of the advance-guard combat. So far as practicable, endeavor is made to hold the principal advance-guard forces well in hand for unified employment in the execution of missions of importance to the success of the main body and to avoid dissipating the advance-guard strength in minor detachments. Forces will thus be available for the seizure of important points, the execution of reconnaissances in force, and finally for covering the development and deployment for action of the main body.

233. The general principles governing an advance guard of a force of all arms also apply to cavalry units. The principal modifications result from the superior

mobility of cavalry and the necessity for regulating the march of the advance guard on the main body, due to the greater variation in cavalry gaits.

A cavalry advance guard usually moves by bounds from one terrain line to another. On each line it halts until the main body has reached the previous line. Terrain lines that cover the passage of river crossings and defiles are of especial importance. Within the advance guard, its several elements advance by shorter bounds; crests which afford sufficient view to the rear chiefly determine the length of the bounds.

On account of the fact that the flanks of a cavalry command are usually unsupported, greater provision is necessary for security on the flanks and rear of the column. Adjacent parallel roads are covered by patrols or stronger detachments.

234. Rear guards.—A retreating force covers its retirement by the detail of a rear guard. When troops have been in action, the rear guard is constituted from the least tried available units.

235. The mission of the rear guard is to assure the uninterrupted retirement of the main body and its protection from hostile attack and ground observation. By the successful execution of this mission a rear guard covering a withdrawal from action enables the main body to avoid accepting battle and regains for the commander of the troops his freedom of action. The strength and composition of a rear guard are such as to permit of the execution of its mission without the intervention of the main body. The rear guard can not count upon the support of the main body but must be able to accomplish its mission with its own means.

236. A rear guard covering the withdrawal of a force from action initially consists principally of infantry supported by artillery. Contingents of other arms are added in accordance with the requirements of the situation. Engineers are attached in a proportion depending upon the extent of demolitions and destructions to be carried into effect. A rear guard is usually strong in artillery and machine guns on account of their power to force the enemy to deploy at long range and delay his advance. The ability of cavalry to conduct delaying action makes it an especially important element of a rear guard when the main body has succeeded in gaining sufficient distance from the enemy; it may then constitute the principal element of the rear guard.

237. The formation and the method of operation of the rear guard are adapted to the situation. When in contact with the enemy, the rear guard distributes its forces in groups over a wide front and opens artillery and machine-gun fire at long range with a view to forcing the enemy to deploy and thus delay his advance. Unless the security of the main body requires a stubborn resistance, the rear guard, as far as practicable, avoids close-range combat and retires successively from position to position as the enemy approaches. Cavalry covers the retirement and maintains contact with the enemy. The successive positions of the rear guard are chosen at such distance from each other that the enemy is forced to renew his preparations for attack in front of each of them and that the changes of position by the artillery of the rear guard are reduced to a minimum. A position should also favor a withdrawal by affording a good line of retreat. Smoke screens may often be effectively employed to cover the movement of withdrawing troops. When the enemy presses his pursuit closely, greater resistance is offered; advantage is taken of favorable opportunities to punish over-hasty pursuit by counteroffensive action. Cavalry attack against the flanks of pursuing columns is often an effective means of disorganizing the enemy's pursuit. When practicable, batteries or single guns occupy positions with a view to taking pursuing elements under flanking fire. The air service of the command supports the action of the rear guard by reconnaissance and by attacking hostile aircraft and ground troops. The most favorable time for offering a determined resistance is during the late hours of the day which will permit of the withdrawal of the rear guard under the cover of darkness.

238. When the distance from the enemy permits, the rear guard retires in march formation. Its distribution corresponds, in general, to that of an advance guard, and in order of march comprises the reserve, the support, and the rear-guard cavalry. The support detaches a rear party and the necessary flank patrols. The rear party detaches a rear point and, when necessary, other covering patrols. In view of the direction of march, infantry reconnaissance during movement is much more restricted than in the case of the advance guard; the chief reliance must be placed upon cavalry for the execution of the necessary reconnaissances. Cavalry especially observes and forestalls enemy attempts to pass the rear guard on the flanks. Infantry supports provide security by breadth of dispositions when contact with the enemy is probable.

239. In the disengagement of a force from action, and whenever the enemy closely presses his pursuit, the commander of troops, when practicable, seeks to gain the necessary distance by fixing the time limit within which the rear guard must prevent the enemy from advancing beyond a designated terrain line. When necessary to the security of the main body, the rear guard sacrifices itself in the execution of its mission.

240. Flank security.—In addition to the reconnaissance carried out by the support of advance and rear guards, it will sometimes be necessary for the reserve and the main body to send out patrols to the flanks of the line of march. Special flank reconnaissances are ordered by the commander of the advance guard and the commander of the troops.

When the flanks of the command are not protected by adjacent units, it will frequently become necessary to provide stronger flank protection by the detail of a flank guard.

241. As a rule, flank-guard duty requires a high degree of mobility. Greater distances must be marched than in the case of troops assigned to the main body, and equal distances must often be covered in shorter periods of time. When practicable, flank guards consist principally of cavalry or especially mobile infantry with the necessary artillery support. Cavalry is especially suitable to detail on flank-guard duty on account of its ability to carry out extensive reconnaissance and effect rapid communication with the main body.

242. The operations of flank guards are conducted with especial reference to the routes which give access to enemy attack against the flanks of the command. When the locality from which an enemy attack is to be apprehended is well defined, a flank guard occupies a position covering the routes of approach until the command has passed. Infantry detailed on a mission of this character must start its march in advance of the movement of the main body; on the completion of its mission, it joins the rear of the column.

When several such localities must be successively passed during the progress of a march, echelons of the flank guard move by bounds from one position to another. A mission of this character requires the detail of cavalry or especially mobile infantry.

When a route generally parallel to the line of march of the main body exists, and more or less continuous flank protection is required throughout the depth of the column during the march, the flank guard marches parallel to the main body distributed in detachments over sufficient depth to be able to offer resistance to enemy attack at various points on the flank of the main body and to deal with the inroads of small hostile detachments.

243. In principle, the main body and the advance guard assure their own flank protection. When the necessity for detaching a flank guard for the protection of the main body during the course of the march can be foreseen, it will sometimes be advantageous to attach the flank-guard troops to the advance guard in order to give them the time required to reach their positions.

244. When the main body executes a flank march in proximity to the enemy, flank protection assumes great importance, and the detail of a strong flank guard is frequently necessary. When the main body changes its direction of march from the front toward a flank, it may be advisable to convert the advance guard into a flank guard and to detail a new advance guard.

245. A flank guard makes the necessary provision for its own frontal and flank security.

246. Flank security is of especial importance during a retreat. Cavalry detachments march on adjacent parallel routes when these are not occupied by other columns.

247. Antiaircraft protection.—A marching force protects itself against aerial attack and observation by the offensive action of its own air forces, the employment of antiaircraft weapons, and appropriate march dispositions.

When danger of aerial attack exists, units designated for antiaircraft defense march in a state of readiness for action. Elements of antiaircraft artillery advancing by bounds follow the advance guard and the tail of the combatant elements of the main body or move on parallel routes when the latter are not occupied by adjacent columns.

March dispositions for the purpose of neutralizing hostile aerial activity include night marches and the distribution of the march column into smaller units, involving cross-country movement. (See pars. 319–329.)

OUTPOSTS.

248. General principles.—The provisions made by a resting command for its security vary widely with the situation.

When contact with the enemy is remote, large units go into shelter in column of march. The leading elements of the column provide security in the direction of the enemy by occupying the terrain features which control the routes leading from the enemy and afford facilities for observation. The depth of dispositions increases the length of hostile routes of approach to the shelters of the troops, and thus, in general, confines an enemy advance to the roads. By holding the positions controlling the routes of approach and making the necessary provisions for their own security, the leading units assure the general security of the command. (See par. 366.) Greater security may be obtained by advancing the leading units to a greater distance from the remainder of the command. Local security by the various units of the command is obtained by the detail of the necessary interior guards; in hostile territory, interior guards assume especial importance. (See pars. 366–367.)

As the distance from the enemy decreases, a higher state of readiness for action becomes necessary. Units are distributed in shelter with reference to their probable tactical employment and generally occupy a more or less extended frontage. The routes of hostile approach are thus greatly shortened, and it becomes necessary to offer greater resistance in an advanced position in order to gain for the command the time required for its preparation for action; penetration in the intervals between roads must also be prevented. Provision is made for the security of the command by the detail of an outpost, more or less completely organized, depending on the information available and degree of definition which the situation has acquired.

Security requirements generally increase with the length of time a command remains in occupation of a locality.

249. An outpost is a covering detachment detailed to secure a resting command or a defensive position against surprise and observation by hostile ground forces. In proximity to the enemy, the outpost of an infantry division holds a line of resistance so located as to prevent hostile light artillery from firing upon the positions held, or the shelter occupied by, the troops of the main body.

When the distance of the hostile forces from the main line of resistance of a defensive position is too reduced to permit of the establishment of a divisional outpost, each battalion in the combat echelon covers its sector by the detail of a combat outpost; the action of the several combat outposts is coordinated by the division orders. When battle is interrupted by nightfall and troops bivouac on the battle field, combat outposts are established by the leading companies or battalions. (See par. 510.)

When the command makes a long halt during the course of a march, the advance or rear guard establishes a march outpost usually formed by extending the support; units of the support occupy critical features of the terrain controlling the approaches to the column, establish outguards or lookouts at commanding points, and, when necessary, send out patrols.

250. A resting command provides for outpost protection in those directions which afford hostile forces access to the location of the main body. In such directions the outpost occupies a position controlling the roads and the features of the terrain that afford facilities for extended observation; the control of observation points which if in the possession of the enemy would permit him to direct the fire of long-range artillery on the main body is of especial importance.

Flank security is, when necessary, provided for by refusing the flanks of the outpost position and by establishing detached posts on roads or at important observation points which lie outside the sector covered by the outpost.

251. The mission of an outpost is to furnish the command with information relative to the enemy, to protect the main body against surprise attack and observation by hostile ground forces, and to gain the time required for the main body to make the necessary dispositions. It is thus charged with the general missions of reconnaissance, counterreconnaissance, and resistance. The priority to be given to these missions varies with the situation and the mission of the command.

252. Strength and composition.—The strength and composition of an outpost vary with the distance and the attitude of the enemy, the terrain, the degree of resistance, extent of reconnaissance and other special duties expected of it. An outpost of a force of all arms may thus comprise varying proportions of all the combatant arms except the air service and have an infantry strength varying from a small fraction to one-fourth of the strength of the command. It should be no stronger than is consistent with reasonable security. The most economical protection is furnished by keeping close contact with the enemy by means of outpost patrols in conjunction with resisting detachments on the avenues of approach.

Infantry ordinarily constitutes the principal element of an outpost.

The expediency of assigning divisional cavalry to an outpost will largely depend upon the proximity of the enemy and the priority of the several missions requiring the employment of cavalry. When the distance from the enemy is so reduced that cavalry must be withdrawn from the front of the division at night, divisional cavalry may be wholly or partially assigned to the outpost for the execution of daylight reconnaissances.

In proximity to the enemy, artillery is usually assigned to the outpost for the direct support of the outpost infantry and antitank defense.

253. Relief.—In large units on the march, security duty, including advance or rear guard and outpost service, is frequently performed by the same troops for a period of several days. When the command halts during an advance. the outpost troops are usually furnished by the advance guard; relief from security duty is generally effected by the detail of a new advance guard when the movement is resumed. During a retreat the rear guard usually furnishes the outpost troops; relief from security duty is generally effected by the detail

of an outpost from the main body when the command goes into shelter. When the command remains stationary for a prolonged period, the outpost is ordinarily relieved at intervals of several days. The frequency of reliefs is regulated according to the arduousness of the service.

In small commands the detail and relief of security troops take place according to similar principles though at more frequent intervals, usually daily.

During an advance the outpost ordinarily stands relieved when the support of the advance guard has passed the outpost line of resistance.

254. Orders for establishing the outpost.—The halt order of the commander of the troops, besides assigning locations to the various elements of the command and designating, when necessary, the position to be held in case of attack, contains instructions relative to security. These instructions detail the outpost troops, assign an outpost commander, and designate the outpost line of resistance and the limits of the sector to be covered by the outpost. According to circumstances, they indicate whether in case of hostile attack in force the outpost is to hold its position either definitely or for a prescribed period or is to conduct a delaying action falling back on the main line of resistance. They outline special reconnaissances to be carried out and indicate the directions which are to be especially guarded.

Instructions of higher commanders provide for the necessary coordination between the outposts of adjacent subordinate units. The degree of coordination required varies widely with the situation; instructions should never be so rigid as to hamper the initiative of a subordinate charged with an aggressive mission; in defensive situations, more definite prescriptions are often necessary. When necessary to insure close coordination between the dispositions of adjacent outposts, higher commanders designate a common outpost line of resistance and assign sections of the outpost line of resistance to each unit; they may further indicate the important areas to be held, fix the strength of the several outposts, and prescribe their conduct in case of hostile attack. They regulate the support to be given by the artillery under their immediate control to the troops of the several outposts.

255. Telephonic communication between the command posts of the commander of the troops and the outpost commander is established by the commander of the troops.

256. Distribution of the troops.—The outpost of a large command is distributed into a reserve, supports, and, when cavalry is attached, the outpost cavalry. When important points to be secured lie outside the sectors of the supports, detached posts are detailed by the outpost.

The missions and the dispositions of the several fractions into which the outpost is distributed depend upon the mission assigned to the outpost and the situation.

Against minor hostile enterprises and when the outpost is required to hold its position against hostile attack in force, the supports constitute the principal echelon of resistance of the outpost. They are usually placed at the more important points on or near the outpost line of resistance. As a general rule, roads exercise the greatest influence on the location of supports in open situations, and a support is generally placed on or near a road. Each support is assigned a sector which is clearly defined by means of tangible lines on the ground. Supports furnish the outguards and patrols required for the observation service of the outpost. Supports vary in strength from a platoon to a company. Machine guns are attached to supports as required. Supports are numbered consecutively from right to left.

The mission of the reserve is to support the troops in front by reinforcement or by counterattack, or in case the outpost is assigned a delaying mission to

hold a rallying position on which they may retire in event of a hostile attack in force. It is so located that it can readily occupy the line of resistance, and when its mission requires delaying action take up a position covering the retirement of the supports.

By day, the outpost cavalry executes reconnaissances in front of the outpost; at night, it usually withdraws behind the outpost line of resistance leaving small observation groups on the roads.

257. Establishing the outposts.—Upon receipt of the orders for the establishment of the outpost, the outpost commander makes his dispositions with the least practicable delay. Until the leading outpost troops are able to assume their duties, temporary protection is afforded by march outposts established by the advance or rear guard. In large commands it will frequently be necessary for the outpost commander to give his initial orders from the map, but when practicable preliminary reconnaissance is made. In proximity to the enemy, the initial orders insure the prompt execution of the most urgent measures to prepare the outpost to meet a hostile attack; details and the rectification of preliminary dispositions are regulated by subsequent instructions.

In accordance with the instructions received from the commander of the troops, the outpost commander designates the outpost line of resistance; fixes the distribution of the outpost troops; assigns to each support its location and the sector it is to cover; prescribes the location and disposition of the reserve and its conduct in case of attack; provides for the necessary detached posts; gives the outpost artillery the necessary instructions to assure the support of the outpost infantry, when necessary assigning it a position in readiness or in observation. He prescribes the disposition of the field trains if they are ordered to join the outpost and gives the location of his command post.

After issuing the initial orders, the outpost commander inspects the outpost position, coordinates the dispositions of the several supports, completes his arrangements by more detailed instructions where necessary and sends his superior a report of his dispositions. When in contact with the enemy, he makes provision for antitank defense by construction of tank traps and the employment of antitank weapons and for blocking the roads against a hostile advance. When hostile attack is probable, he prescribes the degree of readiness for action of the several elements of the outpost as required by the situation.

258. In occupying their positions and during the progress of a relief, the various subdivisions of the outpost conceal their movements as far as practicable against both ground and aerial observation, taking advantage of existing covered routes of approach. They prepare their positions for defense unless the situation renders such action unnecessary. As soon as practicable, the subdivision commanders make a report of their dispositions, accompanied, if practicable, by a sketch, to the outpost commander.

259. Prominent points within the outpost position in rear of the outguards which afford extensive view over the foreground are occupied as observation posts as directed by the commanders of the several subdivisions and the outpost commander.

260. When supports are to be furnished from more than one battalion, a sector of the outpost position is assigned to each battalion furnishing the supports. Battalions assigned to sectors of the outpost position usually hold out their own reserves. When battalions are assigned to sectors of the outpost position, the outpost commander issues his orders for the occupation of the line of resistance to battalion commanders.

261. Supports.—The supports are the principal agencies of security of the outpost. They constitute the strong points of the line of resistance and provide for their own security and the observation service of the outpost by establishing outguards and sending out patrols.

262. The supports march to their posts, securing their march by the necessary covering detachments when in advance of the march outpost. A support commander marches with the advanced elements of his unit, reconnoiters the ground, and prepares to make his dispositions. He details the troops for the different outguards, assigns their location, and, when necessary, designates the sector each is to cover. He establishes the necessary sentinels at the post of the support and makes provision for the patrolling to be executed from the support.

An outguard varies in strength from four men to a platoon, depending on the number of sentinels it is required to furnish and its location. Posts at a short distance from the support may be held by weak outguards while important posts at a considerable distance must be more strongly held. Outguards are numbered consecutively from right to left in each support.

The support commander in posting his unit seeks to cover his sector in such manner that the enemy can not reach the section of the line of resistance assigned to the support in dangerous numbers unobserved. On the other hand, he economizes in the number of men used on observation and patrol duty. He organizes the defense of the section of the line of resistance assigned to him as required by the situation. In proximity to the enemy, he organizes a strong point for the defense of his position; a unit detailed as a support is usually deployed on a frontage and in a depth corresponding to its deployment in defensive combat. Each strong point on the line of resistance is so organized as to command an adequate field of fire to the front and to sweep with its fire the intervals between its position and those of adjacent supports.

263. As soon as the posting of the support is completed, the support commander inspects its dispositions, rectifies defects, and makes a report of his dispositions, preferably accompanied by a sketch, to his immediate superior. He indicates the spaces which are dead to the fire of infantry weapons and especially require artillery support. He renders subsequent reports covering additional developments and embodying the information collected by his support. He maintains connection with adjacent supports and keeps them informed as to his situation.

The support commander prescribes the degree of readiness for action of the support. The maximum degree of rest compatible with the situation is accorded to elements not engaged in observation or patrol duty. Except when especial vigilance is required, sufficient readiness for action can be assured by the posting by the support, or by each platoon, of lookouts charged with giving the alarm in case of hostile activity. Greater vigilance is required in case of fog and toward dawn; it may then be necessary to cause the entire support to stand to arms and to draw in the outguards closer to the support. At night, it will sometimes be advisable to place the outguards in positions different from those which they occupy during the day. In such cases, the ground is carefully studied before dark, and the change made at dusk. Where an outpost occupies a position for a considerable length of time in close proximity to the enemy, provision must be made for frequent change in the position of outguards in order to avoid capture by hostile raiding parties.

In each company at least one officer and in each platoon one noncommissioned officer are constantly on duty. They are responsible to their respective commanders for the service of security of their unit. They make frequent inspections to assure themselves of the vigilance of sentinels and their proper instruction and ascertain whether they have any information to report.

264. The outguards.—Outguards comprise pickets, sentry squads, and cossack posts.

A picket is a group consisting of two or more squads, ordinarily not exceeding a platoon, posted at important points (road forks, defiles, important observation posts) in front of the line of resistance to cover a given sector. It furnishes patrols, and one or more sentinels, double sentinels, sentry squads, or cossack posts for observation.

A sentry squad is a squad posted in observation at a given point. It posts a single or a double sentinel in observation, the remaining men resting nearby and furnishing the reliefs for the sentinels.

A cossack post consists of four men. It is an observation group similar to a sentry squad but employs a single sentinel.

265. Each outguard commander marches his outguard to its assigned location, securing his movement by the necessary reconnaissance. He explains the situation to his men and establishes reliefs for each sentinel, and when practicable, for each patrol to be furnished. In addition to the sentinels required for the general observation of the sector assigned to it, a picket establishes a sentinel at its post.

The commander then posts the sentinels and gives them their instructions.

When in close contact with the hostile outpost, the establishment of listening posts at night in front of the general line of observation may become necessary.

266. Sentinels.—Sentinels are numbered consecutively from right to left in each outguard. Sentry squads and cossack posts furnished by pickets are counted as sentinel posts.

267. Sentinels are charged with the observation of a certain portion of the foreground of the outpost position, with the discovery of indications of hostile activity, and with giving the alarm in case of hostile attack.

268. Sentry posts are located at positions affording an unobstructed view and concealment from the enemy. The field of view may be extended by the occupation of an elevated post (tops of trees, roofs of buildings, etc.). Concealment may be provided by the construction of artificial cover where natural cover is insufficient. Sentinels are as far as practicable equipped with field glasses. Double sentinels must be near enough to each other to communicate in ordinary tones.

269. Sentinels observe constantly to the front and flanks of their position and devote especial attention to unusual or suspicious occurrences. Upon the discovery of important indications, they notify their immediate superior. In case of hostile attack, they give the alarm by firing rapidly or by discharging rockets or flares. They give the prescribed signal in case of gas attack. Sentinels at the post of a picket or support observe the sector as far as the posts of sentinels of the line of observation; according to instructions in each case they repeat the signals given by advanced sentinels or notify the picket or outguard commander.

270. By day, sentinels permit the passage of authorized persons on recognition; at night, they challenge all persons approaching their posts. They detain all persons not recognized as having authority to pass their posts; persons detained are conducted to the post of the outguard or sent to a designated examining post. Persons who fail to halt or who otherwise disobey a sentinel are fired upon after a second warning or sooner if they attempt to attack or escape. Deserters and bearers of a flag of truce are disarmed and conducted to the post of the outguard.

271. Sentinels assume a standing, sitting, or prone position as directed by the outguard commander.

272. The special orders of a sentinel cover the following subjects: Information relative to the enemy; the location of friendly troops, the number and position of adjacent sentinel posts, the location of the picket and the support and the routes thereto, the location of advanced elements; the number of his post; the terrain features and directions to be especially watched and the names of important features (villages, streams, etc.); the position to be assumed, whether

standing, lying, or sitting; conduct in case of attack, use of alarm signals; location of examining post, if any.

273. The tour of duty of a sentinel is ordinarily for two hours; when the service is especially arduous, reliefs may be effected at more frequent intervals.

274. **Patrols.**—The field of view held under observation by the outpost by means of sentinels is extended by patrols detailed by pickets and supports. Patrols execute reconnaissances in advance of the line of sentinels and especially reconnoiter positions of the foreground which are masked from the view of sentinels and observation points and are too distant to be included in the outpost lines. Infantry patrols do not ordinarily operate at a distance in excess of two miles from the outpost line of resistance.

Patrolling in front of the line of observation is of especial importance during the hour preceding dawn.

275. Instructions given to a patrol leader cover the available information relative to the enemy and friendly troops; the mission of the patrol; the general route to be followed and the sentinel post by which the patrol will pass on its departure and return; terrain features of especial importance; the time at which the patrol will return.

On their departure, patrols inform the sentinel on their route as to their mission and on their return transmit to him the results of their reconnaissance.

276. When the situation requires strong support of the action of patrols, the outpost commander may detail a reconnaissance detachment (see par. 177) for the execution of a specific mission.

When the outposts of opposing forces are in close contact, reconnaissance is largely restricted to night patrolling. Night patrolling requires systematic organization, careful preparation, and the cooperation of advanced outpost elements with the activity of the patrols.

277. Within the outpost position, infantry patrols are employed by supports and pickets to maintain contact with their advanced elements and with adjacent support and pickets and to reconnoiter the ground between sentinel posts. Patrols are employed instead of sentinels to hold under observation ground which affords a limited field of view. In close country, patrols constitute the principal organs of observation of the outpost.

278. When cavalry is attached to the outpost, the zone of reconnaissance of the outpost is extended by cavalry patrols or reconnaissance detachments.

279. **Reserve.**—The reserve is marched to its post by its commander who then sends out such detachments as have been ordered and places the remainder at rest; at least one sentinel is stationed at the post of the reserve. Connection is maintained with the supports and near-by detached posts. Each unit of the reserve is informed as to its place of formation in case of hostile attack.

280. **Cavalry outposts.**—Except when in close proximity to the enemy, a cavalry unit does not secure itself by a completely organized outpost. It sends out security detachments (troops, platoons) to hold critical points on the routes of approach from the front and flanks. These detachments are preferably posted at points that the enemy will be forced to pass in his advance (defiles, streams, crossings, etc.). They provide for their own security by posting outguards and sending out patrols and oppose a hostile advance long enough to permit the main body to make its dispositions. Outguards are posted in the vicinity of the shelter of the main body.

281. In closer proximity to the enemy, security measures approach a more continuous outpost organization. When the security troops occupy an extensive front, outpost sectors are assigned to the various security detachments. When necessary, portions of the main body are held in readiness for immediate action.

282. In immediate proximity to the enemy, the outpost organization conforms to the general principles of an outpost of all arms. An outpost commander is detailed and a reserve is constituted. Outguards usually leave their horses with the rearward echelons of the outpost.

CHAPTER IX.

TROOP MOVEMENTS.

GENERAL PRINCIPLES.

283. Troop movements are effected by marching, by motor transportation, by rail, and by water. The method to be employed depends upon the situation, the size and composition of the unit to be moved, the distance to be covered, the urgency of execution, the condition of the troops, and the availability and capacity of the different means of transportation.

284. In proximity to the enemy, troop movements are generally executed by marching; motor transportation may be employed for the purpose of increasing the operative mobility of foot troops assigned to missions requiring increased mobility.

285. The time required by a unit to prepare for a rail movement, assemble at entraining stations, load equipment, and clear entraining stations, unload equipment and re-form or redistribute its forces in the detraining area determines a minimum distance over which troops can be moved more rapidly by rail than by marching. In the case of large units, these operations usually involve a more or less considerable period, varying with the distance of the troops from the entraining stations, facilities for loading and unloading at entraining and detraining stations, and the distance of the destination of the troops from detraining stations. The time required for the transfer by rail of an infantry division from one area to another can seldom be reckoned at less than four days; rail movement will seldom be more rapid than marching for distances less than 75 miles. For distances less than 75 miles, it is generally expedient to move an entire division by marching or by a combination of marching and rail or motor transportation; smaller units may be moved by rail over shorter distances.

Great masses of troops can be entrained only at stations where facilities for entrainment have been prepared in advance. The movement of large bodies of troops may, therefore, be restricted to certain lines and their entrainment or detrainment to certain large stations.

286. Motor transportation can, as a rule, be applied to the movement of only a part of a large unit. Its use for this purpose usually involves a temporary separation of the troops from their animal-drawn transportation. When foot troops alone are transported, they are temporarily separated from supporting artillery. Motor transportation can, therefore, be employed for the movement of a large unit only when it is possible or necessary to dispense with close tactical union of its elements during the movement.

Motor transportation may be advantageously employed for the transportation of foot troops for distances in excess of 12 miles. Animal-drawn transportation usually executes the movement by marching. Machine guns and infantry cannon, with or without their carts, may be moved by motor transportation.

Movement of artillery units by motor transportation usually involves a temporary separation of the guns from the other carriages and the horses. When the situation permits such separation, motor transportation may be advantageously employed in the transportation of artillery units for distances in excess of 35 miles. Guns and ammunition are loaded on trucks; horses, caissons, and limbers move by marching.

287. In order that they may make timely preparations for the execution of a movement, units are given notice of impending movements by the issuance of warning orders in advance of the formal movement order. In so far as is compatible with considerations of secrecy, warning orders state the nature of the movement, the time when the movement is to commence, the objective of the movement, and any special arrangements to be made in preparation for the movement (e. g., measures for the evacuation of sick and wounded, forwarding of quartering parties, supply arrangements, arrangements for disposal of surplus property, etc.).

288. In all troop movements involving a separation of units from their trains, special arrangements are made for their subsistence en route and the resumption of the functioning of the normal system of supply on arrival at destination.

MARCHES.

289. General principles.—The ability of the command to concentrate superior forces at decisive points depends in large measure upon the march capacity of the troops. Excessive demands upon the march capacity of the troops greatly reduce their fighting power and thus nullify in large measure the advantage obtained by superior rapidity of movement. It is the task of commanders to reconcile, as far as practicable, the conflicting requirements of rapidity of movement and conservation of fighting power by adapting their dispositions to the situation, making careful march preparations, enforcing strict march discipline, and the observance of the rules of march hygiene, and taking measures for the avoidance of unnecessary hardship.

A successful march is one that places the troops at their destination at the proper moment and in the best possible condition.

290. March dispositions.—The factor which exercises the greatest influence upon dispositions for marching is the proximity of the enemy.

When contact with the enemy is remote, the principal object of march dispositions is to facilitate the movement of the troops. As far as permitted by the requirements of tactical unity, march columns are composed of elements having the same march rate. Based on their practicability for the movement of the several columns thus constituted, separate roads are assigned to the several columns; or the movement of the columns by the same road is echeloned in time. Field trains ordinarily march with their units. The necessary measures are taken to guard against hostile aerial observation and attack.

When contact with the enemy is probable, tactical considerations govern march dispositions. March columns are constituted in accordance with tactical missions, and the several elements of each column are distributed in accordance with the requirements of security and their probable order of intervention in combat. Field trains usually follow at the rear of the combatant troops.

291. A large unit advancing against the enemy is assigned a direction and a zone or route of march.

A large unit whose zone of march includes several routes distributes its zone to its component units on the basis of the available road net and its own plan of maneuver. Tactical unity is observed in the distribution of the road net.

When the enemy is distant, the necessity for retaining the power of maneuver usually requires a large unit to move in a broad and deep formation. The breadth and depth of formation make available a relatively extensive road net and permit the regulation of march by smaller units, thus facilitating the march and decreasing the fatigue of the troops. Army troops either march under the direct control of the army commander or are attached to corps for march purposes; corps troops march in accordance with similar principles. Divisions form their com-

ponent or attached units into march columns on the basis of march rates; separate routes may, when available, be assigned to the several columns; the march of troops moving by the same route may be conducted in smaller units (brigades, regiments, etc.).

With the closer approach to the enemy, readiness for battle requires a diminution in the depth of march formation; the frontage available for the march of each unit also decreases. March columns are constituted in accordance with tactical missions.

Certain elements are ordinarily not included in the march columns of other troops but move habitually by bounds:

Air service units move in long bounds of several days' march.

Antiaircraft artillery moves by echelon and by bounds.

Motorized units move by bounds except when tactical considerations require their incorporation in the march columns of other troops.

292. The distribution of the troops in a column formed with a view to the execution of a tactical mission comprises the advance or rear guard; the main body; the field trains; and the service trains (see par. 645). The formation and movement of each of these groupings is regulated by a designated commander in accordance with instructions of the column commander. Distance between the groupings is regulated by the column commander.

293. In each arm of the service and the trains, movement is based upon a march unit which moves and halts at the command or signal of its commander. The march units comprise: In foot troops and horse-drawn artillery, the battalion; in the cavalry, the squadron; in motorized artillery, the battery; in wagon and motor trains, the company. Smaller separate units may be constituted as march units or attached to march units for march purposes.

Regulation of the march by means of march units reduces the effects of checks in the march and limits the elongation of the column.

294. The march frontage of a column depends chiefly on the character of the road and the situation.

Infantry usually marches in column of squads (frontage of 4 men plus intervals), cavalry, mounted officers, and men, and led horses in column of twos, vehicles in single file. A broader formation may be adopted when road conditions and the situation permit. Small units may march on a narrower frontage with a view to lessening the hardships of the march; in large units, the frontage is decreased only when absolutely necessary.

295. Distances are maintained between march units with a view to minimizing the effects of irregularity in the march.

Normal distances in front of each march unit are as follows: Infantry, cavalry, and horse-drawn artillery and trains, 30 yards; motorized units, 50 yards.

The commanders of the several units and their staffs march in the distances at the head of their units. In the case of march units in front of which marches a regimental or brigade staff, the distance is increased 10 yards for each staff.

The prescribed distances may be increased for the purpose of decreasing the vulnerability of the column to aerial attack, increasing the comfort of the men, or for other special reasons.

296. In each march unit, the order of march of the several component units is changed daily; the leading unit on any day's march forms at the tail of the march unit on the following day. Alteration in the order of the march of larger units may also be ordered when permitted by the situation.

297. The routes are, when necessary, reconnoitered prior to the commencement of the march and timely measures taken for removal of obstacles, preparation for stream crossings, etc.

298. The formation of the column.—A march column is ordinarily formed by the successive arrival of its component units at an initial point on the route of march.

The movement of a unit past the initial point is regulated by prescribing the hour at which the unit will either pass or clear it.

The hour of passage is the hour at which the head of the unit reaches the initial point; the hour of clearance is the hour at which the tail of the unit reaches the initial point.

The calculation of the hour of passage of the initial point by any unit in rear of the leading unit is based upon the march rate and the march depth of the preceding unit (including elongation) plus the distance separating the two units.

The elongation of a unit varies greatly with road conditions, weather, and the condition of the troops. Ordinarily it may be reckoned at from 10 to 25 per cent of the march depth of the unit.

Several initial points are designated when the designation of one initial point might result in congestion or in the crossing of the paths of units in their movement toward the initial point. The hour of passage of a rearward initial point by any unit is the hour of its passage at the leading initial point decreased by a time interval corresponding to the distance between the two points.

When a unit marches in several columns, it may fix an initial point for the formation of each column or designate an initial line to be passed at a prescribed hour by a specified element or elements of each column (e. g., support of advance guard, head of main body, etc.). When an initial line is designated, each column commander fixes an initial point and hours of passage in such manner as to pass the initial line as prescribed in the orders of the higher commander.

When a unit moves in several columns echeloned on the same route, the unit commander regulates the start of each column by fixing its initial point and hour of passage, or by fixing the hour of its departure from the area which it occupies. In the latter case each column commander designates the initial point for the formation of his column.

Instead of fixing the hour of passage, orders may prescribe an hour of clearance for one or more units of a column. This procedure is often advantageous in the case of units or groupings (e. g., advance guards) having an exceptionally variable march depth; the required distance between them and the following elements can thus be more accurately established. Designation of hours of clearance may also be advantageous in the case of a command which marches in several columns on the same route.

299. Initial points should be located in the direction of the march of the troops in order that no unit may be required to move to the rear in joining the column. They should be easy to identify on the ground through some natural or artificial feature; at night special provision for identification is frequently necessary (lanterns, fires).

300. Initial points and hours of passage or clearance of the several elements of a command are stated in the march order or in a march table accompanying it.

301. Commanders of subordinate units of a march column consider the route to be followed in reaching the initial point, calculate the time required, and start their commands in such manner that there will be neither delay nor unnecessary waiting either at the initial point or elsewhere. They designate an initial point for the formation of their commands in column of route or assemble their units in an appropriate preparatory formation.

Ordinarily march units are the largest units which are assembled preparatory to a march; larger units usually form route column by a successive passage of their subordinate units at an initial point. Assembly of larger units may be made necessary by uncertainty in the tactical situation when marches are con-

ducted in proximity to the enemy. Such assembly is, when practicable, avoided on account of the resulting exposure to hostile aerial attack and reconnaissance.

The necessary measures are taken to insure the clearance of routes for the formation of the column. The movement of transportation between troop units and the rear is generally restricted to hours of repose of the troops. When field trains are sheltered with their units and are to join the tail of the column on the march, they are kept off the roads until the troops have cleared the routes; their assembly on the route of march is so regulated as not to interfere with the movement of the troops.

302. Units which arrive at the initial point in advance of the time table halt until the hour fixed for their passage or clearance.

303. The start.—The hour to be fixed for the start of the march depends upon the situation, the length of the march, and the hour at which the troops should arrive at their destination.

When practicable, daylight marches begin at as early an hour as is consistent with allowing ample time after daybreak for the men to breakfast, animals to feed, and transportation to be loaded. An earlier hour may be designated when the distance to be covered would otherwise make it necessary for the troops to go into shelter after dark at the end of the march. The repose of foot troops ordinarily ceases about one hour, that of mounted troops about two hours, before the start of the march. The repose of mounted troops does not commence as soon as that of foot troops on going into shelter.

Units of the command which start at an exceptionally early hour avoid disturbing the repose of other troops by trumpet calls.

304. Rate and length of marches.—The rate of march of a column is influenced by the character and condition of the roads, the weather, the nature of the terrain, the condition of the troops, and the tactical situation.

It is essential to maintain a uniform rate of march throughout the column. In each march unit, the leading guide under the direction of his commanding officer regulates the gait in accordance with instructions issued for the march. When the leading units encounter conditions requiring a change in the rate of march, timely notification is given to the units in rear.

The average rate of march of columns is as follows:

Infantry or mixed columns consisting partly of foot troops, 2¼ to 2½ miles an hour. Columns of the size of an infantry division average about 12 miles, smaller columns about 15 miles, a day. These distances can be increased with well-seasoned troops marching on good roads in favorable weather. The march capacity of infantry is greatly increased by providing transportation for the packs.

Cavalry, 3½ to 6 miles an hour. The usual gait on fair roads is the walk and trot, about half and half. Cavalry walks 3¾ miles an hour and trots 8 miles an hour. Except in emergencies, unseasoned mounts or troops do not march more than 12 to 15 miles a day. Seasoned cavalry averages 25 miles a day.

Horse-drawn artillery, 2½ to 3½ miles an hour; with seasoned horses, 15 to 25 miles a day.

Tractor artillery has an average economical speed of about 3½ miles an hour. In an emergency, it can be forced to a rate of 7 miles an hour.

The rate of march of a wagon train varies with the class and condition of the draft animals, the load, and the length of the column. On good roads, long columns may attain a rate of 2½ miles an hour, short columns 3 to 3½ miles an hour. Daily march about the same as that of infantry.

Light motor columns on good roads, 14 miles an hour, 140 miles a day; heavy motor columns, 8 to 10 miles an hour, 80 to 100 miles a day.

On marches of more than one day's duration, the first day's march of unseasoned foot troops does not exceed 6 or 8 miles. The distance is progressively increased

1 to 2 miles a day up to the normal daily march of seasoned troops in order to accustom the troops to marching and carrying the pack.

305. The conduct of the march.—As far as practicable, troops, officers and their mounts, and vehicles keep to the right of the road, leaving the left free for passage of other traffic along the column. On muddy, sandy, or very dusty roads, troops may be directed to march on both sides of the road with a view to permitting men and animals to pick their way; the middle of the road is kept clear for other traffic.

In the case of heavy motor and tractor drawn columns, the nature of the road may make it necessary for the vehicles to utilize the middle of the road. Automobiles seeking to pass the column move in the intervals between vehicles and take advantage of favorable sections of the road to pass the preceding vehicles and work their way along the column.

306. Halts are made at regular intervals to rest the men and animals, to adjust equipment, and for other purposes. The schedule of regular halts is regulated by the march order of the commander of the column. Notification relative to halts not foreseen in the march order is conveyed to unit commanders during the course of the march with the least practicable delay.

The march units of a column halt and resume marching simultaneously, regulating the time by the watch.

A halt of 15 minutes is usually made at the end of the first 45 minutes of march for the purpose of permitting the troops to relieve themselves, adjust equipment, inspect loading, adjustment of harness, etc.

After the first halt, columns including foot troops usually halt 10 minutes each hour, mounted columns 5 to 10 minutes each hour. The halts of motor columns are regulated with reference to the location of water sources and the necessity for refilling with gasoline and water and making minor repairs and adjustments; halts for these purposes are usually made every two or three hours.

When the hour scheduled for a halt arrives, the commander of each march unit (see par. 293) halts the leading element of his unit. Each element of the march unit in rear of the leading element closes up to its normal distance and halts, units bearing toward the right of the road in halting.

Foot troops fall out; mounted men dismount; a driver places himself near the head of each team.

Shortly before the termination of the halt, the commander of each march unit gives the preparatory signal for the resumption of the march; foot troops fall in, mounted men remount, drivers resume their seats. Each unit moves out at the signal of execution of the march-unit commander.

307. It is generally desirable to finish the day's march as soon as practicable; long halts in the course of a daily march are not made unless special conditions require it. The length of the march or the desirability of avoiding excessive midday heat may, however, render it advantageous to make a halt varying in duration from one to four hours toward the middle of the day. Except for the purpose of avoiding excessive heat, long halts are not ordinarily made on marches of less than 15 miles for infantry and 25 miles for cavalry.

Columns execute long halts by units or groups which decrease their march depth and extend their frontage. Each unit or group moves to a previously reconnoitered location in proximity to the route of march. Mounted units are located near sources of water supply. Concealment from aerial observation is considered in selecting the locations for the halt.

308. Men are not permitted to fall out during the march or to leave the immediate vicinity of their unit during halts without the specific authority of an officer of their unit. An officer marches at the tail of each company; he is

charged with keeping the unit closed up and with preventing straggling from the column. He examines men who fall out on account of sickness or footsore condition; according to circumstances, he gives them a written permit to be presented to the surgeon or requires them to continue the march.

A guard marches at the tail of each regiment and separate unit; it has charge of the march of stragglers not admitted to the ambulance by authority of the surgeon.

Only one man besides the driver is permitted to ride on a field wagon except in cases where authority has been given for the use of field wagons for the transportation of the sick and disabled. All other men with wagon trains march in groups at the tail of the transportation unit to which they pertain (wagon section, battalion section of field trains).

Assistant truck drivers ride at the rear of the truck, not on the seat with the driver.

A repair truck marches at the rear of each motor transport company and deals with trucks which become disabled during the march.

A detachment of military police marches at the tail of the combatant troops of a division. It arrests all men found absent from their units without authority and except in cases of men apprehended for serious offenses turns them over to their units at the first opportunity with a statement of the circumstances of their apprehension.

309. The surgeon attached to a troop unit marches at the tail of the unit. He examines men authorized to await his passage by the officers of troop units; according to their condition, he gives them a permit admitting them to the ambulance or authorizing them to place arms and equipment (in whole or part) on the ambulance or other transportation provided for that purpose, or after treatment directs them to report to the guard at the tail of the regiment. One or more ambulances march at the tail of each regiment and similar unit for the transportation of men who become sick or disabled during the course of the march.

The march order of a division provides for one or more collecting points for sick and disabled along the route of march; ambulances halt at these points and discharge the sick and disabled and their arms and equipment.

The divisional veterinary service makes provision for the collection of animals which become sick or disabled in the course of the march. One or more collecting points are established along the route of march.

310. Obstacles, stream crossings, causes of delay.—Possible causes of delay in the march are, as far as practicable, eliminated by preliminary road reconnaissance, provision for stream crossings, and the timely removal of obstacles. When an unavoidable cause of delay is encountered, units in rear are notified as to the minimum length of the delay; they then conduct themselves as at regular halts.

A vehicle which for any reason is compelled to halt moves off the road or as far to one side of the road as practicable. Disabled vehicles are promptly removed from the road.

Special precautions are taken to avoid congestion and delay during the passage of points on the route which compel the column to march on a reduced frontage or otherwise delay the movement. The measures to be adopted vary with the nature of the obstacle. It will be frequently advisable to detail an officer with such assistants as may be necessary to supervise the passage of the column. His instructions relative to formation, rate of march, use of bridges, etc., are strictly obeyed.

In passing through a short defile requiring a temporary reduction of front, the leading unit increases its rate of march at a point sufficiently distant from

the defile to avoid delaying the march of following units; the leading element of the unit maintains the increased rate and reduced frontage until the rear of the unit has cleared the exit of defile; other elements until normal frontage has been resumed. Points where changes of rate and formation are to take place are indicated by the supervising officer.

When long columns must continue to march on a reduced frontage for a prolonged period, new march tables are computed for the rearward units, taking the point where the reduction of the front becomes necessary as the initial point and basing the computation on the increased march depth of the several units.

Fordable streams may be crossed at several points; if a unit becomes extended during the crossing, the head of the unit slackens pace or halts a short distance beyond the crossing until the entire unit has passed and has closed up; it then regains its distance, increasing the pace if necessary.

311. Careful examination is made of fords, bridges, ice, etc., before attempting a stream crossing.

Foot troops crossing bridges march without cadence. When necessary, heavy vehicles cross at increased distances.

In crossing a military bridge, the instructions of the engineer bridge guard relative to the use of the bridge are strictly obeyed. In crossing a pontoon bridge, cavalry dismounts; in columns of twos, troopers march on the outside of the horses. Teams in front of the wheel team of any vehicle are led by the bridle.

In crossing streams by ferry, men enter the ferry at the bow or stern and gradually move toward the stern or bow in a formation adapted to the size of the vessel (column of files, twos, or fours). They retain the places assigned to them so as not to interfere with the handling of the boat and stand or sit as directed. When there is room for a single row only, horses alternate heads and tails; if there is room for two rows, they face inward. Guns, caissons, and wagons are usually loaded on small ferries by hand; if practicable, they are loaded on the same ferry with their teams. Vehicles are blocked or secured by locking brakes. In unloading, points of debarkation are promptly cleared.

Infantry and cavalry may be ferried in pontoons and small boats. Infantry removes equipment when there is danger of capsizing. Horses cross the stream by swimming.

When rafts are used, the center is occupied first, and the load is then uniformly distributed. Unloading takes place in reverse order, the center of the load being unloaded last.

In fording a deep stream with a strong current, foot troops cross on as broad a front as possible, the men marching abreast and holding hands. They do not look at the water but at the opposite bank. If the ford is broad enough, mounted troops may cross at the same time on the upstream side, thus breaking the force of the current. The crossing of many animals or wagons may deepen a ford and render it impassable; new crossings may thus become necessary.

When roads lead through swamps or quicksand or across streams with treacherous bottoms, the limits of the road are marked or warnings placed at dangerous points. At night, lanterns are hung from stakes, and a fire is built or a lantern hung to mark the landing.

312. When several elements of a command marching by different routes are to unite on a single route or when their routes of march cross each other, arrival at or clearing of the road junction should, in principle, be so timed as to prevent collision between columns.

When a crossing of two columns can not be avoided, the higher commander regulates the crossing so as to reduce to a minimum the delay in the march of both columns. This may be accomplished by alternating the crossing of a point of intersection by successive units of each column (e. g., battalions, squad-

rons), which take up an increased march rate and a broader formation (e. g., double column of squads, double column of vehicles). Measures are taken to prevent congestion of the roads beyond the points of crossing of the columns; units do not resume normal march formation until they have cleared the crossing by a distance at least equal to their reduced march depth; the leading elements do not resume normal march rate until normal depth has been reestablished.

When an unforeseen crossing of the routes of two columns occurs, the senior commander regulates the crossing, basing his action on the situation and the missions of the two columns.

313. Care of troops, animals, and transportation.—Special attention to the care of troops and the means of transportation is essential to successful marching. Commanders take the necessary measures prior to a march to place men, animals, and transportation in the best possible condition and exercise the necessary supervision during the march to maintain them in that condition.

Before beginning a march, men are carefully fitted with socks and shoes. Until the troops are hardened to marching, company officers of foot troops, when practicable, personally examine the feet of their men at the end of each day's march; feet are bathed, abrasions and blisters dressed, and the necessary changes made in footwear.

Detailed attention is given to adjustment of packs and equipment. The backs and shoulders of animals are, when practicable, inspected at intervals during the march, and the necessary remedial measures are immediately applied. On going into shelter, the care of animals is given first consideration when the tactical situation permits. Transportation is kept in good condition by constant care on the road and thorough cleaning and overhauling in shelter.

Care is exercised to prevent men from obtaining unwholesome beverages, food, and fruit from local sources and from indulging in excessive eating and drinking. The consumption of water during a march is largely a matter of habit. Men are encouraged to drink all the water they need before starting a march; they are cautioned to drink as little water as possible during the course of the march. An occasional swallow is sufficient; the drinking of considerable quantities, especially in hot weather, creates a craving for water that can not be satisfied during the march. The eating of sweets greatly increases thirst.

Commanders make the necessary arrangements for the replenishment of canteens when favorable opportunities are offered; they do not permit straggling from the column for this purpose. In large commands, replenishment of canteens is often impracticable; troops therefore exercise economy in the use of water in order to make the supply in the canteens suffice for the day.

Sources of water supply are examined by experts and marked good or bad. This measure is imperative in countries infected with water-borne diseases. If water is bad or water sources insufficient, a supply is carried in water carts, wagons, or trucks.

Animals require 5 to 15 gallons of water daily. If insufficiently watered, they rapidly lose condition. The more frequently they are watered the better, but the times of watering are largely dependent upon march conditions and available facilities. When the march commences in the morning, animals are watered before starting unless facilities and time permit watering an hour or two after starting; in cold weather, animals do not readily water in the early morning. Delay is avoided by watering as many units as possible at the same time and assigning different watering places to the several units. The animals of artillery and wagon trains are watered from buckets or by unhitching and riding or leading to watering places.

Hot weather is one of the greatest sources of hardship on a march. Every precaution is taken to prevent suffering from this cause. Places for long halts are, when practicable, selected where there is shade and free circulation of air.

Packs carried by troops are lightened when transportation is available for that purpose.

Troops are not kept in column or under arms longer than necessary. The exercise of foresight, thoughtfulness, and good judgment does much toward mitigating the discomforts, annoyance, and hardships of marching.

314. Marches in proximity to the enemy.—The order of march of a column of all arms advancing against the enemy is dependent upon the tactical situation and the mission of the column. When contact with the enemy is possible, the order of march is adapted to the probable order of intervention of the several elements in combat.

It is important to bring the enemy under artillery fire at the earliest practicable moment and to insure adequate artillery support of our own infantry. The mass of the artillery therefore usually marches near the head of the main body; considerations of its security generally require it to be preceded by one infantry unit (battalion or regiment). The removal of obstacles to the cross-country movement of artillery and infantry units requires the presence of an engineer unit near the head of the main body. A signal corps unit usually marches at or near the head of the main body in order to furnish reliefs for detachments engaged in line construction and to be in a position promptly to establish a message center when required.

Combat trains march with their units. Field trains are assembled and usually march in rear of the combatant elements of the main body in the order of march of the units to which they pertain. When combat is imminent, the field trains may be preceded by certain elements of the service trains urgently required in battle (elements of ammunition supply column, engineer train, medical units).

315. Forced marches.—Forced marches seriously impair the fighting power of even the best troops. They should, therefore, be undertaken only in cases of urgent necessity; requirements for increased rates of movement should, wherever practicable, be met by the use of rail or motor transportation.

316. The conduct of forced marches is governed by the requirement that the completion of the march must find the troops in condition to accomplish the object of the movement.

317. The difficulty of execution increases with the size of the command and the length of the march.

It is especially desirable in the case of a forced march to constitute march columns in accordance with march rates, and to conduct the march in smaller units or with increased distances between the units of the march columns. The practicability of employing these means for facilitating the march will be determined by the extent to which tactical union of the several elements is required during the course of the march.

318. The march capacity of infantry is, as a rule, increased by increasing the number of marching hours; the hourly rate of the infantry of a large unit can, as a rule, be efficiently increased only when the march is conducted in smaller units or when transportation is available for carrying the packs.

The march is broken into shorter stretches by halts of several hours' duration.

The time which infantry requires for the execution of a forced march runs in an increasing ratio with the distance to be marched. While seasoned infantry may be expected to cover a maximum distance of from 25 to 30 miles in a period of 15 to 18 hours (including a long halt), a distance of 50 to 60 miles requires a period, including halts, of from 48 to 60 hours. A longer forced march practically becomes a succession of daily marches of more than average length.

Mounted troops usually maintain the normal hourly rate and alternate changes in gait and leading. Long halts are interposed during which horses are unsaddled and permitted to roll, feed, and lie down.

Including halts, a cavalry division may, under favorable conditions, be expected to cover in 24 hours 60 to 75 miles; in 48 hours, 90 to 125 miles.

319. Night marches.—The requirements of forced marches, the necessity for concealment of a movement from the hostile air service, and the importance of effecting an approach to hostile forces under the cover of darkness frequently lead to the execution of a march by night. Night marches may also be made for the purpose of avoiding the excessive heat of the day.

320. Night marches are carefully prepared. The route is, whenever practicable, reconnoitered prior to the commencement of the march.

Special precautions are taken to insure the maintenance of direction. Guides are furnished when available. Routes are marked, men are stationed at cross-roads and in towns to prevent the wrong route from being taken, numerous connecting files are provided.

In movement off roads, the routes are laid out by compass bearings and the march is directed by means of luminous compasses. The movement is usually executed by bounds with short halts on definite terrain lines.

321. In night marches when protection must be provided against the reconnaissance or attack of hostile airplanes making use of flares, special precautions are necessary. When practicable, the command marches in small units or with increased distances between units; when a unit is illuminated it halts and remains motionless. Shaded lights only are permitted to be used by troops and vehicles. When troops are being concentrated by night marches, daybreak should find the troops either in position or in concealed localities (woods, villages) and the trains under cover.

322. When practicable, foot and mounted troops march by separate routes; when they move by the same route, cavalry and light artillery usually follow the infantry, starting at a later hour.

323. Cross-country marches.—Cross-country marches may become necessary incident to development and approach march preliminary to battle, or to the extension of a command for the purpose of diminishing its vulnerability to aerial attack.

324. Reconnaissance of the terrain included in the zone of march of the command is executed for the location of cross-country routes. Basic factors in the location of routes are practicability of the terrain and the location of cover, obstacles, and the objectives of the march.

325. The cross-country routes thus reconnoitered and the roads at the disposition of the command constitute a network upon which the distribution of zones or routes of advance to subordinate units may be based.

326. Distribution of zones or routes to subordinate units is determined by the situation and the adaptability of the several elements of the command to cross-country movement.

Infantry, light vehicles, cavalry, and light artillery constitute the elements of a large unit most capable of cross-country movement.

Heavy vehicles, medium and heavy artillery, are assigned to the roads.

Both the units of the columns marching on the roads and those marching across country march with considerably increased distances.

327. When the enemy is distant, columns are, as far as practicable, composed of elements having the same mobility. The number of columns is determined by the number of routes which readily lend themselves to cross-country movement and the desired depth of dispositions.

In proximity to the enemy, tactical considerations determine the composition and the number of columns. (See par. 290.) The increased breadth of dispositions generally requires the utilization of all practicable routes.

328. The rates of march are extremely variable; the varied nature of the terrain and the variable time required for the removal or passage of obstacles produce irregularity in the rates of movement of the different columns.

Inequality in the advance of the several columns is, when necessary, avoided by regulating the movement by bounds. The location of terrain lines affording cover from aerial observation largely determines the length of the bounds.

Congestion is avoided by timely communication by the leading units of delays encountered in their movement.

329. Except when the terrain is unusually favorable to cross-country movement, the purposes of protection against hostile aerial attack are generally better met by night marches than by an extension involving cross-country movement. Night marches also more effectively screen a movement from hostile aerial reconnaissance. Daylight marches are, however, frequently unavoidable in approach to the battle field. (See par. 388.)

MOVEMENTS BY MOTOR TRANSPORT.

330. Organization.—Motor transportation for the movement of troops is supplied by army and corps trains and by especially organized units of the communications zone.

The organization of motor transport units for the purposes of troop movements is based upon the tactical organization of the troops. The basic unit is designed for the transportation of an infantry battalion; it is adaptable to the transportation of other troop units.

331. In large motor transport movements, special road circuits are reserved for the execution of the movement. Reserved routes are operated under the control of the motor transport service. Military police are assigned for the enforcement of traffic control. The roads are divided into sections each under the control of an officer with the necessary assistants. The officer in charge of a section insures that the route is kept open for the movement of the columns and that all obstructions are removed. Reserved routes are conspicuously posted.

332. Preparation.—Large units of the general reserve held in readiness for movement by motor transportation prepare plans for their movement under various assumptions as to the routes over which they may be dispatched.

333. The movement of a command by motor transportation is prepared by the location of a suitable number of entrucking points for the several units of the command. The order of succession of the several elements of a motor transport column on the route of movement is regulated by designating an initial point and fixing the hour at which each element shall pass it.

The hour at which each unit begins entrucking is the hour of its passage at the initial point diminished by the time required for entrucking and a time interval corresponding to the distance between its entrucking point and the initial point.

The distribution and movement of the motor transportation to entrucking points is regulated by the establishment of a regulating point between the assembly point of the motor transportation and the entrucking area. A motor transport officer at the regulating point routes motor transport elements to the entrucking points of the troop units to which they are assigned.

334. The orders of the headquarters directing the movement of a unit by motor transportation indicate the transportation available for the movement, the time and place at which it is to be made available, and the routes and the destination of the movement; when necessary, they indicate the elements which are to be transported and those which are to move by marching and the matériel

to be transported with the troops; they provide for the designation of a motor transport officer in charge of the transportation and direct him to confer with the unit commander with reference to the detailed arrangements for the movement. The necessary instructions are given to commanders concerned relative to the clearance of routes during the period of the movements.

In conjunction with the motor transport officer in charge of the transportation, the unit commander locates the entrucking points for the various units of his command and prepares a movement table regulating the entrucking and movement of the troops.

The movement table enumerates the units to be moved, assigns entrucking points to each unit, fixes the hour at which the entrucking of each unit begins, designates an initial point on the route of the movement, specifies the hour at which each unit will pass or clear it, and states the order of clearance of the initial point.

The distribution of motor transport units and their movement to entrucking points may also be regulated by the movement table of the troops.

335. Entrucking points are so located as to be of convenient access to the troops and to afford a continuous circuit to motor transportation from the regulating point to the initial point of the movement.

336. Entrucking.—Troops are marched to entrucking points in time to insure prompt loading of personnel and matériel. Troop units are distributed to motor transport units; truck-load groups are told off, assigned to trucks, and conducted to trucks by assistant truck drivers. The men enter the trucks from the rear and place packs and equipment under the seats. The time required for the entrucking of a unit is about 15 minutes. In time calculations, a more liberal allowance should be made (25 to 30 minutes).

Designated details load matériel on trucks assigned for that purpose. The shafts of the carts of machine guns and infantry cannon are removed before loading. Rolling kitchens and artillery vehicles are loaded by means of a ramp. All loading equipment is furnished by the motor transport service.

337. Execution of the movement.—Each motor transport element leaves its entrucking point in time to arrive at the initial point at the hour fixed in the movement table.

338. The movement of the motor transport column is controlled by the motor transport officer in command of the column. The commander of the troops exercises no control over the operations of the column except in a tactical emergency.

339. Motor transport columns run on a prescribed schedule. The average running rate of columns during daylight is from 6 to 9 miles per hour depending upon the type of truck employed and the character of the road. On dark nights the average rate varies from 3 to 5 miles an hour. Stops of 10 minutes each are made at intervals of about 3 hours to allow the men to relax and to permit inspection of motors and refilling with water.

In large motor transport movements over reserved roads, the regulation of the movement is assimilated to that of railway trains. Columns pass successive designated points along the route of movement at hours fixed by a time-table.

340. Detrucking.—When arrangements have not been made for the distribution of troops in the detrucking area in advance of the troop movement, representatives of the command and of the motor transport service are sent to the detrucking area in advance of the arrival of the troops. They locate detrucking points in accordance with the contemplated distribution of the troops and establish a regulating point on the route of movement on the side of the detrucking area from which the motor transport columns are due to arrive. On arrival at the regulating point, motor transport elements are routed to the detrucking points assigned to the units they transport.

Detrucking points are located in accordance with considerations similar to those governing the location of entrucking points. They should afford motor transport elements a continuous circuit in the direction of their movement after completion of detrucking so as not to compel vehicles to turn about in the road.

341. The necessary measures are taken for security when the troops are to be detrucked in proximity to the enemy. A unit of the required strength is sent ahead as a security detachment to cover the detrucking of the command.

MOVEMENTS BY RAIL.

342. Organization.—The organization of the rolling stock at the disposition of the commander of a theater of operations for the purposes of troop movements varies with the character of the rolling stock available and facilities of the railroad lines for the execution of the movements. The length of trains is limited by the tractive effort which can be furnished by the available motive power, the nature of the roadbed, and on single-track lines the length of sidings available for the passage of trains.

Simplicity in arrangements for troop movements is furthered by organizing the available rolling stock into standard trains of uniform composition. The familiarity of troops and railway personnel with the composition of the trains facilitates the formation of trains, the organization of troops for entrainment, and the distribution of trains to subordinate units.

As far as permitted by considerations of traction, length of sidings, etc., the organization of standard trains is based upon tactical organization. It will generally be advantageous to base the composition of the standard train upon the unit which in each arm of the service corresponds most closely to the train capacity as fixed by limitations of traction; in the infantry, the battalion, including its combat train; in the artillery, the battery plus an echelon of the combat train. Trains of an especial composition are usually required for the transportation of tractor artillery, air service units, and tanks. The entrainment of other units can be adapted to the composition of the standard train.

The loading of a standard train in accordance with the above principles requires the maximum exploitation of the capacity of the rolling stock. When standard trains are employed in long-distance movements, as for example in the transfer of troops to a distant theater of operations, it will sometimes be advisable to reduce the density of loading with a view to diminishing the discomfort suffered by the troops.

Special considerations (e. g., character of rolling stock, roadbed, length of sidings) may lead to the composition of trains in accordance with different principles.

343. The composition of standard trains usually includes box cars for the men, supplies and equipment, box or stock cars for animals, flat cars for vehicles, a box car for use as a kitchen car, a coach or box car for officers, and a caboose for railway personnel.

344. Time calculations.—The rapidity with which troops can be transferred from one area to another is dependent upon the number of railway lines available for the movement and the density of train circulation over each line.

Density of train circulation over a railway line is expressed in terms of the number of trains moved in a period of 24 hours. The normal minimum time interval between successive trains of about 20 minutes determines a maximum density of train circulation of 72. Other considerations (e. g., entraining facilities, number of entraining stations, railway operative limitations) usually reduce this theoretical maximum to a much lower figure.

The number of entraining stations required to establish any desired density of circulation is dependent upon the time required for the loading of a train at

each entraining station and varies with the available loading facilities and the character of the matériel to be loaded. If, for example, facilities of entraining stations permit of the loading of a train in a period of 3 hours, 8 trains can be dispatched from each station in a period of 24 hours; to establish a density of circulation of 24, 3 entraining stations would be required.

The density of circulation will, however, frequently be limited by the number of entraining stations available.

It is frequently advisable in the interest of elasticity to leave open a limited number of train schedules in order to allow for unforeseen delays.

345. The time interval in days between the start of the first and last train transporting a unit is equal to the total number of trains required for the transportation of the unit divided by the density of circulation. The total time required for the transportation of a unit from one area to another is calculated by adding to this time interval the time required for the preliminary arrangements of troops and railway transportation prior to the loading of the first train, a time interval corresponding to the distance between the entraining and detraining stations of the last train, and the time required for unloading the last train.

346. Preparation.—Large units held in readiness for movement by railway transportation are distributed into transportation groupings corresponding to the capacity of standard or special-type trains.

347. Orders directing the movement of a unit by rail generally designate the stations at which the entrainment of the unit will take place, indicate the number of train movements and the hours of departure, and state the detraining area or destination of the movement; the detraining stations may also be designated when these are definitely known and considerations of secrecy do not oppose. The movement is, however, frequently directed to a regulating station from which the several units are routed to detraining stations.

Instructions received by the commander of an army or a group of armies for the movement of units of their command may be limited to a statement of the units to be moved, the time when the movement is to commence, and the objective of the movement, leaving the designation of entraining stations, hours of departure, etc., to be arranged in conference between representatives of the railway transportation service and the commander of the troops.

348. In conjunction with a representative of the railway transportation service, the commander of the troops prepares a table regulating the entrainment and departure of the various elements of his command.

349. The order in which the troops of a large unit are dispatched varies with the situation.

When the movement is carried out in connection with the execution of a tactical mission, tactical considerations influence the priority in which the troops are moved. In movements which merely involve the transfer of a unit from one quartering area to another, the order of movement is chiefly influenced by considerations of supply, administration, and convenience.

Elements of signal corps, military police, medical units, and engineers are generally placed in an early position on the schedule of movement.

Field and combat trains usually move with their units.

The reestablishment of the functioning of the normal system of supply is facilitated by forwarding a part of the division supply column on the early railway trains.

Echelons of signal corps, military police, and medical units will usually be required in the old area until evacuation of the area is nearly completed. The movement of these branches of the service is regulated accordingly.

Quartering detachments are forwarded on one of the first trains when it has been impracticable to send them to the new area in advance of the troop movement.

350. The assignment of units to entraining stations is controlled by considerations of the loading facilities available at the several stations, the character of the matériel pertaining to the several units, the desirability of equalizing the number of trains leaving from each station, and the priority fixed for the arrival of the several elements of the command in the detraining area.

Units equipped with exceptionally heavy vehicles are assigned to stations provided with loading facilities adequate to the handling of the special matériel.

As far as practicable, other units are assigned according to their accessibility to entraining stations and with a view to equalizing as nearly as possible the number of trains leaving from each station. The priority fixed for the arrival of the several elements of the command in the detraining area may, however, require the assignment of a unit to a station other than the one most accessible to it.

351. The order of entrainment of the several transportation groupings (see par. 346) at each entraining station is fixed in accordance with the priorities established for the arrival of the several elements of the command in the detraining area. So far as is consistent with these priorities, it will usually be advantageous to regulate the order of entrainment in the order of the proximity of units to the entraining stations.

352. Entrainment.—An officer is detailed in charge of each entraining station. He supervises the entrainment and police at the station and is furnished with the necessary guard, transportation, and other assistance.

Each unit ordinarily furnishes the details required for the loading of its own equipment. In special cases, details may be made for loading the equipment of all units leaving from the same entraining station.

353. Each unit moves to its entraining station in time to complete its entrainment before the scheduled hour of departure. Movement of units to entraining stations is so regulated as to avoid congestion at the entraining station.

The commander of each transportation grouping furnishes the representative of the railway transportation service at the entraining station with a statement showing the number of officers, men, horses, mules, vehicles by type, and the amount of baggage to be transported on his train.

354. The commander of the transportation grouping causes the cars to be numbered in serial order, beginning at the head of the train. He then prepares a list showing the number of each car and the purpose to which it is assigned.

Methods to be employed in the loading of animals and different types of vehicles are indicated in special regulations.

Troops are formed in the vicinity of the railroad station, carload groups are told off and assigned a car number, a noncommissioned officer is placed in charge of each group, and the command is marched to the train. Each carload group halts in front of the car to which it is assigned; the noncommissioned officer in charge regulates the boarding of the car and the distribution of the men.

355. Execution of the movement.—The commander of the troops details a guard which is usually assigned to the car next to the officers' coach.

The commander of the troops is responsible for the maintenance of order, but exercises no control over the operation or movement of the train. The noncommissioned officer in charge of each car is responsible for the maintenance of order in his car; he does not permit soldiers to leave the train without authority or ride on the top of the car.

356. Detrainment.—A representative of the command and an officer of the railway transportation service proceed to the detraining area in advance of the troops or arrive on the first train of the troop movement. The representative of the command determines the distribution of the troops in the detraining area in accordance with the commander's instructions, and in conjunction with the

representative of the railway transportation service locates the detraining stations for each transportation grouping and prepares a detraining table. When the movement is not directed on a regulating station already in operation (see pars. 609–615), they establish a regulating station on the side of the detraining area from which the troops are due to arrive. The representative of the railway transportation service gives the necessary instructions to the railway personnel for routing each train to its detraining station. As each train arrives at the regulating station, the representative of the command gives the commander of the troops an extract of the detraining table pertaining to his unit and such other instructions as may be required.

CHAPTER X.

SHELTER.

GENERAL PRINCIPLES.

357. Good shelter contributes greatly to the maintenance of the efficiency of troops in the field.

The character of the shelter is determined by the special conditions existing in each situation. The underlying principle is to utilize the best available facilities for shelter so far as is consistent with the situation, and to improve existing facilities to the extent permitted by prevailing conditions.

358. According to circumstances, troops in the theater of operations are sheltered in bivouac, camps, or billets.

359. Troops are in bivouac when resting on the ground covered only by shelter tents or hastily improvised shelter, or without any overhead cover. Bivouac facilitates tactical control and readiness for action. It is, however, undersirable from the viewpoint of comfort, rest, and protection from the weather and is therefore resorted to only when required by tactical conditions. In proximity to the enemy, the tactical distribution of the troops imposed by the situation and the necessary degree of readiness for action generally require the use of bivouacs. Large temporary concentrations in the areas in rear of a battle front also frequently make it necessary to bivouac a large proportion of the troops on account of the inadequacy of other forms of shelter.

360. Troops are in camp when sheltered by tentage other than shelter tents (tent camps) or quartered in huts or other temporary structures especially constructed for military purposes (cantonments). Camps facilitate control of the troops and administration but are not practicable for the shelter of units engaged in active operations; their use in the theater of operations is for the most part restricted to the communications zone. In stabilized situations they may also be used to a limited extent in the rear areas of the combat zone. On account of the mobility of tentage, the use of tent camps is advantageous for the purposes of temporary shelter; where the camp site is to be used for a prolonged period for the shelter of troops, cantonments are more economical than tent camps on account of the rapidity with which the tentage becomes unserviceable.

361. Troops are in billets when occupying private or public buildings not especially designed for military purposes. Billeting in dwellings in the United States and its possessions is limited by the third amendment to the Constitution, which provides that "no soldier shall, in time of peace, be quartered in any house without the consent of the owner; nor in time of war, but in a manner to be prescribed by law." Use may be made of public buildings when available, or private buildings may be rented. In enemy territory billeting is resorted to when shelter of this character is most advantageous in the particular situation. Families are not removed from their dwellings when it can be avoided. In the territory of an ally the billeting of troops is governed by the laws and customs of the allied country. Billets afford excellent shelter and permit of the screening of troops from aerial observation; they have, moreover, the advantage of offering an immediately available form of shelter which does not require an expenditure of labor or material. Where billeting is permissible, use may be made of billets for quartering troops not in close proximity to the enemy. Billets do not, however, favor a high degree of readiness for action, and the tactical situation usually renders their use inadvisable in close proximity to the enemy. The danger of

the transmission of disease inherent in billeting requires careful inspections and strict enforcement of sanitary rules. Insufficiency in billeting space frequently results in a combination of billets with other forms of shelter (close billets).

362. Arrangements for sheltering troops are, as far as practicable, made before their arrival. The preparations for quartering a command are made by means of quartering parties composed of a staff officer of the command with the necessary assistants, a medical officer, and representatives of the several units. The staff officer of the command is the chief quartering officer. The duties of quartering parties are to select the quartering area when this has not already been determined and make arrangements for its occupancy with the proper authority; to apportion the area to the subordinate units and allot to each the available facilities for its administration and supply, subject to the approval of the area commander; to reserve facilities for the general service of supply, administration, and command (headquarters, infirmaries, message centers, guards, etc.); in general, to take the necessary measures to assure that all agencies of command, administration, and supply continue functioning with the least possible interruption after the arrival of the troops.

SHELTER DURING AN ADVANCE (RETREAT).

363. The distribution of troops in shelter conforms to the requirements of the situation.

When troops on the march go into shelter at such distance from the enemy that the possibility of contact with the hostile forces is eliminated, march considerations and the comfort of the men govern the distribution of the troops. Large units are distributed over a depth in shelter roughly equivalent to their march depth, and the troops are sheltered in as close proximity to the route of march as practicable. According to circumstances, units are distributed in depth in the order in which they were disposed in the march column or in the order of the next succeeding march. The distribution in depth enables units to take best advantage of facilities for shelter and greatly facilitates the service of supply. Field trains may be quartered with their units.

When contact with the enemy is probable, tactical considerations govern the distribution of the troops. Large units are distributed over the entire width of their zones of march, and the depth of shelter areas is correspondingly reduced. The echelonment in depth of the several arms of the service corresponds to the order in which they are disposed for battle. The infantry of the outposts occupies the most advanced areas. Infantry of the main body covers the artillery. Service trains occupy the most rearward quartering areas. The headquarters of the larger units are located as close as possible to the principal routes.

364. Instructions of the division commander regulate the transition from march column to shelter by assigning shelter areas to groups of a designated composition. The composition of the groups is determined by the tactical situation, considerations of tactical unity, and the shelter requirements of the various arms of the service. Antiaircraft artillery is assigned to groups in accordance with the relation of their areas to the general plan of antiaircraft defense as regulated by higher commanders. Orders for the occupation of shelter are issued in time to assure that no unit is compelled to march to the rear to reach its shelter area. Quartering parties are therefore given early instructions in order that they may commence their reconnaissances at an early moment. Assignment of areas may be made prior to the commencement of the march, in which case quartering parties proceed separately to their assigned areas. When the assignment is to be made during the course of the march, quartering parties frequently march assembled at positions in the column from which they can be sent for-

ward in advance of their units for the reconnaissance of their areas. When troops go into shelter after development for action, unit commanders personally reconnoiter their assigned areas.

In the assignment of areas, due consideration is given to the situation and the peculiar requirements of the several arms of the service.

365. The senior officer of each group is the area commander. He is responsible for the reallotment of the area to subordinate units, its local security, antiaircraft defense, administration, the establishment of signal communications within the area, and the readiness for action of subordinate units. He prepares the necessary instructions for the execution of these responsibilities.

366. The area commander details a guard under charge of a designated field officer of the day who is responsible for the execution of the measures prescribed by the area commander for local security, antiaircraft defense, counterespionage, police control of the inhabitants, and traffic regulation.

Detachments of the guard are posted so as to bar all routes of possible hostile approach. In cases where outposts have not been established by the higher command, the group occupying the most advanced area usually establishes outguards well to the front of its area. (See par. 248.)

Detachments armed with automatic weapons are posted with a view to affording protection against low-flying hostile aircraft. Other posts are established for enforcement of the regulations relative to traffic control, police, use of lights, movements of civilians, etc.; patrols are also detailed for these purposes.

All posts of the guard are charged with notifying the main post of the guard or with giving the prescribed alarm signal in case of hostile attack, the approach of hostile aircraft, or of gas attack.

In hostile territory special security measures are often necessary (stronger guards, detail of bridge and railway station guards, searching houses for telephone and wireless installations, holding of hostages, closing of roads to all except military traffic, etc.).

367. In each company and similar unit and larger units, one officer and, in each platoon, one noncommissioned officer are constantly on duty.

The area commander designates a rallying position and the route thereto for each subordinate unit in case of hostile attack. The commander of each subordinate unit designates an assembly place for the formation of his unit based on the location of the rallying position assigned to it. Rallying positions and the routes thereto are so assigned that units do not cross each other's paths.

In proximity to the enemy, each unit must be in such state of readiness for action that it can prepare to move on the shortest possible notice. Men sleep fully dressed, arms and equipment close at hand; in threatening situations it may be necessary to keep horses saddled and teams harnessed.

368. In bivouac, concealment and irregular distribution of units is necessary for the protection of the troops against hostile aerial reconnaissance and bombardment. Concealment is best secured by bivouacking in wooded areas; measures are taken to prevent betraying the location of bivouacs through the formation of paths. Trenches may be necessary for protection against the effects of bombardment. Special attention is devoted to the screening or camouflage of vehicles.

369. The quarters of the area commander are so located that they can be easily found; at night, they are marked by a shaded lantern. All sentries are instructed as to the location of the commander's quarters, and the route thereto is indicated by direction signs posted on the nearest road.

SHELTER IN THE COMMUNICATIONS ZONE.

370. When areas in the rear of the zone of active operations are successively occupied by different units, a permanent organization for the administration of

the several areas is usually established. Permanent area and subarea commanders are appointed and are furnished with the necessary assistants. They prepare standing orders governing the administration of their areas under the direction of the commander of the communications zone. Commanders of units occupying the areas are subject to the standing orders of the area.

In stabilized situations, the rear areas of the large units in line may be administered under a permanent organization similar to that described for the communications zone.

THE SELECTION OF CAMP AND BIVOUAC SITES.

371. The general location of camps and bivouacs is determined by service requirements. A camp or bivouac must be located with reference to the main objectives of the troops. Within the limitations fixed by these objectives, every possible consideration is given to the requirements of sanitation, administration and supply, and the comfort of the troops.

372. The following sanitary considerations are of especial importance:

Drainage.—The site should be sufficiently high and rolling to drain off the storm water.

Dryness.—Porous soil covered with stout turf and underlaid by a gravelly or sandy subsoil is best; a clay subsoil is usually damp and impermeable. Alluvial soils, marshy ground, and ground near the foot of a range of hills are usually damp. Dry beds of streams are subject to sudden freshet.

Freedom from sources of infection.—The available water supply should be free from contamination; the proximity of marshes or stagnant water is undesirable on account of mosquitoes and the diseases which they transmit; old camp sites are often permeated by elements of disease which persist for considerable periods.

373. Considerations of convenience of administration and supply include the following:

Convenience of the site to an abundant water supply.

Adequacy of roads leading to the camp and of necessary communications within the camp.

Ready availability of wood, forage, straw, and other supplies.

374. Comfort of the troops is promoted by selecting a shelter area large enough for their accommodation without crowding and affording means of interior communication without compelling the troops of one unit to pass through the area of another; in hot weather, selecting a site shaded by trees, free from underbrush and sufficiently high to obtain the benefit of prevailing breezes; in cold weather, locating the site on ground sloping to the south or with woods to break the north wind.

SANITATION.

375. Immediately on going into shelter, guards are posted to enforce the proper use of the water supply. Places are designated for obtaining drinking and cooking water, for watering animals, for bathing, and for washing clothes. If the water supply is obtained from a small stream, these places are designated in the order stated, beginning upstream. The water supply furnished by small streams may be increased by building dams; springs may be dug out and lined with stones, boxes, or barrels. Surface drainage is kept out by a curb of clay.

Water not known to be pure is chlorinated or boiled, then cooled and aerated.

376. Camps are kept in thorough police at all times. They are policed daily after breakfast, and all refuse matter is buried or burned. Tent walls are raised, and the bedding and clothing are aired daily, weather permitting.

377. Immediately on going into bivouac, latrines are constructed; this is a measure of fundamental sanitary importance, since the most serious epidemics in the field are spread from human excreta, by carriage of germs of disease from

them by flies, or by pollution of the water supply by drainage into it. Latrines for the men are always located on the opposite side of the camp or bivouac from the kitchens, generally one for each company unit and one for the officers of a battalion or similar unit. They are so sited that the drainage can not pollute the water supply or the shelter area. When a bivouac is occupied for one night only, straddle trenches suffice. In camps and in bivouacs of longer duration, when it is not possible to provide latrine boxes, deeper trenches are dug. They may be used as straddle trenches or seats may be improvised. When open trenches are used, the excrement is kept covered at all times with a layer of earth. In camps, the trenches are suitably screened, and are not over 2 feet wide, 6 feet deep, and in length proportionate to the strength of the organization using them. The number of seats, when practicable, is one-tenth of that of the strength of the command. At least 20 inches of running trench is allowed for each seat. When practicable, seats with lids are provided and covered to the ground to keep flies from reaching the deposits; urinal troughs discharging into trenches are provided. Each day the latrine boxes are thoroughly cleaned outside by scrubbing and inside by applying, when necessary, a coat of oil. The pit is sprayed with oil or burned out daily. When filled to within 2 feet of the surface, latrines are discarded, filled with earth, and their position marked. Urinal tubs may be placed in the company streets at night amd emptied after reveille.

In evacuating a shelter area, the site is thoroughly policed, fires put out, and latrines and kitchen pits covered.

CHAPTER XI.

COMBAT.

GENERAL PRINCIPLES.

378. The ultimate objective of all military operations is the destruction of the enemy's armed forces by battle. Decisive defeat in battle breaks the enemy's will to war and forces him to sue for peace.

379. Concentration of superior forces, both on the ground and in the air, at the decisive place and time, creates the conditions most essential to decisive victory and constitutes the best evidence of superior leadership.

380. Decisive results are obtained only by the offensive. Only through offensive action can a commander exercise his initiative and impose his will on the enemy.

A defensive attitude is never deliberately adopted except as a temporary expedient or for the purpose of economizing forces on a front where a decision is not sought in order to concentrate superior forces at the point of decisive action.

381. Numerical inferiority does not necessarily commit a command to a defensive attitude. Superior hostile strength may be overcome through greater mobility, higher morale, and better leadership. Superior leadership often enables a numerically inferior force to be stronger at the point of decisive action.

A strategically defensive mission is frequently most effectively executed through offensive action. It is often necessary for an inferior force to strike at an early moment in order to secure initial advantages or to prevent itself from being overwhelmed by a growing superiority in the hostile forces.

382. All combat action must be based upon the effect of surprise. Surprise takes the enemy in a state of moral and material unpreparedness, prevents him from taking effective countermeasures, and often compensates for numerical inferiority of force. Surprise is sought not only in the initial stage of action and by the larger units but also throughout the action and by units of every echelon of command. The principle of surprise applies to fire as well as to movement.

The effect of surprise is dependent upon rapidity of maneuver, the efficiency of counterinformation measures, and the effectiveness of the means employed to deceive the enemy as to our own dispositions and intentions.

By feint and demonstration, the attacker attempts to mislead the enemy as to the time and place at which the principal effort is to be made. Attacks designed merely to hold the enemy along a certain portion of the front are so made that they can not be distinguished from the principal effort and that the enemy is compelled to commit the largest possible proportion of his forces to meet them. Provision is made for exploiting success wherever attained.

The defense seeks to attain the effect of surprise through concealment of the location of its principal defensive works and its reserves so that the enemy will encounter resistance where he does not expect it, fall under the surprise fire of unlocated defensive elements, and expose himself to the action of the counter-attack. Provision for counteroffensive action is the most effective defensive measure against surprise.

The effect of surprise is furthered by variation in the means and methods employed in attack and defense. Fixed methods of procedure enable the enemy to estimate the character and object of an operation.

383. The necessity for guarding against surprise requires adequate provision for the security and readiness for action of all units.

Each unit takes the necessary measures for its own local security as soon as the next higher unit has developed for action. (See pars. 403–404.)

Provision for the security of flanks is of especial importance in combat.

384. The effect of surprise must be reinforced and exploited by fire superiority.

The attack can dispense with fire protection only when covered by darkness, fog, or smoke.

The defense can not ordinarily gain fire superiority through superiority in the means which it puts into action. It must rely for fire superiority on better observation for the conduct of fire, on the more methodical organization of its fire, especially its flankings, more accurate knowledge of ranges and the terrain, the concealment of its dispositions, and the disorganization, which movement and accessory defenses produce in the attacker's dispositions.

385. The necessity for concentrating the greatest possible force at the point of decisive action requires strict economy in the strength of forces assigned to secondary missions. Detachments during combat are justifiable only when the execution of tasks assigned them contributes directly to success in the main battle.

386. The task assigned to any unit must not involve a complicated maneuver. Simple and direct plans and methods are alone practicable in war.

DIRECTION BY THE HIGHER COMMAND.

387. In the advance from their front of concentration, armies and corps establish themselves on successive fronts by assigning march objectives to their component units. Changes of direction are made as required by developments in the situation or as directed in the orders of superior authority. Material changes of direction involving the establishment of a new front of advance are facilitated by placing infantry divisions in second line on the new front, and, when necessary, withdrawing into second line a part of the former first-line divisions. As contact with the enemy becomes closer, the depth of formation is decreased by moving second-line corps or divisions into the first line in accordance with the commander's plan of operations.

388. Considerations of secrecy require that, as far as practicable, the movement of large units at a distance from the enemy be executed at night.

The necessity for marching in a state of readiness for deployment for action and the inability to maneuver troops off the roads by night ultimately force the leading divisions to execute their last marches in approach to the battle field by day. In this situation, night marches continue to be employed to screen the movement of divisions in second and third line and the strategic reserve.

389. During the advance from the front of concentration, the army commander employs the cavalry and air service under his control for the reconnaissance of his assigned zone of operations and other missions required by the situation. Cavalry is assigned to corps and by corps to infantry divisions as soon as they are assigned missions involving the necessity for close ground reconnaissance.

The army commander regulates the displacement of the air service of all the component units of the army. During combat, auxiliary landing fields are designated when the airdromes are too distant to permit of close contact between an air service unit and the commander it serves.

390. In preparation for battle, the army commander reinforces his first-line corps by elements of army troops, particularly artillery and tanks, as required by the situation and the missions assigned to the several corps. In the course of the action, he supports the troops engaged by the artillery retained under his control, the combat aviation, and his reserves. The army artillery reinforces the action of corps and division artillery and operates against distant targets beyond the range of their matériel.

The corps commander similarly reinforces first-line divisions by tanks and artillery and supports them by the use of his reserves and the artillery retained under his control. The corps artillery takes especial charge of counterbattery and long-range interdiction and destruction missions.

391. Army and corps commanders follow the progress of battle through reports of their subordinate commanders, their own air service, and advanced centers of information which establish observation posts on commanding points in the zones of action or sectors of the fighting troops. The observation posts established by advanced centers of information serve for the observation and adjustment of artillery fire as well as for general intelligence purposes. Balloons and observation airplanes are also employed in the adjustment of fire of long-range artillery.

392. Army and corps reserves are put into action either by being placed at the disposal of commanders of the troops engaged, or in the case of reserve divisions by being engaged under the immediate direction of the army or corps commander. In the latter case, the army or corps commander designates the position in readiness from which the reserve is to be deployed for attack or the defensive position which it is to occupy. He assigns it a zone of action or sector and arranges for its support by the artillery, air service, and tanks under his control.

In certain situations, reserve divisions are employed for the relief of divisions exhausted in combat.

393. In open situations the combat orders of army and corps assign general missions to their component units. During the approach to the battle field they indicate the points the seizure of which is of especial importance to the maneuver of the command. In attack, they assign zones of action, directions, and objectives and may indicate the points against which the weight of the attack of subordinate units should be thrown. In defense, they designate in more or less detail the location of the main line of resistance and the outpost position and assign sectors of the position to their component units.

In more methodically conducted operations, such as the attack or defense of fortified positions, armies and corps exercise more detailed control over the action of subordinate units in the initial phases of combat. Corps especially take in hand the organization of artillery fire and in the attack regulate the successive advances of the infantry in the approach to the position. As soon, however, as the conditions which require centralization of control cease to exist, wider initiative is returned to subordinate units.

FRONTAGE AND DEPTH OF DEPLOYMENT.

394. Units are distributed for combat in width and in depth. Their distribution in width and in depth conforms to the missions assigned to them.

Units assigned to decisive missions are distributed in relatively great depth with strong reserves; such units are, therefore, assigned relatively narrow frontages. Units assigned to holding or delaying missions are deployed in relatively slight depth and are, therefore, assigned relatively extended frontages. Holding and decisive actions do not differ in respect to the density of the attacking echelon; they are distinguished chiefly in respect to the strength of reserves.

395. The frontage assigned to any unit is, in general, based upon its infantry strength. It varies with the mission of the unit, the terrain, the amount of artillery support available, and the extent to which the flanks are protected either by natural obstacles or other troops. It should afford sufficient scope for the maneuver of the unit without excessive crowding in a restricted space but should not, on the other hand, be so extended as to expose the unit to penetration.

Forces are seldom uniformly distributed along a battle front. Units usually fight in groups determined largely by the advantages offered by the different sections of the terrain for combat action.

In a decisive attack, an infantry battalion at full strength is assigned a frontage varying from 400 to 800 yards; an infantry division will usually require a frontage of from 2,400 to 4,000 yards. In defense and holding attack, these frontages are usually considerably increased; the greatest extension takes place in the execution of delaying action.

When the situation requires an unusually wide extension of a command, the increased extension is generally effected by increasing the gaps between units; in the general case, it it undesirable to hold an extended frontage by increasing the frontage of units smaller than a battalion.

A unit whose flanks are secured by other troops or impassable obstacles or one that occupies a position naturally strong or made so by adequate fortification may be assigned a relatively extended frontage. Reserves sent in to bring about a decision prepared by other troops or to exploit by pursuit a decision already secured require little depth and may, therefore, be given an extended frontage.

396. Depth in formation for combat rather than a wide extension of front is necessary in the initial deployment. Sufficient depth makes available means to meet the contingencies of combat and the unforeseen developments in the situation as they arise. The progress of battle will call for an extension of front that can not be foreseen at the time of the initial deployment and that can only be met by adequate distribution in depth.

RESERVES.

397. The reserve is the leader's weapon which on the offensive enables him to shape the course of the action and finally to enforce a decision; on the defensive it gives him the means of meeting the adversary's initiative and of passing to the counteroffensive.

Infantry units once committed to action lose their availability for employment in the execution of other missions. Infantry deployed and under fire can change front only at the risk of incurring heavy losses. The leader can materially influence the course of an action once begun only through the employment of his reserve, his air service, and the fire of his artillery.

In reaching his decision to commit his reserve to action, the leader must consider that he thereby loses one of his principal means of influencing the action. Nevertheless, at the decisive moment of action, every man that can be used to advantage must participate in the battle and the reserve must be launched without hesitation. As far as practicable, the reserve is sent in by complete units. Reinforcement by driblets of the troops engaged is avoided. Commanders endeavor to reconstitute reserves from troops which the course of the action has made available.

398. The location of a reserve is controlled by the nature of the maneuver to be executed by the unit to which it belongs.

When the maneuver involves a penetration of the hostile front, the strength of reserves is greatest in front of the enemy's weak points and least in front of points which are naturally strongest and most difficult of reduction. If the maneuver involves an envelopment, the strength of reserves is greatest on the flank in extension of which the envelopment is to take place. In both attack and defense, reserves are frequently required for flank protection. Reserves disposed on the flank of a unit for the purposes of envelopment or flank protection are usually strongly echeloned laterally and in depth.

399. The distance of a reserve from the units which have been committed to action varies with the extent to which clearness exists as to its employment. In the initial deployment, it is held at such distance from the troops engaged that it can be sent in at any point on the front where the plan of action contemplates its eventual employment and at the same time is not exposed to unnecessary losses. As developments in the situation more clearly define the place and time of its employment, the reserve is moved closer to its probable point of intervention. On the offensive, reserves are preferably sent in at points where resistance of the enemy is weakening rather than at those where he is offering most stubborn resistance. Consideration must, however, be given to the importance of objectives, especially in the employment of the reserves of large units. In defense, reserves are either held mobile for employment in the counterattack or are assigned to positions designed to limit a hostile penetration.

400. As long as the combat situation remains obscure, a portion of the artillery is held in reserve. The artillery reserve is not, as a rule, attached to the infantry reserve but is held in readiness for movement to any point where developments in the situation may require its employment. In certain situations it may also be advisable to hold a portion of the artillery in readiness for movement during the course of the action. As soon, however, as the battle front has been definitely established, the mass of the artillery must be in a position to participate in the action; certain units may be directed to reserve their fire pending the development of certain contingencies during the battle.

401. In the initial deployment, a portion of the tank strength at the disposition of higher commanders is usually held in reserve. It may, in whole or in part, be employed in support of the intervention of the infantry reserve or be sent in for the support of units already engaged.

402. Cavalry not required on the flanks or to mask gaps in the battle front is held as a mobile reserve with a view to its employment in the pursuit or for meeting the crises in combat which demand the highest degree of mobility.

DEVELOPMENT.

403. With the approach of the infantry division to close contact with strong hostile forces, it becomes necessary to abandon the road and to develop the route column into a broader formation. Interdiction by hostile artillery of daylight movement on the roads may become effective at a range of approximately 6 miles.

The development of the route column is effected by breaking the single column into several roughly parallel columns; as contact with the enemy becomes closer, these columns are themselves developed into smaller columns. In the development of each unit a portion of its strength is held back until contact with the enemy has clarified the situation.

Time is generally gained in the execution of the development by assigning the longest routes to the leading units of the march column.

404. Each of the columns into which the infantry division is developed is assigned a march objective. Each unit becomes responsible for reconnaissance of its objective and its own local security as soon as the next higher unit is developed. Orders for development frequently assign reconnaissance zones to subordinate units. Terrain features that afford an insight into the hostile dispositions constitute especially important objectives of reconnaissance and of the combat action of units with advanced enemy detachments. Machine guns and infantry cannon advancing by echelon and by bounds take up successive positions covering the advance of infantry units.

ASSEMBLY FOR ACTION.

405. The development of an infantry division usually terminates in the occupation of an assembly position preliminary to deployment for attack or defense. Each of the units into which the division is developed occupies a section of the assembly position assigned to it in the order for the development of the division.

Assembly positions are so selected as to be as far as practicable screened from aerial and ground observation and reconnaissance. The general lie of the position should be such that the troops face in the general direction of their contemplated movement and have at their disposal favorable lines of advance to their deploying positions. When the terrain does not afford cover, the assembly position of an infantry division should be beyond the effective range of hostile artillery. The assembly position of the infantry and the artillery firing positions are usually located in close proximity; artillery protects the occupation of the infantry position.

Massing of units in close formation in assembly positions is avoided. Units are separated by sufficient intervals and distances to insure that concentrated targets are not offered to the hostile aerial or artillery bombardment. Each unit makes its own provisions for local security.

The movement into an assembly position is usually executed by bounds.

The infantry division organizes its attack in its assembly position. It completes arrangements for the execution of its plan of maneuver, makes the necessary arrangements for coordinating the action of the infantry and the artillery, assigns artillery units to the direct support of infantry units, attaches tank units to the infantry, makes provision for establishment of signal communications, and executes such other measures as may be necessary to assure the success of the attack. Infantry commanders and the commanders of artillery units which support them make arrangements for coordinating the action of their units. (See pars. 409–410.)

On the defensive, units are usually placed in assembly positions during the reconnaissance of the defensive position and preliminary to its occupation.

In offensive operations against an unshaken enemy, deployment for attack directly from development without organizing the attack in an assembly position is seldom justified. Such a deployment usually results in a piecemeal delivery of the attack; in view of the great distance at which hostile artillery fire compels a command to commence its development, attack directly from development runs grave risk of loss of control of troops and of deficient support of the action of infantry by the artillery.

ZONES OF ACTION AND SECTORS.

406. In deploying for attack, either from development or an assembly position, units are assigned zones of action and directions of attack.

Zones of action may be defined by designating their lateral boundaries or they may result from the assignment of a front of deployment and the designation of the lateral limits of the objective. Zones of action of units assigned to decisive attacks extend through the depth of the hostile position at least as far as the hostile artillery positions.

In order to take advantage of favorable routes of approach, units may temporarily move into adjacent zones. Such movement must not, however, interfere with the action of adjacent units or result in a dangerous massing of troops. The movement of machine guns in zones of action adjacent to the zone of the units they support is always permissible.

The battalion is ordinarily the smallest unit which is assigned a zone of action. Smaller units are usually assigned directions or objectives.

In defense, units are assigned to sectors of the defensive position.

407. By varying the width of zones of action, the attacker is enabled to throw the weight of the attack against those points of the hostile front which constitute his principal objectives and to commit only minor forces to the attack of secondary fronts.

In general, the weak points in the hostile dispositions constitute the principal objectives of the attack. Zones of action in which such points are included are made relatively narrow, while zones including hostile strong points are more widely delimited.

For similar reasons, the defense assigns broad sectors to units holding the strong points of the position and narrow sectors to those holding the weaker features. (See par. 508.)

APPROACH MARCH.

408. Depending on the situation and the extent to which the terrain affords cover, the smaller infantry units are developed either during the advance into the divisional assembly position or during their advance in attack following the assembly. Infantry units, including reserves, should be completely developed before coming under the effective fire of hostile artillery.

The result of the complete development of the command is to distribute the troops in accordance with the commander's plan of action in an approach formation adapted to minimizing the effects of hostile artillery fire.

The larger infantry units (brigades, regiments, battalions) frequently occupy assembly positions for the purpose of organizing their attack in the course of their advance from the division assembly position. The last assembly position of an infantry unit must not lie beyond the last cover affording protection from hostile small-arms fire; it should also, when practicable, afford cover from both ground and aerial observation.

ARTILLERY MISSIONS.

409. The use of divisional artillery varies with its strength and the tactical situation.

The weaker the strength of the artillery the greater the necessity for its concentrated employment under the immediate direction of the commander of the divisional artillery. Concentrated employment of the artillery will also be the general rule in attack and defense prior to the actual engagement of the infantry.

When the strength of the artillery is sufficient, it is divided into the artillery of direct support and the artillery of general employment preparatory to the deployment for action of the infantry.

410. In attack, it is the special mission of the artillery of direct support to open the way for the infantry by engaging enemy elements which directly impede the infantry advance. Its fire conforms to and accompanies the movement of the infantry. It executes its displacements in conformity with the infantry advance and in such manner as to insure the continuity of artillery support. In defense, it directs its fire on the leading hostile echelons.

In order to assure close cooperation with the infantry, some artillery units are normally assigned for the direct support of designated infantry units with which they maintain constant connection either through common command posts or by means of liaison detachments.

411. The artillery of general employment engages more distant targets (hostile artillery, command and observation posts, reserves, machine guns firing at long range, etc.), and reinforces the fire of artillery units assigned to missions of direct support in accordance with the demands of the situation.

At critical moments in the battle the commander of the divisional artillery, when practicable, concentrates the fire of all artillery, both that of direct support and that of general employment, against objectives of decisive importance.

Similar principles govern the employment of corps and army artillery.

FIRE SUPERIORITY.

412. Superior fire constitutes the best protection against loss as well as the most effective means of destruction. Fire superiority rests chiefly upon the coordination of the action of the infantry and the artillery and the mutual support of infantry units.

Artillery is charged with the general fire support of the infantry; machine guns and infantry cannon take over the close support of rifle companies; rifle companies and their component units afford each other mutual fire support.

413. In attack, rifle companies are advanced to assaulting distance of the hostile position under the supporting fire of the artillery, infantry cannon, and machine guns, and their own alternating fire support. Fire and movement are alternated in such manner that a unit whose advance is made possible by the combined fire of all units moves forward to an advanced position from which it can by its fire help to bring up the units remaining in position. Continuity in the support of artillery, infantry cannon, and machine guns is assured by echeloned advances. Alternate fire and movement finally bring the leading infantry echelon within such distance from the hostile position that the defender can no longer support his leading troops by the fire of his artillery and rearward machine guns without endangering his own troops. As the infantry approaches assaulting distance, it becomes necessary for friendly artillery to lift its fire in order to avoid endangering the assaulting troops. The loss of the direct fire support of the artillery is compensated for by the action of tanks and attack airplanes which intervene at this stage of attack. Artillery, tanks, and attack airplanes support the penetration through the depth of the hostile position; supports and reserves protect the flanks of preceding echelons.

In defense, the fire of infantry and artillery is coordinated in such a way that the artillery fire is especially concentrated on ground which is dead to the fire of infantry weapons and infantry fire thoroughly covers ground that does not readily lend itself to the action of artillery.

In both attack and defense, units are especially designated for defense against low-flying hostile aircraft in order that other units may not be forced to divert their attention from their assigned objectives.

414. Superiority of fire depends not only on volume of fire but also on its direction; fire effect is greatly increased by flanking action. Flanking fire is especially effective when frontal fire is delivered simultaneously against the same objective; a convergent fire results which forces the enemy to defend himself against attack from several directions and thus creates a powerful moral as well as material effect.

In the attack, both large and small units seek for flanking effect by enveloping action. Flanking effect is also secured through the lateral echelonment of machine guns and artillery in respect to the units which they support. Machine guns, taking position in the zones of action of units adjacent to those which they support, deliver flanking or oblique fire over the troops in their front or through gaps between attacking units. Lateral echelonment of artillery for purposes of flanking effect increases the difficulties of fire control and of communication between the infantry and the artillery and can, therefore, be applied only to the smaller artillery units. Infantry units which have succeeded in gaining advanced positions deliver flanking fire across the front of adjacent rearward units.

In defense, the organization of systematic flanking fire constitutes the basis of defensive dispositions. Adjacent units mutually cover their fronts with flanking fire. Machine guns, laterally echeloned, cover the front of the units they support, as nearly as practicable, with continuous bands of fire. The direction of fire of flanking weapons permits of their concealment from the direct frontal observation of the enemy. Flanking defenses, however, require frontal protection; frontal and flanking defenses must mutually supplement each other. Dead spaces in bands of machine-gun fire are covered by the fire of other weapons. Fire effect is increased by obstacles which hold the enemy under frontal and flanking fire. Sections of the defensive position especially exposed to hostile fire may be left unoccupied and defended by flanking fire from adjacent sections

GAS AND SMOKE.[1]

415. Noxious gases are employed to disable hostile personnel or reduce its fighting efficiency, or to interdict areas to occupation or passage by hostile troops.

Hostile personnel may be disabled by surprise gas attacks or by exposure to gassed areas.

The employment of gas may operate to reduce the fighting efficiency of hostile troops by compelling them to wear the mask, with consequent reduction in their mobility and powers of endurance.

Areas interdicted by gas do not prevent a properly protected enemy from passing through them or occupying them for a certain length of time. Gas interdiction does, however, compel troops occupying or traversing the interdicted areas to wear the gas mask, exposes them to casualties, and limits the period during which the area can be occupied without great difficulty and danger.

416. The effectiveness of gas depends in a large measure upon conditions of weather and terrain. Cloud gas can be emitted only when a steady wind in the general direction of the enemy prevails. Gas shell bombardments are most effective in a still atmosphere. Hot sunshine produces upward currents and reduces persistence; gas concentrations are therefore generally most effective when carried out at night. Gas concentrations are most persistent in low ground and in woods.

417. In their tactical application, noxious gases are distinguished as persistent and nonpersistent.

In the attack, persistent gases are employed against areas which are not to be immediately passed over by our own troops. They may thus be used to neutralize hostile sectors adjacent to the front of attack and areas within the front of attack which are to be outflanked or which will not be reached by our troops within the period of persistency. On the other hand, nonpersistent gases may be given general application in the preparation and support of the attack; their use is subject only to the restriction that gas fire on successive areas must cease in time to render concentrations ineffective on the arrival of the attacking troops.

Both persistent and nonpersistent gases are of general application in defensive situations. Persistent gases have especial defensive value by reason of the fact that concentrations established before the hostile attack retain their effectiveness during the course of the attack. In stabilized situations, persistent gases are one of the most effective means of defensive interdiction. In withdrawals, liquids and bombs placed in position may be effectively employed as a means of interdicting the abandoned areas.

418. Gas warfare is conducted by means of artillery projectiles, aerial bombs and devices, liquids and bombs placed in position, light mortar projectiles and gas candles, projectors and cylinders and similar equipment and materials.

[1] See Appendix III.

419. In mobile operations the bulk of the matériel required to establish and maintain effective gas concentrations limits the use of gas to cases where the area to be covered is very restricted and the period for which the concentration is to be maintained is relatively short. These conditions require that the location of the objective shall be accurately known or that the enemy can not evade the gassed area without loss of valuable time or without giving up important advantages of position. Gas may thus be employed in a limited measure for blocking defiles, river crossings, mountain passes, and other important restricted areas and for neutralizing definitely located hostile elements, such as machine-gun nests, centers of resistance, etc.

420. In the deliberately planned attack or defense of a fortified position, the greater time available for bringing up ammunition permits of the more extensive use of gas than in more mobile operations.

421. Gas warfare reaches its greatest development in stabilized situations. Its use is especially favored by the great quantities of ammunition available and the more exact knowledge of the enemy's dispositions.

422. In his approach to a hostile position, an aggressive attacker will not allow his progress to be long arrested by the enemy's attempts to bar his movement by gas concentrations. Gassed terrain which can not be evaded can usually be passed with the protection of the gas mask. As gas settles on ravines and valleys, its effects may generally be evaded by moving into higher ground.

423. Smoke is primarily employed as a means of blinding hostile observation. The basic condition for its use is that while screening our own dispositions and movements from hostile view it must not impede our own observation or adversely affect the control of commanders over their troops. The employment of smoke must, therefore, be closely limited in respect to both space and time. Smoke screens that can not be localized may have adverse effects that can not be foreseen; the generalized employment of smoke over an extended section of the battle field is seldom advantageous.

Subject to these conditions, smoke may be employed to protect the flanks of an attack, to blind hostile observation posts, airplanes, and centers of resistance, to conceal the approach of tanks, to cover a withdrawal, or screen a counterattack.

424. Smoke curtains may be used to inclose the objective of a limited advance. They may thus be effectively utilized in covering the approach of attacking troops to a fortified defensive position, to screen the intrenchment of an advanced departure line in the same situation, to inclose the objective of a limited attack in stabilized situations or to mask a bridgehead in a river crossing. They may also be employed as a feint in similar situations.

425. Smoke is also used in connection with intermittent gas attacks to keep the enemy in a state of uncertainty as to whether gas is being used; by this means the enemy is induced either to wear the mask continually while only smoke is being used or to expose himself to a renewal of the gas attack by removing the mask.

TERRAIN.

426. The character of the terrain often exercises a decisive influence upon the course of operations. While no terrain can, in general, definitely stop an aggressive advance equipped with adequate means, the accidents of the terrain often create advantages for the development of a maneuver that determine the salient features of a commander's plan of action.

427. Commanding elevations form the framework of the system of observation, command, and fire control in combat. They directly determine the location of artillery positions and indirectly that of infantry defensive and assembly

positions. The holding, capture, and neutralization of observation stations often exercise a decisive influence on the outcome of battle.

428. Ridges and valleys generally parallel to the front of advance constitute obstacles to the progress of an offensive and natural lines of resistance for the defense. Valleys generally perpendicular to the front constitute natural corridors of penetration; valleys which slope in the general direction of the advance are most favorable to a sustained offensive by reason of the commanding observation afforded by the heights on either side.

Defiles in the major terrain features parallel to the front (bridges, fords, mountain passes) are important objectives of offensive operations.

429. The major terrain features often determine the natural zones of action or sector boundaries of the component units of a command.

430. In the approach to the battle field terrain features serve to mask the shelter and movement of the troops and thus favor the effect of surprise. They mark the objectives of the successive bounds of the attacking troops.

431. In combat the correct use of the terrain increases fire effect and diminishes losses.

Rolling terrain facilitates observation and overhead fire; it is especially favorable to the attack. Conspicuous terrain features, such as isolated knolls, small thickets, farmhouses, and the vicinity of objects that serve as ranging points for hostile artillery, draw the enemy's fire and should, therefore, be avoided. Crests without a background silhouette the troops occupying them against the skyline; a position on the slopes generally affords better concealment. In defense dead spaces in front of crests are, when practicable, covered by flanking fire or the fire of curved trajectory weapons. Ravines and valleys generally parallel to the front afford cover from ground observation for reserves, artillery, and machine guns employing indirect fire; the slopes are, however, frequently swept by hostile fire, and the greater danger space of projectiles on the slope nearest the enemy often renders it advantageous to occupy the opposite slope.

Open terrain exposes the attacking troops to hostile observation and fire, requires wide intervals in deployment, and makes necessary strong artillery support. Extended observation favors strong artillery concentrations.

Close terrain affords cover from observation and fire but exposes attacking troops to the danger of surprise. Lack of observation renders impracticable strong concentrations of artillery fire and makes it necessary to decentralize the control of artillery units.

Woods and villages afford concealment from both ground and aerial observation. They thus serve to screen the concentration of troops preliminary to battle, their location in shelter, their movement in combat, and the position of reserves and artillery. In defense they serve to mask the approaches to the position. When of small extent, they draw hostile fire and constitute favorable objectives for gas attack.

INTRENCHMENTS.

432. The attack relies chiefly for its protection on fire superiority and adaptation of its dispositions and movements to the terrain. So long as the leading echelon is able to progress under the supporting fire of artillery, infantry cannon, and machine guns, and the mutual fire support of adjacent units, it does not seek protection from hostile fire by intrenchment. When, however, the forward movement is stopped by hostile fires on coverless terrain, units of the leading echelon dig themselves in in their attack formations. Only the simplest forms of intrenchments are constructed. Reserves following the attacking echelon by successive bounds intrench themselves at each halt; as far as practicable, they

utilize and improve the intrenchments constructed by the preceding echelon. Artillery, infantry cannon, and machine guns when necessary improve their firing positions by intrenchments and camouflage; such improvements must not, however, delay the opening of fire.

When, in the attack of a strongly fortified position, the infantry does not succeed in reaching the hostile position, it intrenches itself strongly at the points where it is compelled to halt; from these points, groups work their way forward and again intrench, finally establishing a departure line for delivery of the assault. Special provision may sometimes be necessary to protect important features of a captured position against counterattack. The intrenchment and defense of such features is assigned to designated units in rearward echelons; intrenchment is executed in accordance with defensive principles.

433. In defense, the artificial strengthening of the position is limited only by the time and facilities available. In open situations, protection is, however, to be sought rather in the distribution of defenses in depth and in width, their adaptation to the terrain, and concealment from hostile observation than in the strength of construction. Increase of fire effect by securing superior observation, clearing the field of fire, constructing obstacles, and providing for adequate signal communications is a first consideration; measures for maintaining the fighting power of the troops by intrenchments, shelters, dummy works, masks, and improvement of communications may then be taken.

THE OFFENSIVE.

434. General principles.—The offensive action of every unit is given its direction with reference to an axis of attack.

Troops are distributed with respect to the axis of attack into two principal elements: A main or decisive attack in which the greatest possible offensive power is concentrated to bring about the decision; and a secondary or holding attack designed to contain the enemy, to force him to commit his reserves to action on the threatened front, and to prevent him from reinforcing the front attacked by the troops of the decision.

Orders to subordinate units do not distinguish between the character of attacks; all attacks are pushed home within the limitations fixed by the available means.

435. According to the situation, the decisive or main attack aims to envelop or turn a hostile flank or to penetrate the hostile front.

An envelopment is effected by directing a portion of the forces against the hostile flank while other forces contain the enemy along the front; or by an extension of an attacking wing during the course of the battle by the use of reserves. In the former case, the unit designated for envelopment is deployed with such interval from the forces designated for frontal attack that the lines of advance of the two forces will not conflict with each other. In the latter case, the enveloping wing is strongly echeloned in depth.

In the initial deployment, a simultaneous envelopment of both flanks generally requires considerable superiority of force. Favorable conditions for a double envelopment through the use of reserves may, however, be created during the course of the battle when the success of our own troops has placed the enemy in a disadvantageous situation. In such situations, double envelopment should always be attempted on account of the decisive results which are thereby attained.

The tactical advantages of enveloping action lie mainly in the longer concentric line which makes possible the development of a greater volume of fire and subjects the enemy to flanking and convergent fire effect. Enveloping action enables a superior force to bring into play all its means of action. An enveloping

attack will ordinarily be successful only when accompanied by a frontal attack sufficiently vigorous to force the enemy to commit a large part of his forces to frontal defense.

In the general case, the enemy's preparations to meet an envelopment of his flank can not be as completely organized as the defense of his front. Enveloping action avoids attacking on the ground selected by the enemy; it thus offers better prospects for attacking with the effect of surprise. Successful envelopment directly endangers the enemy's lines of communication and opens the way for the decision. The decisive results following successful action on the enemy's flank favor adoption of the enveloping form of attack whenever practicable.

The general attack is so timed that the enveloping and frontal attacks take place simultaneously or that the enveloping attack is preceded by a frontal attack designed to force the enemy to commit the greatest possible portion of his forces to frontal defense.

436. When the situation does not favor an enveloping attack the main attack is directed with a view to a penetration of the hostile front. The greatest distribution in depth is placed in front of the prospective points of penetration. The distribution of the troops takes into account that after a penetration of the hostile front has been effected, forces must be available for attacking and enveloping the flanks in the hostile dispositions created by the penetration. The mission of the troops designated for the execution of the penetration is to effect a complete break through of the enemy's dispositions so that he will be unable to reconstitute his front on a rearward line; until this mission has been accomplished they do not divert any of their strength to the attack of the flanks of the gap. As a general rule, reserves of corps and larger units only are assigned the mission of rolling up the flanks of a gap created by penetration.

437. Whether the main attack is based upon envelopment or penetration, the engagement in the general case develops locally in a conflict between two opposing fronts. The defender usually strengthens an unsupported flank by reserves echeloned in depth and in width and when threatened with envelopment moves them in part into position to meet the enveloping movement, at the same time attempting himself to envelop the flank of the attacking forces. Since the defender moves on shorter lines, he can readily extend his flank beyond that of the attack up to the limit of his strength. An attempt to meet such movement may lead to overextension or to a dangerous separation of the enveloping forces from the holding attack. It is usually better to take advantage of the enemy's overextension by retaining a deep formation and protecting the exterior flank with reserves than to overextend in an effort to outflank him.

438. When the enemy takes up a defensive position, the commander of the opposing forces always considers the possibility which the situation offers of turning the hostile position. A position which can be turned without requiring an expenditure of time advantageous to the defense has no defensive value. Situations may occur, especially in the pursuit of a defeated force, in which the enemy can be forced by direct attack to take up a defensive position while a portion of the attacking forces executes a turning movement against his line of communications. As a turning movement separates the entire force into two parts each for a time beyond immediate supporting distance of the other, each force must be strong enough for the execution of its mission without calling upon the other for support. Sufficient strength must be available to divide the entire force without giving the enemy a favorable opportunity to defeat the separated parts in detail. In the penetration of a defensive position, the outflanking action of small units is the most effective means of reducing the stronger hostile centers of resistance.

439. While the decisive attack is delivered against the weak points of the enemy's dispositions, hostile forces holding the strong sections are contained by holding attacks. Holding attacks are characterized by lack of depth; reserves are reduced to a minimum; wide zones of action are assigned to attacking units. On the other hand, the effectiveness of the fire which the defender is able to develop in the defense of his stronger sections makes it necessary to give holding attacks strong fire support. Holding attacks executed by large units are supported by strong artillery concentrations; holding attacks executed by small units are similarly given strong support by machine guns and infantry cannon.

440. The tactics of offensive action vary according as the battle is the termination of a maneuver or is delivered on a stabilized front.

In the first case, difference in methods of attack will exist depending on whether the battle is a conflict between two forces each of which attempts the offensive (meeting engagement) or one of which hastily deploys for defense, or the attack is delivered against a deliberately fortified position.

In the meeting engagement and in the attack of an enemy hastily deployed for defense, rapidity of action is an essential requirement; in the former, endeavor must be made to throw the enemy on the defensive by a prompt exercise of initiative; in the latter, the commander must consider that the time which he devotes to preparing the attack is utilized by the enemy to strengthen his position.

When information indicates that the enemy occupies a deliberately prepared, strongly fortified position which can not be outflanked, the attack must be deliberately prepared, detailed reconnaissances executed, and a powerful matériel assembled for the support of the attacking troops. The approach of the principal attacking forces to the position must frequently be executed at night; movements by daylight must be covered by strong fire protection, fog, or smoke screens. Several days may be required to complete the approach to attacking distance. The assumption of the defensive by the enemy gives the attacking forces ample time for the deliberate organization of the attack. Power rather than rapidity in the opening phases, rapidity and continuity in subsequent phases are essential in the attack of a strongly fortified position.

In the attack on a stabilized front, the approach has already been effected, and the attack opens with the assault. Exposed flanks do not exist, the possibility of envelopment is excluded, and the attack takes place by penetration.

Sharp distinction between the various classes of offensive situations and the methods employed can not always be made. Each class may temporarily present aspects which are characteristic of the others. The information secured by reconnaissance and the commander's estimate as to the character of the situation with which he is confronted determine the methods to be adopted by the attacking forces.

441. The meeting engagement.—In a meeting engagement, a great advantage accrues to the force which first succeeds in making effective preparations for battle. Action can not be delayed awaiting the results of detailed reconnaissances. Prompt estimate of the situation, quick decision, and early starting of the units of the main body to their assembly positions are essential to success.

442. The meeting engagement calls for the widest possible exercise of initiative by division commanders in the execution of the general missions assigned them in the orders of higher units.

Information procured by the air service, the cavalry, and the advance guard during the advance of the division affords a basis for the commander's preliminary dispositions.

443. Decision relative to the employment of the advance guard and the artillery constitutes the commander's first problem and the basis for the employment of the infantry of the main body.

It is the special mission of the advance guard to secure possession of the features of the terrain that will afford extended observation for the artillery and other features of importance to the action of the main body such as defiles, woods, and villages. This mission requires aggressive action against hostile advanced troops and the employment of the mass of the advance guard as a unit. On the other hand, it is also the mission of the advance guard prior to battle to gain time for the deployment of the main body and to cover its deployment. This mission as a general rule requires the deployment of the advance guard on an extended front; involvement in engagements with superior hostile advance troops may, however, not only make it impossible for the advance guard to execute this mission but may also require the commander of the troops to support it by throwing units of the main body into action in the order of their arrival. The situation thus created removes all possibility of the launching of the main body into action as a unit and runs the risk of defeat in detail. Situations may, however, occur when the importance of securing initial advantages or of retaining those already gained by the advance guard may make it necessary to employ a portion of the main body in this way.

As a general rule, the advance guard most effectively performs its mission when, after securing possession of the essential terrain features, it is extended on a broad front covering the deployment of the main body. Its artillery, deploying on a broad front, opens long-range fire on enemy columns forcing them to an early extension and interdicting the principal routes of approach.

The cavalry of the command, after withdrawal from the front of the advance-guard infantry, is employed on the flanks either to screen our own dispositions or execute reconnaissance against the hostile flanks and rear.

444. The action of the main body is prepared at an early stage of the advance by the command and artillery reconnaissance details marching with the divisional cavalry or other advanced elements of the division. (See par. 204.) Their reconnaissance of artillery positions and of assembly positions for the organization for attack of the infantry forms the basis for the deployment of the main body. The reconnaissance details operate in accordance with instructions of the division commander and the commander of the artillery based on the reconnaissance of the air service, the divisional cavalry, and other sources of information.

The principal considerations in the selection of the position for the deployment of the artillery are: Ability to bring concentrated fire on the objectives of the division, to protect the infantry in its assembly position and support it in attack; the existence of adequate facilities for observation; and the masking of the batteries from hostile reconnaissance and observation. Basing his estimate on these and other factors of the situation, the artillery commander submits his recommendation relative to the employment of the artillery to the division commander.

445. The division commander, taking into consideration the advance-guard situation, the recommendations of the artillery commander, the information relative to the hostile dispositions, the mission of the division, and the terrain, makes his decision as to where the main attack will be made and the preliminary measures to be taken by the units of the main body.

The plan of attack is based upon an envelopment of a hostile flank or a penetration of the hostile front. (See pars. 435–436.)

The initial orders of the division commander are ordinarily in the form of individual orders to the various elements of his command.

446. The first orders to the artillery assign to it only general missions.

The first mission of the artillery is to protect the development of the infantry and its occupation of the assembly position. Occupation of a temporary position in readiness or observation by a portion of the artillery may be necessary in order to insure that as far as practicable infantry does not come under hostile fire without artillery protection.

The mass of the artillery occupies its firing positions as soon as practicable. In its initial deployment a portion of the artillery strength is held in readiness for movement until the situation has been clarified by actual contact of the infantry with the enemy.

447. The division commander develops the infantry of the main body by assigning march objectives to infantry units. Such objectives are usually the sections of the assembly position to be occupied by the units concerned. Each of the larger infantry units is assigned march objectives as it arrives.

448. The division message center is located as soon as possible in order to permit of the prompt establishment of signal communications. The division commander gives the division signal officer the necessary instructions relative to the establishment of the axis of signal communications and the employment of signal troops.

449. Field and service trains are directed to proceed to designated rendezvous positions. Medical officers conduct reconnaissance for the location of dressing stations and field hospitals.

450. The division commander endeavors to clarify the situation by intensifying reconnaissance activity during the development of the main body. He gives the divisional air service, the cavalry, and the advance guard the necessary instructions to this effect and in addition sends officer patrols to points on the front with reference to which he particularly desires information. Reconnaissance seeks especially to discover the distribution of the enemy's forces, the weak points in his dispositions, the location of his flanks, and his artillery positions, and the most favorable routes of approach. Portions of the divisional observation squadron are placed at the disposition of the artillery commander as soon as the artillery deploys for action.

451. Basing his decision on the information relative to the enemy and friendly troops, his mission, and the terrain, the division commander completes his plan of attack and issues his attack order when units have reached their assigned locations in the assembly position.

452. The attack order of the division commander gives such information relative to the situation as is essential to the proper guidance of subordinate commanders, states the general plan of attack, gives instructions relative to reconnaissance and security, assigns zones of action, objectives, and other missions to the several units of the division, and gives the location of the division message center, the axis of signal communications, and the advanced message center.

Depending on the nature of the maneuver to be executed, a general line of departure is designated from which the attacking troops are launched at a prescribed hour, or separate lines of departure and hours are assigned to the several attacking units.

453. The commander of each infantry unit directs its advance in his zone of action in accordance with the situation and the mission assigned to him. He details a reconnaissance detachment to reconnoiter his zone of action and supports the action of the reconnaissance detachment with the machine guns and infantry cannon at his disposal. In order to keep the troops well in hand, it is usually advisable to regulate the advance of units prior to contact with the hostile infantry by successive bounds from one position to another and with reference to a designated base unit. Terrain features which afford extended

observation, or which are otherwise of tactical importance, constitute the objectives of each bound.

Each infantry battalion in the attacking echelon directs its movement to the most advanced position at which it can be formed for attack under cover from small-arms fire.

Deployment as skirmishers does not take place until the necessity arises for opening fire. Infantry units select their first firing position at the closest possible distance from the hostile infantry.

454. When the necessity for the protection of the advance guard ceases, its units are assembled, placed in reserve or returned to the control of their higher commanders; the advance-guard artillery is usually directed to report to the artillery commander.

455. The object to be accomplished in advancing the attack from the first firing position is to bring infantry rifle companies to assaulting distance from the hostile infantry under the protection of the fire of artillery, machine guns, and infantry cannon and the mutually supporting fire of units of the rifle companies themselves.

While prior to commencement of the infantry fire fight it is generally necessary to regulate the infantry advance by bounds and with reference to a base unit in order to maintain the cohesion of the attack, this method of advance ceases as soon as the infantry fire fight commences. Each unit pushes its attack in its zone of action or on its assigned direction to the limit of its fighting powers. The most advanced unit becomes the base unit.

456. As a general rule, the attack order of the division commander assigns artillery units to missions of direct support of the infantry. Supporting artillery units send liaison detachments to the corresponding infantry commanders. Artillery supports the infantry attack by progressive concentration as far as practicable in accordance with the requests of the infantry commanders. Economy of ammunition generally requires artillery fire to be delivered in short bursts. Infantry units must take immediate advantage of artillery fire effect to gain ground to the front.

The artillery endeavors to execute its missions with the fewest possible changes of position. Frequent changes of position reduce the volume of fire support, and the occupation of a new position and renewal of preparations for fire require considerable time. Nevertheless, change of position should unhesitatingly be made when fire effect or deficiency in the means of communication with the infantry require it. Changes of position are generally effected by echelon and are prepared by timely reconnaissance of advanced positions.

The division commander regulates concentrations of artillery fire so as to bring the greatest possible volume of fire on objectives of decisive importance at the critical moments of the attack. Support is as a general rule concentrated against the fronts where the infantry has succeeded in making greatest progress. When the infantry arrives at close range of the hostile infantry, all the artillery, including the artillery of general employment, is concentrated on the hostile infantry. Airplanes at the disposition of the artillery and artillery observers observe fire effect and adjust the fire upon the enemy elements which offer most serious resistance to the attacking troops.

457. The hostile resistance is broken by a series of local assaults delivered by units of varying strength on their own initiative or on the orders of higher commanders. Each unit delivers the assault at the earliest moment that promises success.

The commander of a unit preparing to deliver an assault either arranges for its delivery at a certain hour, communicating his plan to the artillery, or notifies the artillery that he is about to assault by a prearranged signal (e. g., rocket).

The artillery increases the intensity of its fire and then progressively increases its range. Under the cover of the supporting fire of artillery, machine guns, and infantry cannon, the assaulting unit advances as close to its objective as possible, and when the preparatory fire is lifted from the objective charges the hostile resistance in a single rush.

458. The artillery must employ all means at its disposal (observers, liaison detachments, artillery airplanes, lines of signal communication to infantry units, etc.) to obtain exact information relative to the situation of the infantry; infantry must cooperate by employing all its means of transmitting information to the artillery (display of panels, flares, various means of signal communication, etc.). Artillery never attempts to deliver fire of direct support in ignorance of the location of the infantry; when uncertain as to the infantry situation, it either executes such change of position as will bring it into closer contact with the infantry or transfers its fire to more distant targets.

459. When the infantry approaches to assaulting distance, the division commander sends out infantry airplanes to observe the situation of our own and the hostile advanced infantry. They report to the division commander and the commanders of infantry units the points on the front where the attack is stopped, those where penetrations have been effected, hostile counterattacks, and other features of the situation of our own and the hostile advanced infantry. Command airplanes inform higher commanders as to developments farther in rear of the battle front—shifting of reserves, arrival of reinforcements, train movements, etc. These reports and information received from other sources enable commanders to direct the movements of reserves toward those portions of the hostile front that offer the greatest prospects for decisive success and to support the attacking troops in repulse of counterattacks.

460. As soon as the assault is launched on an extended front, a portion of the artillery of direct support executes a change of position. It supports the action of infantry in repelling counterattacks, in attacking any rearward position on which the enemy may attempt to reconstitute his defense, in exploiting a decisively successful attack by pursuit. The division commander maintains the continuity of the attack by the use of his reserve.

461. **Attack of a hastily occupied defensive position.**—The general principles of deployment for action in the meeting engagement apply also in the attack of an enemy who hastily deploys for defense. The assumption of the defensive by the enemy, however, gives the attacker time to undertake a more deliberate organization of the attack and to base the plan of attack on a thorough reconnaissance of the hostile position.

462. **The attack of a fortified position.**—The attack of a fortified position involves a thoroughly organized reconnaissance of the hostile position and its foreground, the pushing of advanced detachments into the closest possible contact with the main hostile forces, the approach of units of the main body to their deploying positions under the protection of the advanced detachments, and a final simultaneous attack along a broad front, supported by a powerful artillery and tanks.

463. Reconnaissance seeks especially to determine the extension of the main hostile position, the location of its flanks, defensive works, observation posts, and artillery positions, and the hostile occupation of the foreground of the position. It involves the combined use of the air service, the cavalry, the infantry, and the special means at the disposition of the artillery and signal corps (flash and sound ranging units, ground and aero intercept units, listening-in service). Strong pursuit aviation is concentrated to gain the supremacy of the air, which is a necessary condition to the effective action of the observation squadrons.

Aerial reconnaissance commences while the troops are still in march and continues throughout the approach and the attack of the position. Photographs taken at successive intervals show the progress of construction of enemy works and enable the commander to form an estimate as to the location of the main hostile position. Direct observation by low-flying observation airplanes affords indications relative to the distribution of the hostile forces.

Cavalry establishes contact with the advanced hostile troops, and when its progress is arrested by stronger enemy elements directs its activities to locating the flanks of the position.

464. As a general rule, the operations of the advanced detachments in securing contact with the main hostile forces are conducted by day; the movement of units of the main body in approach to their deploying positions takes place at night. The practicability of this procedure is, however, influenced by the time available for the execution of the attack; the general situation may require an early launching of the attack with a consequent reduction to a minimum of the time devoted to effecting the approach.

465. In the general case, the enemy will attempt to screen his main position and deceive the attacker as to his dispositions by the employment of advanced detachments. To gain an insight into the main hostile position, it will be necessary to break through the hostile screen and drive in advanced enemy troops. Advance guards are strongly reinforced by artillery for the attack of advanced enemy detachments; infantry reinforcements are reduced to a minimum. The action of the advance troops results in a series of partial engagements for the possession of important points in the foreground of the hostile position.

The indications afforded by aerial reconnaisssance as to the location of the main hostile position determine the terrain features of the foreground from which the most extended views into the enemy's dispositions can be obtained. These features become the most important objectives of the partial engagements delivered by the attacker's advanced troops.

During the preliminary operations, the main body of infantry is held back in a position of readiness beyond the range of hostile artillery fire. Measures are taken to protect the troops from hostile aerial observation and attack.

466. When aerial reconnaissance and the contact established by the advanced infantry have failed to establish definitely the main hostile position, reconnaissances in force by strong detachments are executed at critical points along the front of attack. The result of these reconnaissances determines either that the advanced troops have established sufficiently close contact with the main enemy forces or that a further progression of the advanced troops is required.

467. The progression of the advanced troops ultimately establishes them in a position facing the terrain of the attack and covering the deployment for action of the main body.

Reconnaissance of the terrain of attack is executed with a view to locating the most favorable routes of approach to the hostile position. Aerial photographs furnish indications which serve for the effective direction of the enemy's attention to particular sections of the front where decisive operations are contemplated.

Artillery conducts reconnaissance for the location of its battle position and the routes of approach thereto.

Reconnaissance of the hostile position is intensified with especial reference to the features affecting the commander's decisions relative to his plan of action. For this purpose, determination of the weak points in the enemy dispositions is of especial importance.

468. In accordance with the results of reconnaissance and his mission, the commander decides to make the main attack either by envelopment or by penetration.

469. The positions for the deployment of the artillery are selected with reference to facility for bringing concentrated fire to bear on the objectives of the attack. Defilade, concealment from aerial reconnaissances, and requirements in depth are also considered.

The artillery usually moves into its positions by echelon; the movement is frequently wholly or partially executed at night.

When necessary, the artillery registers on important objectives developed by reconnaissance. Its first task is to protect the approach and assembly for attack of infantry units; the hostile artillery and observation posts constitute its principal initial objectives. All means at its disposal are employed for adjustment and registration of its fire (observation posts, balloons, airplanes, aerial photographs, flash and sound ranging units, meteorological units). Long-range artillery is placed well forward so as to be able to take under fire the most distant echelons of the defender's light and medium artillery.

470. Infantry commanders are given early information relative to their assembly positions and zones of action in order that they may make their own reconnaissances and form their plans of action in a timely manner.

Infantry usually moves into its assembly positions under the protection of the advanced troops at night with a view to the launching of the attack at daybreak. Movement of the infantry units into their assembly positions by day is generally practicable only when an overwhelming artillery support is available.

471. When the attack does not succeed in reaching the hostile position, the infantry intrenches itself at the points which it has reached. The night is utilized to extend the advance; strong patrols with machine guns are sent forward to occupy advanced positions; the infantry intrenches itself in a new position under the protection of its patrols. Several progressions of this character may be necessary to bring the troops within assaulting distance of the hostile position.

The assault frequently takes place at daybreak at an hour fixed in the orders of higher commanders.

472. The general attack after the assault of a fortified position breaks up into a series of separate combats throughout the depth of the hostile position. These separate combats are directed by subordinate commanders within their zones of action and supported by all the means at their disposal. Their first task is to penetrate the position as far as the line of hostile artillery. Resistances are as far as practicable either outflanked or reduced by envelopment. The utmost importance attaches to maintaining the continuity of the attack by the use of reserves and the timely displacement of the supporting artillery. Reserves sent in at points where the greatest progress is being made protect the flanks of the leading units and support them in the repulse of counterattacks. Artillery especially observes probable assembly areas of hostile reserves and seeks to break up counterattacking formations.

473. **Attack on a stabilized front.**—The object of a major attack in a stabilized situation is to force the enemy into open ground with a view to his subsequent defeat by the application of the methods of open warfare. The objective and direction of the attack are so selected that a successful offensive will render the enemy's general position untenable and force his withdrawal on a wide front.

The selection of the front of attack is also influenced by local conditions existing on the various sectors of the general front along which the two forces are in contact. Factors which are to be considered include: Facilities for extended observation which will contribute to the effectiveness of artillery support; extent to which the terrain facilitates the infantry advance, the displacement of artillery, and the movement of tanks; ease of screening the preparations for attack and the occupation of the position from hostile observation and recon-

naissance; adequacy of the road net and transportation lines for the movement of troops and supplies into position.

474. The attack generally encounters a powerfully organized defensive system, echeloned in great depth and supported on its flanks by other troops or by impassable obstacles. The absence of flanks restricts the offensive to attack by penetration and increases the difficulty of attacking with the effect of surprise. The thorough organization of the defensive system, moreover, increases the dependence of the attacker on surprise effects and emphasizes the importance of screening the preparations for the attack from hostile investigation. The prolonged period during which the two forces have been in contact makes available detailed information relative to the hostile dispositions which the nature of the situation enables the attacker to supplement by reconnaissance prior to the attack.

475. In addition to the preparations in the sectors where the main attack is to be made, one or more secondary sectors are more or less completely prepared for attack.

476. The zone of the attack may be extended by designating sections along the front selected for attack for neutralization by gas.

477. Based on the objective to be taken, the front selected for attack, the resistance to be overcome, and the available forces, a general plan of attack is prepared which determines the limits of the front of attack and of the objective, the troops to be employed, the sectors, zones of action and missions to be assigned to the several elements of the command, and the preparations to be made prior to the occupation of the sectors by the attacking troops.

In accordance with the general plan, the several commanders and the services charged with missions in the preparation and execution of the attack prepare detailed plans for the employment of the elements under their control. The general plan of attack makes provision for the action to be taken in case the enemy withdraws from his position prior to the delivery of the assault.

478. All preparations for the attack are as far as practicable completed before the occupation of the sector by the attacking troops. Preparatory measures most likely to betray the imminence of the attack are deferred as long as possible. Exact calculation is necessary in the determination of priorities in the execution of preparatory measures.

Preparatory measures include—

Preparation of the sector and its rear areas for occupation by the attacking units; construction of command and observation posts and message centers in accordance with the distribution of sectors to attacking units; establishment of lines of signal communication for the purposes of command and fire control; preparation of battery positions; location of airdromes; shelter for reserves; road construction and improvement and extension of transportation lines; establishment of dumps of ammunition, engineer matériel, rations and forage and provision for water supply; construction of shelter for dressing stations and field hospitals; placing in readiness of hospital trains and medical supplies.

Reconnaissance of the sector and its approaches by officers of troops designated for the attack or participating in the preparations therefor; marking of routes of approach and places of formation for attack of the several units.

Preparation of fire: Organization of artillery groupings including artillery of attacking and reserve divisions and the reinforcing artillery; assignment of missions to the several groupings; necessary technical preparations to enable artillery to open fire without prior registration; preparation of firing data.

Adoption of measures to screen the preparations for attack; camouflaging or masking of all constructions; testing of camouflage by aerial photography; aerial surveillance of activity within our new lines with a view to noting any indications that might reveal the preparations of the attack to hostile aerial

reconnaissance; surveillance of the use of signal communications by the intercept and listening-in service; surveillance by the intelligence service of the execution of preparations from the point of view of secrecy; restriction of movement of troops, railroad traffic near the front, and construction work to hours of darkness.

Especial consideration is given in the preparation for the attack to measures designed to insure the continuity of action of the attacking troops. Adequate provision is made for the placing in readiness of the necessary material and engineer and labor units for the construction of roads and transportation lines connecting our own system with that of the enemy.

479. Reconnaissance continues throughout the period of preparation in such manner that the appearance of normal activity is maintained. Reconnaissance is also executed on fronts which are not to be attacked. Reconnaissance of the front of attack seeks especially to discover the location of the hostile main line of resistance, centers of resistance, observation and command posts, accessory defenses, battery positions, ammunition dumps and supply establishments, the movement of troops, railroad movements, new constructions, airdromes, and transportation lines. Information collected by reconnaissance is disseminated to the units concerned in the form of intelligence summaries, information maps, and airplane photographs.

In connection with the execution of the reconnaissances, the observers and pilots of reinforcing air service units are given an opportunity to familiarize themselves with the terrain of the attack.

480. The control of the artillery participating in the execution of the attack is initially concentrated in the hands of corps and army commanders. The artillery of the attacking divisions is returned to control of division commanders when its missions in the preparation of the attack are completed.

481. Considerations of security and secrecy usually require the artillery to move into its positions by echelon and at night. Units assigned to positions screened from hostile aerial reconnaissance are first moved into position. The movement of artillery during the night before the assault is reduced to a minimum in order to avoid interfering with the occupation of the position by the infantry.

In order that the artillery support may be continued as long as possible without change of position, the artillery is deployed on as advanced a position as practicable.

The echelonment in depth of artillery units is determined by considerations of the terrain, objectives, range of the matériel, and the priority of displacement of the several elements in the course of the attack. In the several artillery echelons, it will frequently be advantageous to place the units which are to remain longest in position in the most advanced location (e. g., truck artillery of the G. H. Q. reserve, artillery of reserve divisions).

482. The concentration of the attacking divisions preparatory to their movement into the sectors of attack is carefully screened. Movement as a rule takes place at night in accordance with an accurately calculated schedule. All lights are shaded from aerial observation. During the day, the troops are concealed in woods or villages. Movement is expedited by the use of motor transportation. Movement of the infantry into its assembly positions usually takes place the night before the date fixed for the assault.

483. The duration of the artillery preparation varies with the situation. A prolonged preparation is destructive of the effect of surprise and gives the enemy time to assemble reserves and take other countermeasures. The length of the preparation is influenced by the extent to which tanks are to participate in the attack and rôle assigned to them. According to circumstances, the duration of the artillery preparation may vary from zero to eight hours.

484. The fire of each artillery unit throughout the preparation and the first stage of the attack is regulated in accordance with maps or charts showing the distribution of its fire during definitely stated periods. The fire of machine gun units participating in barrage fire is similarly regulated.

The nature of the artillery preparation depends upon circumstances attending each particular case. Concentration of effect is greatly favored by dividing the preparation into phases. In general, the object of the first phase of the artillery preparation is to neutralize the defender's artillery, dislocate the most important agencies of command and fire control, isolate the defender's forces from their communications with the rear, and protect our own troops from the fire of defensive works in the hostile infantry position. Artillery fire of the first phase of the preparation thus comprises counterbattery fire, destruction or neutralization fire on command posts, message centers, and signal communications, interdiction and destruction fire on enemy communications, and protective fire on the hostile infantry positions.

In the subsequent phase of the preparation, sufficient artillery continues counterbattery fire to maintain the neutralization of the hostile artillery. The fire of the mass of the remaining artillery is concentrated on the hostile centers of resistance in the infantry position.

Throughout the preparation and the attack, long-range heavy artillery delivers interdiction and destruction fire on the enemy rear areas and lines of communication; railroad stations, road centers, balloons, and airdromes are objectives of especial importance.

Mortars in advanced positions execute destruction fire on hostile accessory defenses and trenches in the advanced defensive zone.

485. As a general rule, infantry units are deployed in depth for the assault. While under favorable circumstances it may be practicable to mass the units at close distances with a view to their subsequent distribution in depth after passing the hostile front line, such a disposition runs grave risks of incurring heavy losses from the hostile counterpreparation, especially if the enemy withdraws the mass of his artillery to a second position.

486. Infantry units are distributed with a view to moving the strongest possible fire power to an advanced position at the earliest practicable moment. A large proportion of the infantry strength in machine guns and infantry cannon follows close behind the leading companies. Detachments detailed to clean up hostile trenches and dugouts follow the assaulting echelon. Carrying parties usually follow the leading battalions.

487. The distribution of artillery fire in support of the assault comprises fire in direct support of the infantry (rolling barrage) and protective fire directed against all points in the hostile position from which the enemy can bring fire to bear on the attacking infantry or carry out observation for the direction of the fire of his artillery.

The purpose of the rolling barrage is to prevent the enemy from manning his defensive works in time to meet the assault. Its progression is regulated by a time-table calculated in accordance with the probable rate of advance of the assaulting troops as influenced by terrain conditions and other factors of the situation.

Protective fire on the infantry position is lifted to correspond with the time-table regulating the infantry advance during the first phase of the assault. To deceive the enemy and induce him to man his positions, fire is frequently lifted prior to the arrival of attacking infantry and then brought back to its original objective.

The artillery of the attacking divisions prepares for its change of position as soon as its missions in connection with the barrage and protective fire have been

completed. Engineer units supplied with the necessary matériel and transportation are attached to the artillery to assist in its forward movement across the shell-torn zone. The artillery remaining in position continues its fire up to the limits of its effective ranges.

488. The situation which develops following the assault of the enemy's main line of resistance, road conditions, and the possibility of maintaining ammunition supply largely determine the strength of the artillery to be moved into advanced positions.

489. The action of the air service is especially concentrated over those portions of the hostile front where the plan of battle seeks to secure the most decisive results. Pursuit aviation is launched in attack either at the hour fixed for the assault or during the artillery preparation. Successive formations of pursuit advance at least as far forward as the hostile artillery position, driving the hostile aviation from the air and crippling the action of the hostile artillery by the attack of hostile airplanes and balloons engaged in the adjustment of artillery fire.

The action of attack aviation is closely coordinated with that of the assaulting infantry. Its first objectives are the objectives of the assault upon which its attack is timed to coincide as nearly as practicable with that of the infantry; subsequent objectives are hostile reserves forming for counterattack and columns moving on the roads or across country.

PURSUIT.

490. Only by means of a relentless pursuit of the beaten enemy can the full fruits of victory be obtained. Pursuit of a decisively defeated enemy must be pushed to the utmost limit of the physical endurance of the troops and no opportunity given him to reorganize his forces and reconstitute his defense. The object of the pursuit is the annihilation of the hostile forces. This can not be accomplished by a straight pushing back of the hostile forces on their lines of communication. Direct pressure against the retreating forces is combined with outflanking maneuver designed to place our own troops across the enemy's lines of retreat. By the concentrated employment of every agency of destruction and terrorization at the disposal of the field forces, the shaken morale of the defeated enemy is converted into panic and the incipient dissolution of his organization is transformed into rout. Encirclement of the retreating forces and of the separate elements thereof by double envelopment is always attempted wherever conditions permit.

491. Effective pursuit requires the impulsion of leadership and the exercise of initiative in all echelons of command in the highest degree. When their troops are victorious all infantry commanders press forward to spur on their troops and clinch the advantage gained by the use of their reserves.

Wide decentralization in the assignment of missions and the control of supporting artillery, designation of distant objectives, the employment of artillery and the air service to obstruct movement of columns on the enemy line of retreat, and the prompt launching of cavalry to strike the enemy in flank and rear and cut off his retreat are essential to decisive results.

492. The pursuit is conducted on a broad front. Reserves sent in to exploit the success do not require the depth required in the attack of an unshaken enemy.

Troops before whom the enemy is giving way attack him on the front and send in their reserves to gain his flank and rear or break through his covering troops.

Reserves of large units are regrouped to correspond to the situation created by the hostile defeat and are assigned directions and zones of action designed to bring the pursuit to a decisive conclusion. According to circumstances, such directions and zones of action may be an extension of the flanks or through the wider

gaps that defeat has opened up in the hostile dispositions or in continuation of the zones of action of units exhausted by the attack. Motor transportation is employed to increase rapidity in the shifting of reserves.

493. Artillery fire of pursuit and aerial attack constitute the most effective means of defeating the enemy's attempts to reorganize his forces for their movement in retreat.

The employment of artillery is based upon the maximum exploitation of the mobility and the range of lighter pieces and the long range of the heavier types. Light artillery attached to pursuing infantry regiments, in addition to directly supporting the action of infantry, takes under fire enemy elements attempting to re-form columns in rear of the advanced troops. Long-range artillery working with balloon observation continues its fire on the enemy communications up to the extreme limit of its ranges.

So far as is permitted by the air situation, the action of all branches of combat aviation is concentrated on bombing and machine-gun fire against hostile ground troops.

Bombing squadrons seek to block defiles on the enemy's line of retreat by bombing attack and gas concentrations.

494. Whenever practicable, cavalry advances along roads paralleling the enemy's line of retreat, delivering repeated attacks against the hostile flanks, carrying out destructions on his line of retreat, attacking convoys and attempting to beat the enemy to defiles, bridges, and other critical points.

495. The enemy's attempts to organize his retreat under the cover of darkness must be frustrated. Units which have advanced without serious opposition during the day continue their march during the night. Other units organize successive limited attacks against the enemy in their front. The air service searches enemy routes of retreat with flares and bombs all enemy columns discovered in movement.

496. The nature of the situation during pursuit frequently requires extensive reliance upon radio transmission for communication with the advanced troops. The importance attached to hostile interception of radio communications in other situations does not obtain in equal degree in the pursuit. The construction of telephonic lines is concentrated upon the most important axes. Effort is made to push advanced message centers close behind the leading troops. In any case, the pursuit is not checked by reason of the lack of signal communications.

497. Adequate provision for the supply of ammunition to the pursuing troops is essential to the success of pursuit. Wherever practicable, the motor columns of large units deliver ammunition direct to troop units; transloading to animal-drawn transportation is reduced to a minimum.

THE DEFENSIVE.

498. General principles.—From an operative point of view, the object of defensive action is to gain time pending the development of more favorable conditions for undertaking the offensive (e. g., through the arrival of reinforcements) or to economize forces on a secondary front with a view to concentrating superior forces for the decision.

The position on which defense is offered must conform to the operative objective sought. Its defense must gain the time for the assumption of the offensive on the defended front or for the development of the offensive by the forces seeking the decision on another front. It must therefore force the enemy to a direct attack or to a time-consuming turning movement. A position that can be readily turned has no defensive value.

499. Whatever may be the operative considerations involved in the adoption of a defensive attitude, the tactics of defensive action are essentially the tactics of holding extensive fronts with relatively weak forces.

500. The defense, no less than the offense, must, wherever possible, act with the effect of surprise. The visible lines of a defensive system must not betray the defensive dispositions but rather serve as a mask concealing the real defensive organization. Every available means must be employed to mislead the attacker as to the position on which the defense intends to make its principal effort.

501. Wherever practicable, the defense is conducted on mobile principles. Mobility is acquired by distribution of defensive positions in depth and the holding out of reserves. Operative considerations may, however, require a rigid defense of sections of a defensive front, the loss of which would render the general defensive front untenable or otherwise seriously affect the conduct of the operations on other sections of the front. Mobile and rigid defense are so combined that the possession of the points essential to the maneuver of the defensive forces is retained, the maximum forces are made available for counter-offensive purposes, and the enemy is kept in ignorance as to the character of the resistance with which he is confronted.

502. The defense must be aggressive. The counterattack is the decisive element of defensive action. It is seldom possible to hold a defensive system by merely passive resistance. The defense as well as the offense must act by movement as well as by fire.

503. A defensive position comprises a zone of resistance of variable depth; the forward edge of the main defensive position constitutes the main line of resistance.

The main line of resistance is the line in front of which the fire of all elements of the defense is concentrated to break up the hostile attack and which must be retaken by counterattack in case of hostile penetration.

504. The defense in open situations.—The mission and the situation generally impose more or less definite limitations in respect to the locality where resistance may be offered. Within the latitude fixed by these limitations, the commander selects a position that will enable the defending forces to deliver combat under the most favorable conditions.

The considerations which exercise the greatest influence upon the selection of the position and the location of the main line of resistance are facilities for observation, infantry field of fire, concealment from hostile observation, and the location of natural obstacles.

In principle, the determination of the terrain features necessary to effective artillery observation precedes the decision relative to the location of the main line of resistance. The main line of resistance is so located as to afford adequate protection to artillery observation posts.

As a general rule, the main line of resistance should afford a clear field of infantry fire at close and mid ranges. Consideration of concealment from hostile observation may frequently make it desirable to locate the line of resistance on a reverse slope. A reverse-slope position is generally practicable only when possession of the crest in front is not essential for the purposes of observation of artillery fire. When the main line of resistance is located on the forward slope, the zone of resistance may be extended to include the reverse-slope position. When the main line of resistance is located on a reverse slope, the combat battalions push forward a portion of their machine guns to the crest with a view to firing on attacking troops during their approach to the position.

Natural obstacles (e. g., river lines, woods, swamps) frequently determine the general location of a defensive position. The location of obstacles to the approach of tanks may influence the siting of the main line of resistance.

As a general rule, long gentle slopes afford better conditions for defense than commanding elevations. Commanding positions are usually to be selected only for the execution of a delaying action.

505. A position combining all defensive advantages will seldom be available. The weak points of a position are strengthened by appropriate dispositions; a short field of frontal fire is compensated for by the organization of a dense flanking fire; exposure to hostile observation by distribution in depth, construction of numerous dummy works and masks; deficient observation by increased strength of local garrisons, etc.

506. The depth of the zone of resistance varies with the width of the sectors and the terrain. Units assigned to wide sectors deploy in slight depth, and conversely, units assigned to narrow sectors deploy in great depth. As a general rule, the distance between successive echelons should not exceed mid range; on the other hand, the distance should be sufficiently great to prevent any echelon from falling within the zone of dispersion of artillery fire directed on the preceding echelon. When attack by hostile tanks is anticipated, the zone of depth between the first two echelons should be sufficient to permit of the organization of close-range antitank defense.

507. The occupation of a defensive position is preceded by a more or less detailed reconnaissance as permitted by the situation. Commanders of large units usually determine on the general location of the position from the map. Whenever practicable, the division commander, accompanied by the commanders of the several arms of the service, precedes the troops for the execution of detail reconnaissance on the ground. A general reconnaissance by the division commander and the commander of the artillery, fixing in a general way the observation stations required for the artillery and the location of the zone of resistance, is followed by the assignment of zones of reconnaissance to infantry and subordinate artillery commanders. The reconnaissance bears not only on the defensive position but also on the probable routes of hostile approach; it seeks especially to determine the location of the main line of resistance, the lines of approach most advantageous to the hostile attack, the probable assembly positions of the attacking troops, the probable hostile artillery positions, and the features of the terrain available for hostile observation. Basing his action on his own personal reconnaissance, the reconnaissance reports of his subordinates, his mission, and the available information relative to the enemy and friendly troops, the commander forms his estimate as to the point where the main hostile attack is to be expected and makes his decision relative to the location of the main line of resistance, the employment of the artillery, the distribution of sectors, and the strength and location of the reserve. Successive reconnaissances by lower commanders finally result in fixing the distribution of smaller units and the detailed location of their combat emplacements. Exact information as to the trace of the main line of resistance is furnished to the artillery.

508. The distribution of large units to the various sectors of a defensive front is chiefly based upon operative and strategical considerations.

The distribution of infantry units for the defense of a divisional sector is based chiefly upon the relative strength of the various portions of the sector from the point of view of fire effect.

The strong features of a position are, in general, those parts of the position in front of which the hostile approach is exposed to observation and fire over a long distance. Troops holding these features will derive full benefit from artillery and machine-gun support and do not therefore require the infantry strength necessary for the defense of weaker sections of the position.

The weak features of a defensive position are those which permit of the covered approach of the attacking forces to within close range of the position. Such features require infantry garrisons of sufficient strength immediately at hand to meet the hostile forces in close-range combat.

The assignment of sectors to infantry units conforms to these principles; narrow sectors are assigned on the weaker portions of the front and broad sectors on the stronger portions. By adaptation of the width of sectors to their natural strength, there results an economy of force which enables the commander to hold out the maximum strength for counteroffensive purposes.

The direction from which the main attack may be expected chiefly determines the location of the reserve. According to circumstances, it is echeloned for protective purposes in rear of an exposed flank, held in a position in readiness from which it can deliver a prepared counterattack, or so disposed that it can take up the counteroffensive by striking in flank a hostile attack which breaks down in front of the main line of resistance.

The artillery is so echeloned in depth as to assure that a portion of its strength is in a position to fire on the hostile forces during their approach and assembly for attack and that another portion will be able to continue in action when the enemy approaches to assaulting distance of the main line of resistance. The echelonment in depth is limited by the consideration that the entire artillery, including the rearmost echelon, must be able to concentrate its fire in front of the main line of resistance and that the foremost echelon should as far as practicable be able to fire with observation from a rearward observation post in case of failure of observation in the infantry positions. In addition to the mass of the artillery thus deployed in depth, single platoons or batteries may be detached for the close-range defense of the main line of resistance. They do not participate in the counterpreparation, but are held in concealed positions with a view to their employment in direct fire against hostile forces which succeed in penetrating the main line of resistance. It is their especial mission to deal with the attack of hostile tanks.

509. The trace and distribution of firing emplacements of infantry units conform to the combat formations of units. In the initial deployment for defense, firing emplacements consist of lengths of trenches for combat groups or separate trenches for individual men; continuous trenches for units larger than a squad are seldom constructed. The fire trenches, sited with a view to frontal fire and mutual flankings, are combined into supporting points held by the larger units. Fire trenches and supporting points are irregularly grouped and unequally spaced so as to take best advantage of terrain conditions. The main line of resistance is thus irregular in trace with elements sited for frontal and flanking fire. Machine guns are so sited that as nearly as practicable they cover the entire front of the main line of resistance with continuous bands of fire and are at the same time capable of delivering long-range fire during the hostile approach and of taking under flanking fire hostile elements which succeed in penetrating the main line of resistance. The difficulty of camouflaging communication trenches as a general rule precludes their construction in open situations.

510. The occupation of the defensive position by large units is, wherever practicable, covered by outposts located at sufficient distance from the main line of resistance to prevent the occupying forces from being taken under fire by hostile light artillery. Artillery is attached to the outpost troops.

The situation determines whether the outposts are to retain their position after the occupation of the main position of resistance has been completed. When the flanks of the outpost are not protected by other troops, the danger of envelopment will usually require an early withdrawal of the outpost troops.

When the flanks of the outpost are protected by other troops, it will sometimes be advisable to instruct the outposts to hold their positions either definitely or long enough to force the enemy to deploy his artillery for the attack of the outpost position, thus imposing on him the necessity for a displacement of his

artillery for the attack of the main position. The outposts are instructed either to hold their positions or to conduct a delaying action in withdrawal on the main position; in the former case relatively strong outposts are required. The principles governing the defense of the main line of resistance (see pars. 504–509) apply also to the defense of an outpost position. (See also pars. 554–556.)

When decision is made to withdraw the outposts without awaiting the hostile attack, the foreground of the main position is temporarily held by outguards detailed by the leading infantry units (combat outposts). When practicable, steps are taken for the organization of a second position at such distance from the main position that it can not be taken under fire by hostile artillery without effecting a displacement.

Whether or not an outpost position is held, the essential consideration is to keep the enemy in doubt as to the character of the first resistance he encounters and the position on which the principal defensive effort is to be made.

511. The priority of work in advanced positions is determined by the principle that considerations of fire effect take precedence over those of cover. After the location of combat emplacements has been fixed, first priority is ordinarily given to clearing the field of fire, removal of objects masking our own observation and of those within the position capable of serving as reference points for hostile observation and fire, and determination of ranges to points in the foreground. These measures are ordinarily followed by provisions for camouflaging the works to be constructed; then construction of the various defensive works (fire trenches, observation posts, command posts, message centers, cover for reserves), obstacles, dummy works, masks, marking and preparation of routes of approach for reserves. Artillery gives first priority to the construction of observation and command posts; protection for the guns is chiefly obtained through provision for mobility in their employment, selection of alternative emplacements, defilade, camouflage, and adequate echelonment in width and depth.

512. When the situation permits, weak advanced cavalry or mobile infantry detachments strongly reinforced by machine guns and supported by artillery operate well in front of the defensive position. By their fire and their movement in withdrawal, in conjunction with dummy works, they endeavor to deceive the enemy as to the defensive dispositions, lead him in a false direction, and cause him to deploy prematurely and on incorrect lines. Deploying on a broad front, they occupy successive positions on commanding ground and take advantage of every opportunity to open heavy surprise fire on formed bodies of hostile troops, without, however, allowing themselves to become closely engaged.

513. Reconnaissance during the occupation and preparation of the defensive position seeks especially to determine the principal routes of hostile approach, detraining stations, deployment of the hostile artillery, and assembly positions of the hostile infantry.

514. Higher commanders determine the conditions under which artillery fire is to be opened during the hostile approach. In determining the time for opening fire, consideration is given to the fact that premature opening of fire by the mass of the artillery gives the enemy information relative to the location of the position and the deployment of the artillery and that he may employ weak detachments for the purpose of inducing the defender to open fire and reveal his dispositions. Fire is not opened by the mass of the artillery until targets of sufficient importance are disclosed.

515. The artillery of the attacker is most vulnerable from the moment when it comes within range of the defender's artillery until it has completed its deployment. During this period it constitutes the principal objective of the defender's artillery fire and aerial reconnaissance. The fire of all available artillery is con-

centrated with a view to crippling the hostile artillery as far as practicable before it can get into action. Counterbattery continues to be the principal mission of a portion of the artillery, especially the long-range medium artillery, throughout the battle.

Advantage is also taken to open fire on hostile infantry advancing in vulnerable formations. Daylight movement on the roads is interdicted.

516. As soon as the assembly for attack by the hostile infantry is discovered, the fire of the mass of the artillery is directed on the hostile infantry. Infantry cannon and a portion of the machine guns reinforce the fire of the artillery. Infantry opens rifle fire on favorable objectives at mid range.

517. When the front and direction of the main hostile attack have been determined, the defense at once takes steps to meet it. Fire on the advancing infantry is continued, the combat outposts are withdrawn, and the defense on the threatened front is reinforced. The reinforcement is not as a rule employed to increase the strength of the holding garrisons of the main line of resistance; it is generally applied to the reserve. The result of the reinforcement is to increase the force designed for aggressive action rather than that intended for merely passive defense.

518. A unit intrusted with the defense of a sector under no circumstances abandons it unless it has been authorized to do so in certain contingencies by higher commanders.

519. If the hostile attack breaks down in front of the main line of resistance, the enemy will be unable to withstand a determined counteroffensive. The defense must be prepared to change to the offensive and exploit the results of successful defensive action.

Should the enemy succeed in penetrating the position, the defender seeks to strengthen the flanks of the gap and maintain his hold on the supporting points on either side of the gap, resist all attempts to widen it, and counterattack on the flanks of the salient rather than to attempt to close the gap by throwing troops across the head of the salient.

520. When the battle is interrupted by nightfall, outguards and listening posts (combat outposts) are established by the leading companies or battalions in front of the main line of resistance. Provision is made for patrolling and illuminating the foreground. Garrisons of supporting points are reinforced. Machine guns are laid on lines of fire flanking the supporting points. Outguards send up prescribed light signals for artillery support in case assembly of hostile troops for attack is discovered. Similar provisions are necessary in case of fog; sound signals supplement the usual light signals.

521. When the enemy succeeds in establishing himself at close range from the main line of resistance, it will frequently be advisable to redistribute the forces in depth. In such case the main line of resistance may be transferred to a rearward echelon of the main zone of resistance, and the original main line of resistance held by combat outposts, or the main position of resistance may be held as an outpost position and the principal forces transferred to a second position (see par. 510), which then becomes the main position of resistance. Withdrawal to a second position is as a rule advisable only when information indicates that the enemy has massed a powerful artillery concentration to support a renewed attack.

522. Development of a fortified position.—The development of a hastily occupied defensive position into a more strongly fortified defensive system is dependent upon the situation and the time and material available for construction, and varies according as it takes place following an indecisive battle, is carried out on a stabilized front, or is executed in accordance with deliberately prepared plans out of contact with the enemy.

The general priorities indicated in paragraph 511 apply also to the development of a fortified position in contact with the enemy.

523. The development of the defensive position aims first of all to strengthen the main position of resistance, battery positions, and the general operative and command facilities of the entire position. The means employed include numerous communication trenches, obstacles, shelters (splinter proofs, dugouts, concrete shelters), observation and command posts, signal communications, gun positions, and supply and ammunition dumps.

Great care is taken to camouflage the most important works and construct the more visible features of the position in such manner that they will not disclose the distribution of troops.

524. The reasons which lead to the omission of communication trenches before the enemy has effected his approach (see par. 509) no longer apply after he has established contact with the defensive position. Communication trenches greatly facilitate the exercise of command, the movement of troops, and the functioning of supply; they are indispensable in the prolonged occupation of a position.

As a general rule, communication trenches should not be employed as combat emplacements in the main zone of resistance. Their use for this purpose enables the attacker to neutralize the defending forces by successive concentrations, whereas the separation of combat emplacements from the trenches and effective camouflage force his artillery to attack by zone firing. Communication trenches should be so sited that they will afford no indication to the enemy as to the location of the combat emplacements.

The impossibility of camouflaging communication trenches makes advisable their construction for the purpose of affording a covered approach to the defensive position only in cases where natural or artificial masks can not be relied upon for concealment from hostile ground observation. This consideration and the labor involved may lead to the construction of trenches for this purpose only over exposed stretches on the routes of approach from the rear; in such cases the routes of approach are conspicuously marked.

525. The nature of overhead cover varies with the location of the troops to be sheltered. The only forms of protection against fire of permanent value are dugouts and concrete shelters sufficiently resistant to withstand high-power artillery. Deep dugouts in the front lines do not, however, permit of the prompt egress of the troops, and in case of attack become mere mantraps; it is, moreover, generally impracticable to construct concrete shelters in the advanced zone of the first position. Overhead cover in the front lines of a first position is chiefly designed with a view to affording splinter-proof protection and shelter from the weather only. Lack of strength is compensated for as far as possible by the increased number and smaller size of the shelters.

Concrete shelters may be constructed in the advanced zone of rearward positions.

Overhead cover is an essential means of conserving the fighting capacity of the troops in the prolonged occupation of a position. Reserves within range of hostile artillery fire are as far as practicable sheltered in bomb-proof dugouts.

Shelters in the advanced zone are, as a rule, sited in positions detached from the communication trenches and are not connected with them by open trenches; movement to and from the shelters is usually restricted to the night. Especial importance attaches to the construction and camouflage of machine-gun shelters, overhead cover is provided for the personnel, but the firing positions are usually located on open ground.

Command posts and message centers require especially resistant overhead cover by reason of the fact that they constitute centers in the established network of signal communications, and changes in their location during battle are very difficult to make.

526. Signal communications are strongly reinforced. Units are connected by telephone lines not only with the rear but also laterally; the importance of lateral lines consists not only in affording direct communication between adjacent units but also in making available numerous alternative lines of communication between advanced units and the rear in event of the failure of a direct line.

527. The provisions of paragraph 511 apply in principle to the development of battery positions. The greatest attention is given to developing the means of observation, command and fire control, and providing the necessary roads and transportation lines for the supply of ammunition. Shelters are constructed for the personnel, and provision is made for the storage, protection against weather, and camouflage of the ammunition. For the protection of guns, less reliance is placed upon the fortification of gun emplacements than upon camouflage and provision for numerous alternative positions.

528. Obstacles are, in general, employed for two purposes: To hold the attacking forces as long as possible under the flanking fire of automatic weapons, and to prevent a sudden irruption of hostile forces into the front line of defense. The general trace of obstacles depends chiefly upon the flankings. By a proper coordination of flankings and obstacles and a suitable arrangement of gaps, attempt is made to canalize the attacking troops into avenues of approach where they will come under the destructive fire of machine guns. Obstacles in the main line of resistance must be concealed from hostile observation; concealment of obstacles in front of the outposts is impracticable when in contact with the enemy.

Dummy works, properly constructed, serve to mislead the enemy and disperse his fire. To be effective, they must closely resemble genuine works; dummy works easily recognizable as such give the enemy valuable negative information. They must bear evidence of an attempt at camouflage.

529. Comprehensive measures are taken in stabilized situations for the provision of an adequate road and transportation net in view of a major battle. Wherever practicable, road circuits are established, and ample loading facilities are made available. Narrow-gauge railways, tramways, and motor transportation are employed as far as possible for the movement of supplies from the railhead.

530. For the procurement by purchase or requisition of the matériel necessary in the fortification of a position, the available region is divided into zones, and detachments with the necessary transportation under the direction of the engineers are detailed for the work of collection. Matériel that can not be obtained locally is furnished by the communications zone. The matériel obtained is collected into dumps administered by the engineers. In stabilized situations, plants for working up raw materials for construction purposes are established.

531. Troops, divided into reliefs for the purposes of work, carry out the fortification of the position in accordance with a systematic plan of work.

532. The siting of works with a view to effective drainage is always given due consideration. In a stabilized situation, the problem of drainage assumes great importance and may require comprehensive consideration involving a number of divisional sectors. Geological assistance is obtained when necessary. The advice of geologists is also of especial value in connection with the siting of deep dugouts and the development of water supply.

533. In addition to the parks and depots of large units, small dumps of ammunition, rations, and close-combat matériel are established in the sectors of small units.

534. The fortification of a second position at such distance from the first position that the attacker can not direct the fire of his artillery upon it without

displacing his guns facilitates the conduct of a mobile defense. Oblique switch positions connecting the first and second positions may be organized on sections of the front where it is of especial importance to limit the effect of a hostile penetration. Switch positions also serve as bases for the delivery of counterattacks.

The priority of work in the construction of a rearward position is largely determined by considerations of the length of time required for the construction of the various essential works and the extent to which they lend themselves to camouflage. Important works requiring a considerable period for their construction come first in order of priority; works that would disclose the position to hostile aerial reconnaissance are omitted. After reconnaissance and determination of the method of occupation of the position, command posts, observation posts, shelters for the troops (dugouts, concrete shelters) and obstacles are constructed; the construction of fire and communication trenches is deferred until troops occupy the position.

535. The defense of a stabilized front.—The defense of a sector on a stabilized front seeks in general to hold the ground up to the front of contact or in any case to abandon it only in the face of a strong hostile concentration. Minor rectifications of the position may be effected through attacks with limited objectives or limited withdrawals.

The importance of the sector and the situation determine whether or not, in event of the discovery of a strong hostile concentration, the position will be definitely held or the principal defensive effort transferred to a prepared second position beyond the range of the mass of the hostile artillery deployed for the attack of the first position.

Regardless of the decision relative to withdrawal from the position in event of a strong hostile concentration, the possibility of a surprise attack requires the preparation of a plan of defense under the assumption that the position will be held against both major and minor attacks.

It is frequently advantageous to site the main line of resistance beyond the range of enemy mortars; combat outposts hold the foreground of the position.

536. Infantry regiments are generally disposed abreast; in each regiment, battalions are usually disposed in echelon. The leading battalion (combat echelon) holds the principal zone of resistance and covers its front with combat outposts. The succeeding battalion is the support battalion and holds a position from which it can support the combat battalion by counterattack and limit a hostile penetration of the principal zone of resistance. The rear battalion is the reserve battalion and during quiet periods is held at rest in an area removed from the most effective ranges of the hostile artillery; provision is made for rapidly bringing it into action.

When a withdrawal of the main defensive forces to a rearward position is effected, the position held by the leading battalions becomes an outpost position and the leading battalions or elements thereof constitute the outpost.

Instructions of the division commander designate the reserve battalions which are to be held at his disposition. Other reserve battalions are held at the disposition of infantry commanders.

537. The division commander prepares a plan of fire coordinating the fire action of the infantry and the artillery.

538. The commander of the divisional artillery prepares the plan for the employment of the artillery in accordance with the instructions of the division commander. He constitutes artillery groupings based on the relative importance of the several missions of the artillery and the strength of the artillery at his disposal.

His first task is to provide as completely adequate provision as possible for the immediate fire support of the infantry.

The fire support of the infantry is based primarily upon execution of counteroffensive preparation upon actual or probable assembly places of the attacking infantry and tanks. The object sought in counteroffensive preparation is to break up the hostile attack before it can be launched.

In case the enemy succeeds in launching his attack in spite of the counteroffensive preparation, barrage fire is placed close in front of the advanced infantry.

Plans for the delivery of counteroffensive preparation and barrage fire are based as far as practicable on concentrating fire on the zones or fronts from or against which information indicates that a hostile attack is developing or, in the absence of information, on critical zones or fronts. Distribution of fire along the entire front is ineffective. Machine guns and infantry mortars participate in counteroffensive preparation and barrage fire; their fire plans are coordinated with those of the artillery by the fire plan of the division commander. Provision may be made for reinforcing counteroffensive preparation and barrage fire by artillery normally assigned to other missions or by the artillery of adjacent divisions; their fire is ordinarily superimposed on that of the batteries normally assigned to missions of direct support.

Counteroffensive preparation and barrage fire is released either on report by artillery observers or balloons of the development of a hostile attack, or on the request of airplanes or the infantry. At night, or in a fog, chief reliance must be placed on light and sound signals. (See par. 520.)

The artillery of general employment executes its usual missions. (See par. 411.) These include destruction fire on hostile artillery (counterbattery), machine-gun emplacements, observation posts, shelters, and other enemy works and interdiction fire especially directed against sensitive points in the hostile position (command posts, shelters, approaches, lines of communication).

The corps commander gives the division instructions regulating employment of the divisional artillery in the execution of its more distant mission. The army and the corps reinforce the action of the divisional artillery in the execution of destruction and interdiction fire by the fire of the artillery retained under their control and extend in depth the zone of action of the divisional artillery by the use of the longer-range matériel at their disposal. Long-range destruction and interdiction fire is directed especially on sensitive points in the enemy's rear areas and on his lines of communication (railroad stations, railroads, crossroads, supply establishments, airdromes, etc.).

In quiet periods the employment of batteries assigned to interdiction missions is regulated by a plan of fire which seeks to inflict losses on the enemy and harass him in the functioning of his supply service, execution of reliefs, movement of transportation, etc. The plan of harassing fire seeks for surprise effects; regularity in the delivery of fire, both in respect to hours and objectives, is avoided.

In quiet periods mobility in the employment of batteries assigned to counterbattery and harassing missions is essential. For the delivery of fire they occupy during the night previously surveyed positions removed from their regularly assigned emplacements; after delivery of fire, they are withdrawn from their temporary positions.

All echelons of artillery participate in antitank defense. In addition it may in some cases be advisable to hold in readiness a certain number of batteries for movement to any part of the position where hostile tanks may succeed in effecting a penetration.

539. The echelonment in depth of the artillery takes into consideration the range of the several classes of matériel, the location of the objectives of the different echelons, and the possibilities of neutralization by hostile counterbattery fire.

In order to assure that the batteries of direct support are not put out of action at an early moment and the infantry thus deprived of direct artillery fire support, they generally occupy a rearward position in the artillery echelonment. In the light artillery the batteries of direct support are usually posted farthest to the rear.

The objectives of the light artillery assigned to more distant missions usually require them to be established in positions farther to the front. In order to reach into the depth of the hostile dispositions as far as possible, it is often advisable temporarily to locate elements of long-range artillery in the most advanced positions.

540. Antiaircraft batteries are distributed in checkerboard formation in such manner as to create as far as practicable two continuous zones of antiaircraft fire. In addition, units of antiaircraft artillery are assigned to the local defense of important roads and installations (railroad stations, ammunition parks, airdromes, etc.). The antiaircraft intelligence service, employing the special communications net at its disposal, gives prompt warning of the approach of hostile aircraft to antiaircraft units, the air service, and the troop units concerned.

541. Constant reconnaissance and observation of the enemy's dispositions is conducted with a view to securing the earliest possible indications of the enemy's intentions and the data required for the conduct of fire.

Aerial photography and the interpretation and exploitation of aerial photographs assume increased importance in stabilized situations.

Raids executed with a view to the capture of prisoners often yield valuable indications as to the hostile intentions.

The stationary character of the situation lends especial importance to the action of the intercept, listening-in and radio-goniometric services, and to flash and sound ranging.

542. Where a stabilized situation continues for a prolonged period, the necessity for conservation of the fighting power of the troops requires provision for the periodic relief of the divisions in line. For the sake of continuity in the execution of the plan of defense, it is as a general rule advantageous to avoid relieving the artillery and the infantry at the same time. The relief is preceded by a detailed reconnaissance of the sector by officers of the relieving division. The execution of the relief takes place under the direction of the commander of the division to be relieved; he remains responsible for the defense of the sector until the relief has been completed.

543. When information indicates that the enemy is preparing a major attack, the higher command decides whether the position is to be held or the principal defensive effort transferred to the second position.

When the decision is made to offer the principal defense on the first position, plans for the reinforcement of the threatened front are put into effect. The measures in preparation of sectors for the reinforcing divisions and other troops are similar in scope to those described in paragraph 478. The evacuation of the civilian population from the rear areas is frequently necessary.

Division commanders retain control of the divisional artillery, which may be reinforced by additional artillery placed at the disposal of the divisions for the execution of the defensive action.

Pursuit aviation is reinforced with a view to facilitating the execution of aerial reconnaissance.

544. The action of the defense is based primarily upon the execution of a counterpreparation which seeks to break up or cripple the hostile attack before it can be launched.

It is important to take hostile artillery under fire at an early moment, to interdict hostile routes of approach, to dislocate as far as practicable the hostile sys-

tem of command and fire control by fire on command and observation posts, telephone centrals, etc., and to open destruction fire on trench-mortar emplacements, shelters, and other works in the enemy's position of especial importance to the success of his attack.

Bombing squadrons reinforce and extend in depth the counterpreparation fire of the artillery. Their action against hostile ammunition dumps, supply establishments, airdromes, railroad stations, etc., may have important effects in delaying the hostile preparations for attack. Attack airplanes search hostile lines of communications and attack enemy columns, supply trains, etc., discovered in movement.

When the imminence of the infantry attack is discovered, the fire of the mass of the artillery is directed upon the known or supposed assembly positions of the attacking troops.

545. When the counterpreparation does not succeed in preventing the hostile infantry from debouching for attack, barrage fire is placed close in front of our own advanced infantry. If the attack succeeds in penetrating the line held by the combat outposts, the barrage is transferred in front of the main line of resistance.

546. Infantry defends its positions by the employment of all the weapons at its disposal; it does not rely solely upon counterpreparation or barrage fire for the repulse of the hostile attack.

The action of the infantry in defense of its positions takes place in accordance with general defensive principles.

WITHDRAWAL FROM ACTION.

547. When the commander decides that the situation no longer offers any prospect for the successful termination of an engagement, he takes the necessary measures to disengage his forces from action, to regain his liberty of action by placing distance and a rear guard between his principal forces and the enemy, and to prepare for a renewal of the battle under more favorable conditions elsewhere.

548. A withdrawal by daylight involves such heavy losses and so great a degree of disorganization that it is as a rule preferable to hold out at all costs until nightfall and effect the withdrawal under the cover of night. Rearward echelons only can as a rule be withdrawn by day.

549. The infantry engaged, supported by the artillery, machine guns, and infantry cannon, stubbornly holds its positions.

The commander makes especial provision for holding as long as possible the road centers that control the communications to the rear and the features of the terrain that afford extended observation over the areas in rear of the battle front.

Successful counterattacks create the conditions most favorable to the withdrawal.

Pursuit airplanes seek especially to relieve the lines of retreat from the pressure of bombardment of hostile long-range artillery by attacking balloons and observation airplanes adjusting hostile artillery fire.

550. The higher command designates a defensive position on which the troops will prepare for a renewal of resistance and under the protection of which the troops may, if circumstances require it and the situation permits, be assembled for a retrograde march.

When the defensive or assembly position lies at a considerable distance from the battle front, the commander of the troops selects a covering position usually located on the flank of the line of retreat and details a covering force from any available reserves to occupy it and cover the withdrawal of the troops engaged. Artillery is attached to the covering force.

551. As soon as practicable the commander of the troops makes the necessary arrangements for the occupation of the new defensive position. (See par. 507.) He assigns sectors of the position and lines of retreat to the units of the command, sends ahead signal troops for the establishment of lines of signal communications, and takes the necessary steps to clear the routes for the movement of the troops. Prompt starting of field and service trains to the new areas, evacuation of the wounded, energetic measures for the maintenance of traffic control, construction of the necessary bridges, and preparations for the execution of demolitions on the lines of retreat are of the first importance.

552. The withdrawal of the greater part of the forces engaged commences at nightfall; only weak elements are left in immediate contact with the enemy.

The withdrawal is executed on a broad front; troops retire in small columns which after passing the covering position are assembled into larger units at designated initial points. Engineers furnish guides to bridges when necessary.

The elements left in contact with the enemy screen the withdrawal by simulating great activity; by heavy firing from different positions, reconnaissances of strong combat patrols, sending up numerous rockets and flares, they endeavor to create the impression of heavily held lines.

When the withdrawal of the main body is assured, the covering force follows it to the new defensive position.

553. The subsequent course of the retreat is governed by the circumstances. As soon as the command succeeds in freeing itself from the enemy, a regularly constituted rear guard is organized to cover the retreat. (See pars. 234–239.)

DELAYING ACTION.

554. When a position is occupied merely to delay the enemy and withdraw before becoming closely engaged, the important considerations are—

The enemy should be forced to an early deployment in order that a timely withdrawal may be effected; the position occupied should, therefore, have a good field of fire at long range; field of fire at close range is of less importance.

The ground in rear of the position should favor a withdrawal by screening the troops from hostile view and fire as soon as the position is vacated.

Delaying action is most effectively executed by troops possessing a high degree of mobility and armed with long-range weapons; cavalry, horse artillery, infantry in motor trucks, machine guns, and armored cars are especially adapted to the execution of delaying action.

555. The defense is made by groups holding the natural strong points of the terrain and separated by considerable intervals. Supports protect the flanks of the strong points; reserves posted well to the rear cover the withdrawal of the leading troops.

556. Delaying action finds especial application in the operations of cavalry units, rear guards, and outposts. (See pars. 82, 83, 234–239, 310.)

CHAPTER XII.

SPECIAL OPERATIONS.

NIGHT OPERATIONS.

557. General principles.—The difficulty of screening daylight movements from aerial observation, coupled with the destructive effects of observed fire, lends great importance to night operations. Resort must frequently be had to the cover of darkness in order to effect surprise and to minimize losses.

558. Night operations may be resorted to for secretly effecting concentrations before or during battle; executing an approach march and deployment preparatory to launching an attack at daybreak; crossing zones made impassable by hostile fire by day; executing a reconnaissance; securing possession of a favorable departure line for the delivery of a daylight attack; organizing the ground; bringing up supplies; pressing a pursuit; and screening a withdrawal.

559. Night combat is characterized generally by a decrease in the effectiveness of aimed fire and a corresponding increase in the importance of close-combat weapons and the fire of fixed weapons capable of being laid on definite targets or areas by day; by difficulty in movement, troop leading, and the maintenance of direction, cohesion, and communication; and by a more highly sensitive morale of the troops.

Decrease in the effectiveness of fire permits of the closer formations required without exposure to excessive losses; difficulty in the maintenance of control and direction indicates the necessity for limitation of objectives; 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.

Night conditions decrease the effectiveness of aerial reconnaissance, but are especially favorable to aerial bombardment.

560. Surprise is the most essential element in the success of night operations; troops must make their preparations and arrangements in such manner as to avoid betraying their intentions. In the case of night concentrations, daybreak must find the troops either in position or concealed in woods, villages, etc., and the trains under cover. In daylight preparations for night attacks, movements that would betray the intention to the enemy are avoided.

561. Attack.—Night attacks always possess an element of chance that must be reckoned with when ordering them. The best available troops should be employed. The difficulties of such attacks increase with the size of the command. They are therefore usually undertaken only on a limited scale and with limited objectives. The moral value of the troops and the quality of the leadership, especially in the subordinate grades, rather than numbers, are likely to measure the success attained.

Night attacks are often the manifestation of an aggressive leadership, which, undismayed by foreseen difficulties, is determined to bring about conclusions without delay.

562. The hour at which a night attack should be made depends upon the object sought. Attack during early hours of darkness frequently strikes the enemy before he has had time to organize the artillery support of his leading troops. An early attack also anticipates possible night operations on the part of the enemy. After victorious combat, it is of especial importance to frustrate by an early attack the attempts of the defeated force to organize its withdrawal at nightfall.

A major offensive with a distant objective is seldom launched during the hours of darkness. The night is utilized in connection with major attacks chiefly for the execution of preparatory measures and the placing of the troops in their assembly positions; the attack is usually launched at or shortly after daybreak.

563. The decision to attack should be made while there is yet sufficient daylight to make all preliminary reconnaissances and necessary preparations. A thorough knowledge of the ground and of the enemy's position is necessary for the subordinate commanders. The most favorable time for beginning the reconnaissance is shortly before dusk, so that both the day and night aspects of the terrain may be studied. Easily identified direction points are located and provision made for guides.

564. Orders for night attacks are formulated with more than usual definiteness. Routes of approach, assembly positions, and objectives are designated with the utmost exactness; the bounds of movement in approach, the occupation of assembly positions, and the delivery of the assault are regulated in accordance with precise time tables.

In the conduct of night attacks, only the simplest formations are employed. The smaller units normally advance in one column until close to their objectives when heavy skirmish lines are formed and the enemy rushed with the bayonet without firing. The assaulting lines are followed closely by their supports and local reserves.

The larger units are formed in assault columns and each column given a definite direction and objective. Communication is maintained between columns, and every precaution exercised to avoid their colliding with one another.

Secrecy in preparation, silence, and cohesion in execution are essential to success.

On capturing their objectives each unit is at once re-formed and dispositions promptly taken to meet a counterattack. Their further detailed conduct is prescribed in the orders directing the attack.

565. The particular circumstances attending each situation will usually indicate whether the infantry assault should be prepared by artillery fire. Where artillery support is indicated, a short but violent preparation will generally suffice. In any case, however, the artillery holds itself in readiness to intervene promptly and energetically.

566. Defense.—Vigilant outguards, active patrolling well to the front, and illumination of the foreground must be relied upon to give timely warning of attacks. Positions are usually occupied in greater density than by day. When attack is suspected or known to be in progress, supports and local reserves are brought closer to the main line of resistance.

The fire of fixed weapons, obstacles, and counterattack are the principal means of breaking up and repelling the assault. Infantry does not open fire until the enemy is close enough to offer an unmistakable and profitable target. The chief reliance is placed on the bayonet. Local supports and reserves, using the bayonet only, counterattack, preferably against the enemy's flanks.

If successful in repelling the attack, the defending troops are immediately re-formed.

COMBAT IN WOODS.

567. General principles.—In respect to decrease in the effectiveness of fire, increase in the importance of close combat, difficulty in the control of troops, and reduced effectiveness of aerial observation, combat in woods partakes in a lesser degree of the characteristics of night combat.

Woods, especially those with dense undergrowth, afford considerable protection against the effects of fire but lend themselves to gas concentration. They

are especially favorable to delaying actions as they keep the attacker in ignorance of the strength of the forces confronting him and provide desirable cover for screening the withdrawal.

568. Attack.—With larger forces the offensive usually seeks to turn 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. Where this course of action is inexpedient, the woods must be attacked. The near edge of the woods is carried like any other position and then used as a departure position 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 resembling those on open ground but with greater density in the leading echelon are generally most suitable. In dense woods, small columns will usually be more effective. Special measures are taken to insure the maintenance of direction, intercommunication between the columns, and cohesion. Supports closely follow the assault units. The vulnerability of the flanks to counterattack requires special measures for their protection. Absolute silence is observed, as the sound of voices and other noises assist the enemy in locating the flanks and estimating the strength of the attacking force.

Before debouching from the woods and while still far enough from the edge to be beyond the enemy's view, dispositions adapted to fighting on open ground are taken. As the edge of the woods presents a well-marked target for hostile fire, the attacking forces in making their egress seek to establish themselves quickly in a selected position on open ground rather than to remain in the edge of the woods itself for any length of time.

569. Defense.—As a defensive position, the edge of a woods has the objection of presenting a clearly defined objective to the attacking forces. A position in the interior of the woods is not open to this objection, but has the disadvantages of restricted view and limited field of fire.

The methods of defending the interior of a woods are similar to those employed in night defense. The defense seeks, while holding up the attacking units in front by means of obstacles and specially organized strong points, to break up the cohesion of the attacker's dispositions, take the hostile groups under flanking fire, and counterattack against the flanks. Supports and local reserves are posted with this latter use in view. Full advantage is taken of the opportunities for ambush and surprise.

While the field of fire of flat-trajectory weapons is seriously impaired, the fire of high-angle weapons is not equally affected. Very little clearing will always permit of the use of the latter. Tiers of fire may also be provided and the field of fire extended by posting sharpshooters and machine guns in trees. The use of natural or cleared lanes through the woods assist greatly in the development of flanking machine-gun fire and in detecting and holding up a hostile advance.

RIVER CROSSINGS.

570. Owing to the restrictions which they impose upon movement and maneuver, river lines exercise considerable influence on military operations. They constitute obstacles to an attack and natural lines of resistance for a defense. River crossings require special preparations, both technical and tactical, proportionate to the size of the river and the strength of the command.

571. Attack.—The defenses of a river can sometimes be turned. By demonstrations carried out at various points on the river line attempt is made to deceive the enemy as to the projected point of crossing while the main force turns the hostile flank and effects its transfer to the farther bank before the opponent can readjust his dispositions.

When the enemy is near but not actually holding a river line that must be crossed, effort is made to anticipate him in the possession of the necessary crossings. Cavalry, reinforced when necessary by infantry and engineers in motor trucks, is frequently employed in operations of this character.

When, however, the enemy is already in possession of a river line which can not be turned the crossing must be forced. Hostile advanced troops are promptly driven across the river and preparations to force a crossing are systematically initiated.

572. The crossing of a river line in proximity to the enemy is most frequently effected by ferrying a sufficient force for the establishment of a bridgehead followed by the construction of bridges for the passage of the remainder of the command. Hostile artillery fire and aerial bombardment may make it necessary to effect the entire operation by ferrying. In major operations, the construction of bridges adequate to the passage of motor transportation will ultimately be necessary.

Shallow streams may be forded. In winter troops may cross on ice of sufficient thickness.

573. Data relative to rivers in the theater of operations are contained in maps, terrain handbooks, and monographs furnished to the commander of the field forces on the outbreak of hostilities. These data are supplemented by research conducted throughout operations.

Reconnaissance of river lines across the routes of advance commences at an early stage of offensive operations. Aerial photography showing bridge destructions effected by the enemy and the nature of existing facilities for crossing enables the high command to make an early estimate as to general requirements in matériel. More detailed information is furnished by reconnaissances of staff and engineer officers marching with the cavalry divisions.

Based on the results of these reconnaissances, the available information, and the general strategical and tactical situation, decision is made as to the front or fronts on which the crossing of the river line will be forced. As a general rule, a front is selected on which a successful crossing will so react on the defense of other parts of the river line as to compel a general withdrawal and thus open the way for the passage of the command along the entire front. Crossing zones are assigned to the component large units of the command, and the necessary matériel is placed in readiness. Reconnaissance by division staff and engineer officers furnishes the basis for the selection of the crossing points and the execution of the necessary preparatory measures.

574. In the selection of fronts and points of crossing, consideration is given to both tactical and technical requirements.

Places where the river forms a salient toward the attacking forces favor concentration of fire effect and the delivery of flanking fire against hostile troops occupying the salient; such salients also enable the first troops crossing to secure their flanks by resting them on the river. Ground dominating the opposite bank permits supporting the crossing by overhead fire. Ground on the opposite side of the river over which extended view can be obtained from obesrvation points on the near side greatly facilitates artillery support. The existence of a good bridgehead position on the far side of the river enables the first troops crossing more effectively to execute their mission of covering bridge construction and the passage of the main body. Sites that permit of covered approach favor surprise effects. Connection with the road net on the far side of the river facilitates the progression of troops and transportation after the crossing has been effected; for this reason, old bridge sites are frequently advantageous. Locations which minimize the possibility of interruption of the crossing by means of mines, logs, etc., floated downstream by the enemy are desirable.

Technical considerations bear on the width and depth of the various sections of the river, the character of the current, the nature of the river bottom, the availability in the vicinity of required matériel, the character of the approaches to the river bank, the practicability of fords, danger to be apprehended from ice floes, freshets, etc.

575. Basing his action on the places selected for the crossing and the situation, the division commander directs the preparation of the necessary measures preliminary to the execution of the crossing.

The distribution of the troops depends upon the width of the zone assigned to the division and the number of bridges to be constructed. When the passage of the mass of the division is to be effected by a single bridge, troops are usually distributed into bridgehead troops, supporting troops, the reserve and the engineers, each under a designated commander. The commander of the bridgehead troops assigns crossing zones to his subordinate units.

When the crossing is to be executed on a very broad front by several bridges, or is to be effected entirely by ferrying, crossing zones are assigned to infantry units. Artillery and engineer troops with the necessary matériel are attached to the several units. The commander of each group of all arms thus constituted distributes his troops into bridgehead troops, supporting troops, reserve, and engineers in accordance with the instructions of the division commander; the division commander usually holds out a reserve.

The bridgehead troops consist chiefly of infantry; it is their mission to effect the first crossing and take up a position covering the crossing of the remainder of the command.

The supporting troops consist chiefly of artillery and machine-gun units. It is their mission to hold down the fire of hostile artillery and of hostile infantry holding the river line. The artillery is so emplaced that it can without change of position furnish protective fire to the bridgehead troops during their crossing and occupation of a bridgehead position. Machine guns deal chiefly with hostile infantry holding the river bank. The reserve usually comprises a major portion of the command; it usually crosses by bridges except when the passage of the entire command is to be effected by ferry. It also serves the usual purposes of a reserve; when crossings at several points are attempted, reserve troops are crossed at the points where success has been attained.

Engineers are charged with the operation of the boats and ferries and the construction and guarding of the bridges and the regulation of traffic thereon. (See par. 311.)

Each subordinate commander makes the necessary reconnaissances for the execution of the mission assigned him by the division commander (routes of approach, crossing places, assembly positions preliminary to crossing; battery and machine-gun positions for protecting the crossing; bridge sites, etc.). Engineers take the necessary measures for the collection of the required matériel (boats, timbers, etc.) and its concealment or camouflage.

576. When the necessary preparations have been made, the proper commander gives the order for the execution of the crossing.

Secrecy in preparation and deception of the enemy as to the time and place of crossing are essential.

The occupation of positions preparatory to forcing a crossing usually takes place at night. The various elements of the command are so distributed laterally and in depth that when the first troops have crossed, an orderly progression of requirements in troops and matériel will follow. The successive movement of elements of bridgehead troops from their assembly positions to the boats is so regulated as to avoid massing of troops on the river bank. Measures for the regulation of traffic and the suppression of noises during the approach are of great importance.

In close proximity to the enemy, the situation usually restricts the crossing of the first troops to the hours of darkness; in order to facilitate the advance to the bridgehead position, it is usually best to commence the crossing shortly before dawn.

The bridgehead troops effect their crossing on a broad front; small forces cross simultaneously to selected points on the farther bank and push forward to positions from which they can cover the crossing of other troops. When sufficient forces have been assembled, the bridgehead troops push forward, supported when necessary by the fire of the artillery, to their bridgehead positions. The position finally occupied as a bridgehead is established at a distance from the river sufficient to protect the bridging operations and the crossing of the remainder of the command from undue interruptions and losses from hostile fire. Feint or secondary crossings and demonstrations are frequently employed to divert the enemy's attention from the place where the principal crossing is to be effected and to induce him to divide his forces.

Smoke is frequently used to screen daylight operations and in connection with the execution of demonstrations.

577. Measures are taken to establish signal communications between the advanced message center of the division and elements of the command across the river as soon as practicable.

578. When the enemy holds the opposite bank in force and has organized it defensively, an artillery preparation and support similar to that required in the attack of a defensive position is usually necessary. Provision is made for the early displacement of a portion of the artillery to the opposite bank.

579. The supporting troops make the necessary provision for the antiaircraft defense of bridges.

580. Defense.—A river line may be employed as an obstacle in front of a defensive position or as an aid to counteroffensive action which seeks to strike the enemy while his forces are astride the river.

In the first case, the main line of resistance is placed on or near the river bank. Defenses 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 beginnings. In general, a river line can be employed as a line of resistance only when its course conforms to the requirements of the strategical and tactical situation and sufficient forces are available to provide for a strong defense at the river's edge and at the same time leave available sufficient forces for the usual defensive requirements in reserves. An attempt to hold 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. Holding the river line with inadequate forces leads to general overextension with consequent weakness along the entire line.

Streams constitute the most effective obstacles to tank attacks. The value of a small stream as an obstacle may sometimes be increased by the construction of dams.

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 usually best to hold the mass of the forces in a position in readiness at such distance to the rear that they can intervene at any point where a crossing may be attempted. The river line is then held by relatively weak detachments; stronger detachments with reserves are posted at the most probable points of crossing. The operations of the advanced detachments are organized in accordance with the principles governing outposts. It is their mission to discover hostile crossings and to prevent hostile troops from establishing themselves in bridgehead positions before the arrival of the main friendly forces.

Reconnaissance patrols and detachments are pushed out on the far side of the river.

The mobility of the troops held in a position of readiness is when practicable increased by the assignment of motor transportation.

Artillery occupies positions in rear of the outposts from which it can fire on hostile approaches to the river and effect concentrations against the most probable points of crossing.

Bombardment and attack aviation operate against bridges and troops crossing in boats and ferries.

PART II. ADMINISTRATION.

CHAPTER I.

SUPPLY AND REPLACEMENTS.

GENERAL PRINCIPLES.

581. The commander of the theater of operations organizes his rear in such manner as to meet the needs of the combatant troops and enable them to carry out their assigned missions in the execution of the general plan of operations.

582. The organization of supply and evacuation is controlled by the consideration that it must be capable of adapting itself to the constant and often rapidly changing conditions of military operations. Flexibility, elasticity, mobility, and simplicity are therefore the cardinal principles of the system of supply and evacuation.

Troops must not be encumbered with a greater quantity of supplies and impedimenta than is necessary to assure their mobility and readiness for action. Provision must therefore be made, to the extent that conditions permit, for such an echelonment in width and depth of supply and evacuation establishments as to meet the needs of the troops promptly and in safety.

583. The administration of the supply system is based upon the fundamental principle that the combat troops should not have their attention diverted from their task of defeating the enemy by anxiety concerning questions of supply and replacements. The impetus in the movement of supplies and replacements should be given by the rear which so organizes its services that the normal routine requirements are replaced automatically and without the preliminary of requisitions. Assurance of adequate supply and replacements necessitates prevision of the broadest character, involving calculations on the part of those responsible as to probable requirements incident to the development of operations and as to the time required for supplies and replacements to reach the troops.

584. The accomplishment of the task imposed upon the supply and evacuation system requires careful planning to insure the utilization of available railway transportation facilities at a maximum capacity consistent with efficiency of operation. The available railroad net is utilized as far forward as safety of operation permits; the gap between railheads and the troops is bridged by forwarding columns controlled by the echelon of command within whose sphere of activity they operate (armies, corps, divisions). The forwarding columns of large units form the connecting link between the terminals of railway movement and the field and combat trains which constitute the rolling depots of troop units (regiments and battalions).

585. Supplies are obtained in the theater of operations from two sources, i. e., (*a*) by exploitation of the resources of the theater of operations and captured material; (*b*) by forwarding from the zone of the interior.

It is a fundamental principle that in order to insure freedom of action all supplies and facilities available in the theater of operations should be utilized to the utmost. This is especially true of food and forage.

The utilization to the fullest extent of local supply resources becomes imperative where the theater of operations lies in a country deficient in railroads and waterways.

When the theater of operations is in friendly territory, available resources are used to the maximum consistent with the needs of the civil population. Supplies procured under these conditions are obtained by purchase.

When the theater of operations is in hostile territory, supplies are obtained by purchase or requisition. Requisitions are either direct (foraging) or by systematic collection into depots. Requisitions are resorted to only when authorized in orders of the commander of the theater of operations and are enforced by detachments commanded by commissioned officers. Unauthorized seizure of property is punished as looting. The right to requisition supplies in hostile territory covers the right to employ labor and means of transportation to facilitate delivery and to make use of buildings and establishments. Property obtained by requisition is either paid for or restored with suitable indemnification. If no reason to the contrary exists, better results are obtained when cash payment is made for supplies taken. If the supplies are not paid for upon delivery, receipts are given, copies being retained; these receipts are redeemed in accordance with the instructions of the commander of the theater of operations.

In the interests of the troops themselves, it is well, even in the enemy's country, to treat the inhabitants with consideration. At the same time when the gravity of the situation demands it, due severity may be exercised toward hostile inhabitants who display a spirit of opposition. Leniency and negligence at the wrong time and place may lead to hardships for the troops.

Food supplies gathered by the combatant troops in excess of their needs are taken over by the communications zone.

Under certain conditions, with a view to taking full advantage of available resources in the theater of operations or to exploiting existing resources and establishments to their capacity, it may be advisable to create a purchasing agency to supervise the purchase or requisition of supplies, and in cooperation with the inspection agencies of the services concerned provide for their delivery and payment. This agency should furnish information as to the character of supplies which can be advantageously obtained in the theater of operations with such data concerning time of delivery and other pertinent information as may be necessary to permit of intelligent determination as to the expediency of purchase or requisition.

A well-organized system of purchase and requisition is of great value, but exclusive reliance can not be placed on local procurement even in the most productive countries. Resource must invariably be had to shipments from the zone of the interior.

CLASSIFICATION OF SUPPLIES.

586. For simplicity and convenience of administration, supplies required by troops in the field are divided into four classes as follows:

Class I.—Supplies which are consumed at a relatively uniform rate and which do not necessitate special adaptation to meet individual requirements—subsistence, forage, motor fuel and oils, and articles of a similar nature.

Class II.—Supplies which, though consumed at an approximately uniform rate, are for the personal use of the individual and require special arrangements to meet individual requirements—clothing, gas masks, and similar articles.

Class III.—Individual and organizational equipment prescribed by tables of organization and equipment.

Class IV.—Supplies and equipment for which allowances are not prescribed, articles of an exceptional nature, and supplies and equipment the distribution of which depends upon the conditions imposed by the operations—ammunition, fire-control apparatus, radio apparatus, air service supplies, medical supplies, engineer construction materials.

Supplies and equipment which are normally placed in Class I, Class II, or Class III may, by reason of special stringency, be transferred to Class IV pending reestablishment of a normal status of supply.

Requirements in Class I, II, and III supplies are generally relatively constant. Requirements in Class IV supplies, however, vary between wide limits. At times they are relatively small, then suddenly rise to large proportions, making sudden and heavy demands on means of transportation.

ORGANIZATION AND ADMINISTRATION OF THE COMMUNICATIONS ZONE.

587. General principles.—Troops of any considerable strength can retain their efficiency in operations for short periods only unless there is organized a reliable system for forwarding supplies, the efficacy of which rests primarily on the operation of available means of transportation and the adaptation of their organization and administration to the requirements of changing situations on the battle front.

588. The organization and administration of the supply and evacuation system in the theater of operations and the methods employed depend upon the strength of the forces in the theater of operations; the character of the operations; the distance from the zone of the interior; the capacity, availability, and character of the railroad and road net and its relation to the operations contemplated; and availability of local resources. The situation may consequently require a more or less elaborately organized communications zone or one sufficient only to establish contact with the zone of the interior, the resources and establishments of which are drawn upon directly for the maintenance of the troops.

Whatever the organization, provision must invariably be made for the control by the commander of the theater of operations of a communications zone of sufficient width and depth to provide for the flexibility, mobility, and adaptation to operative requirements of the system of supply and evacuation.

589. The essential requirement in the organization of the communications zone is that it be adapted to the plan of operations and be based on a careful study of the actual conditions in the theater of operations. The communications zone will therefore not be organized in the same manner in every theater of operations; each case will present a different problem, requiring for its solution the application of the basic principles of supply and evacuation to the particular situation.

590. The communications zone is administered through a commander who reports directly to the commander of the theater of operations and is responsible to him for its efficient operation and defense. In the performance of his duties the commander of the communications zone is guided by the principle that the purpose of the organization of his command is to release the combatant forces, as far as possible, from every other concern than that of defeating the enemy and to relieve the commander of the forces in the theater of operations of the consideration of details in order that he may be free to devote his attention to the larger aspects of military operations.

591. Distribution of supply establishments.—Large accumulations of supplies close in rear of the combat troops tend to a rigidity of the entire system rendering it incapable of adjustment to changes in the situation. In order to provide for the necessary flexibility and mobility by adequate echelonment in depth, and at the same time provide for the decentralization necessary to efficient administration and defense, the communications zone may be divided, from front to rear, into three parts—an advance section, an intermediate section, and a base section. The base section is so delimited as to provide adequate facilities for receiving, classifying, assembling, and storing supplies forwarded

from the zone of the interior. In this section are placed the primary repair, supply, replacement, and evacuation establishments required in the theater of operations. The intermediate section, where balanced stocks of all supplies can be accumulated, is delimited at such distance from the front as to be as far as practicable free from danger of hostile interference. This section normally contains no repair facilities other than those essential to the efficient maintenance of means of transportation. The advance section contains establishments of balanced stocks maintained at a level determined from time to time as necessary to meet promptly the immediate needs of the troops in the combat zone; it is so delimited as not to require more than twelve hours for deliveries to railheads in the combat zone. This section contains the first fixed establishment of the evacuation system and the last replacement establishment.

The subdivision of the communications zone in accordance with these principles not only forms the basis for decentralization of administration but also results in such a decentralization of available resources as to admit of greater ease of adjustment to changes in the situation at the front.

Each section is commanded by an officer designated by the commander of the communications zone; section boundaries are prescribed from time to time by the commander of the theater of operations. The functions of the section commander are principally those of an area commander; he exercises no authority over general supply establishments.

If the theater of operations is in the home territory or contiguous thereto, or if geographical conditions do not favor an organization along the lines described, it may be advisable to eliminate the intermediate section or altogether to omit the division of the communications zone into sections. In the latter case, the communications zone is organized as described for the advance section and the classification and assembly of supplies are made in depots of the zone of the interior.

Supplies from the zone of the interior are obtained by the commander of the communications zone either by calling on credits established in designated depots or by requisitioning directly on the War Department. Depending upon the distance of the theater of operations from the zone of the interior, the size of the forces in the theater of operations, the character of the operations and availability of the communications net, supplies received from the zone of the interior are collected into depots of the communications zone or forwarded without transloading direct to railheads of the combatant troops. The latter condition obtains normally only at the beginning of operations in theaters contiguous to the home territory; the movement of supplies is then controlled by regulating stations inserted in the communications net at or near the rear boundary of the theater of operations under the control of the commander of the communications zone.

592. Storage space.—The location, extent, and character of storage facilities in the communications zone and the amount of supplies to be maintained therein depend on the conditions existing in the theater of operations and the facilities for forwarding from the zone of the interior. The determination of storage requirements is an essential part of the original plan of operations. (Appendix IV.)

The commander of the theater of operations, in conjunction with the commander of the communications zone, decides upon the location of all important supply installations and the amount and distribution of supplies. It is the duty of the services to maintain the supplies in the depots of the communications zone at the prescribed level in accordance with the instructions of the commander of the communications zone.

593. Supplies for the theater of operations are primarily stored in the communications zone in depots designated as base, intermediate or advance in ac-

cordance with their location. The number of depots depends upon the extent of the communications zone, its distance from the zone of the interior, the size of the force, and the level at which supplies are to be maintained.

In determining the amount of storage space required for the various depots of the communications zone, it must be constantly borne in mind that the function of all such supply establishments is primarily to provide an emergency source of supplies for the furtherance of operations, increasing in size from front to rear and that within the communications zone certain supplies, such as food, ammunition, engineer materials, etc., at designated depots may, in whole or in part, be placed at the disposition of regulating stations for a definite period of time in order to anticipate the demands of the troops or to fulfill a special service.

594. Storage space in the communications zone is allotted to the services by the commander of the communications zone, who also determines the location of depots, repair establishments, and other supply installations pertaining to each service.

The chief of each service on the staff of the commander of the communications zone keeps adequate records of all storage space occupied by establishments pertaining to his branch, including its disposition and utilization. He makes application and recommendation from time to time for any additional storage space or depots that may be required by his branch in order to meet his responsibilities.

595. Depots.—Storage and issue establishments include base depots, general and branch; intermediate depots, general and branch; advance depots, general and branch. (See par. 605.)

596. General depots are organized into sections corresponding to the several services having supplies stored therein. These sections are designated by appropriate names (e. g., Ordnance Section, Base Depot No. 1).

The chief of each service is charged with the following responsibilities in connection with the storage and issue of supplies at general depots:

The proper storage and issue of supplies pertaining to his branch, subject to the limitations prescribed herein; the maintenance of stocks at the prescribed level; furnishing the technically trained personnel necessary for the proper functioning of his section and increasing or diminishing the number of such personnel as in his judgment becomes necessary; the issuance of such special instructions to his representative at each depot as will insure proper care of supplies and prompt and efficient service; the keeping of records in his office in such form that prompt report can be made whenever directed as to the kind, quantity, location, and condition of supplies on hand assigned to his service for storage and issue, and that the necessary measures can be taken to equalize stocks between depots.

The chief of each service having supplies at a general depot is represented thereat by a commissioned officer designated as depot supply officer (e. g., Ordnance Supply Officer, Base Depot No. 1).

A finance officer, with such assistants as may be necessary, is assigned to each such depot.

A depot supply officer is responsible for—

The proper storage, care, maintenance, and issue of all supplies, equipment, and matériel pertaining to his service under such instructions as may be prescribed by the chief of his service; the control of the necessary technical personnel to handle supplies and supply records pertaining to his service; supervision of the unloading and loading of supplies pertaining to his service, proper marking of all shipments, and transmittal of information in regard to shipments to consignees through prescribed channels. *Under no circumstances will a depot supply officer arrange for transportation except through duly constituted transportation agencies under the supervision of the commanding officer of the depot.*

Whenever any shortage is indicated or anticipated in any article of supply, or the necessity arises for special control of expenditures or reduction of allowances, the depot supply officer brings the matter at once to the attention of the chief of his service; the latter takes the necessary steps to relieve the shortage and reports to the commander of the communications zone, with suitable recommendations, any articles with reference to which special control of expenditures or reduction of allowances is indicated as necessary.

A commanding officer designated as such (e. g., Commanding Officer, Base Depot No. 1) is assigned to each general depot. The depot commander exercises the customary functions of a commanding officer and reports direct to the commander of the communications zone.

In general, it is the function of the commanding officer of a general depot to coordinate the activities of the several depot supply officers while leaving to them the internal management of their respective sections, as prescribed herein. Specifically, the duties of a depot commander are—

Coordination of the activities pertaining to transportation, finance, supplies, and utilities at his depot; supervision of the procurement, utilization, and disposition of all storage facilities connected with the depot; assignment of storage space to the various services having supplies at the depot, in accordance with their needs; reallotment from time to time of storage space to meet the varying requirements of the several services in accordance with instructions of the commander of the communications zone; control of common labor and its allotment to the various sections of his depot (exclusive of labor employed by a depot supply officer in connection with technical work pertaining to his particular service); facilitating, by the efficient management of the common labor retained at his own disposal, the handling of incoming and outgoing freight, and the loading and unloading of cars and other means of transportation; supervision and control of methods of storage so far as safety and proper utilization of the storage space allotted is affected; cooperation in every way with the chiefs of the various services in order that their instructions for the storage and issue of supplies pertaining to their respective branches may be made effective. He is particularly concerned with the efficient management of labor at his disposal, facilitating the prompt handling of incoming and outgoing freight, preventing confusion, and speeding up the turn-around of freight cars and other means of transportation. All orders or requests for shipments of supplies, emanating from any source whatever, are transmitted to the depot commander. In accordance with instructions issued to him by the commander of the communications zone, or received from the regulating station to which his depot is assigned, the depot commander determines priorities of shipments of supplies, makes allotments of cars or other means of transportation, and by proper utilization and coordination of transportation agencies at his disposal *expedites the movement of supplies toward the front.*

597. The organization and administration of branch depots are the responsibility of the chiefs of the several services to which the depots pertain. The commanders of such depots are assigned by order of the commander of the communications zone on the recommendations of the chiefs of the services concerned. General supplies are stored in branch depots in such amounts and for such periods as may be prescribed by the commander of the communications zone.

598. The maintenance of stocks of Class I, Class II, Class III, and Class IV supplies in the base, intermediate, or advance depots is the responsibility of the chiefs of the several services on the staff of the commander of the communications zone. The chief of each service is immediately responsible for his depots and establishments in the communications zone. It is his duty to anticipate the needs of the troops and submit his recommendations as to establishments and supplies required for the operation of his service, and after approval or in com-

pliance with established policies to maintain appropriate stocks of supplies at the various depots. With the approval of the commander of the communications zone, changes in these projects and in the various lists of supplies are made from time to time to correspond with the varying phases of the operations.

599. When a depot can not supply all articles called for on a requisition, it forwards such articles as may be available. The remainder of the request is extracted to the proper chief of service; for supplies of Class I, Class II, and Class III the extract is transmitted by telegraph, radiogram, or telephone, and the chief of service at once takes the necessary steps to have the necessary supplies forwarded to the depot. For supplies of Class IV, the chief of the service makes issue at once from any other depot at which the supplies are available, or if the required supplies are not in stock initiates the necessary measures to procure and deliver them. He notifies the depot of his action and takes steps to maintain the stock if the articles in question are of such a nature as to indicate future demand. Chiefs of services, when authorized by the commander of the communications zone, may keep the entire stock of classes of articles of which the supply is limited at one or more designated depots; other depots forward or extract thereto requests for these supplies in the most expeditious manner.

600. When supplies are issued from depots to establishments or troops or for construction work in the combat zone, or are transferred from one service to another, the receiving officer receipts for the supplies with a notation showing the organization or the work for which the supplies or materials are to be used. No further formal accounting for the supplies or materials is required from the receiving officer. The same care is taken of all equipment, supplies, and material, and the same economy in their use is observed as in cases where a formal accounting is required. Commanders are charged with insuring that neither men nor organizations of their commands waste or misuse the supplies, material, and equipment furnished to them, or accumulate a surplus thereof. Organizations or individuals demanding much in excess of the average amounts required by other like units under similar conditions are investigated and appropriate action taken.

601. Units in the communications zone obtain their equipment and supplies in accordance with detailed regulations prescribed by the commander of the communications zone based on the following general principles:

Articles of Class I, Class II, and Class III are issued by depots on duly approved requisitions made direct to them. All requisitions show amounts on hand; excess over the authorized allowances is not asked for.

Requisitions for equipment of Class IV supplies, including those for construction work, are submitted to the chief of the service concerned, who, after approval, sends them to the proper depot for issue. Credits for material for approved construction projects may be placed at the disposition of the officer in charge of such projects. In authorizing credits and in making drafts upon depots for supplies for troops in the communications zone, due care is taken to protect the interests of troops in the combat zone; instructions to that end are issued by the chief of each service for the guidance of his establishments.

602. Copies of all orders and instructions of a general nature issued by the chief of any service for the government of his establishments are forwarded to the commanders of the communications zone and the theater of operations for their information.

603. It is a principle of issue that a unit should receive all the equipment or material *intact, assembled and from one source* necessary for the performance of a functional duty. For example, army engineer troops are charged with the construction and maintenance of roads within specified limits; certain tools, equipment, and supplies are necessary for this purpose; some of these supplies are special supplies pertaining to the Corps of Engineers; others are general

supplies pertaining to the Quartermaster Corps. The officer charged with the road construction or maintenance requisitions direct on the Chief Engineer of the Army for all supplies required; the latter assembles the supplies and provides for their delivery to the requisitioning officer.

604. Defense of the communications zone.—Troops are assigned to the commander of the communications zone for its defense and police and the protection of lines of communication.

The commander of the communications zone distributes the defense troops among the several sections of the communications zone; the troops assigned to the several sections are placed at the disposition of section commanders for the defense and police of their sections.

Section commanders have no control over movements of personnel, animals, or matériel over the lines of communications, except in case of imminent danger from the enemy. They are then responsible that such measures are taken as may be necessary to insure the uninterrupted movement of traffic, or, if interruption is unavoidable, that traffic is stopped until, in their opinion, it can be safely resumed, or until orders from superior authority are received. They at once report action taken to the commander of the communications zone.

Troops, animals, supplies, or matériel of any kind in movement to the front are not diverted for the use of troops on duty in the communications zone except by authority of the commander of the theater of operations.

When armored trains are used, their crews form part of the command of the communications zone and operate under the orders of section commanders. Armored trains are so operated as not to interfere with railroad traffic except in the face of imminent danger from the enemy.

TERMINOLOGY OF SUPPLY POINTS.

605. *Balanced stocks:* An accumulation of supplies of the class and quantity determined as necessary to meet the needs of troops for a fixed period.

Depot: A storage point for supplies involving storage facilities of a permanent, semipermanent, or temporary character. Depots are classified as—

(*a*) General or branch, depending upon the character of supplies stored therein.

(*b*) Base, intermediate, advance, and army, depending upon their location and the function they perform in the supply system.

General depot: A depot containing supplies pertaining to more than one service.

Branch depot: A depot containing supplies pertaining to but one service.

Base depot: A general or branch depot, designated as such by the commander of the theater of operations, located in the base section of the communications zone for the reception and storage of supplies received from the zone of the interior or procured in the base section.

Intermediate depot: A general or branch depot, designated as such by the commander of the theater of operations, located in the intermediate section of the communications zone, for the storage of supplies of balanced stocks forwarded from base depots or procured in the intermediate section. Intermediate depots are established only when the depth of the communications zone is such that it is essential to provide an additional echelon in the distribution of supplies.

Advance depot: A general or branch depot, designated as such by the commander of the theater of operations, located in the advance section of the communications zone, for the storage of supplies of balanced stocks forwarded from base or intermediate depots or procured in the advance section for issue to the armies. Supplies stored in advance depots are reduced in quantity below those in intermediate depots and base depots and are maintained at a level necessary to meet the anticipated essential requirements of the armies for a comparatively short period of time.

Regulating station (Appendix V): An agency of the commander of the theater of operations through which the movements of troops and supplies between the combat and communications zones are controlled.

Railhead (Appendix V): A point on a railroad at which supplies are discharged and at which they are transferred direct to field and combat trains, or from which they are forwarded to relay or refilling points.

Navigation head: A point on a navigable waterway corresponding to a railhead.

Relay point (Appendix V): The point to which supply columns placed at the disposition of an army by the communications zone are forwarded from the railhead when the distance between the railhead and refilling point is too great to be spanned with the transportation normally at the disposition of the army. Relay points are temporary forward extensions of railheads by means of transportation placed at the disposal of the army.

Refilling point (Appendix V): The place at which the supplies are transferred to the supply columns of divisions and nondivisional (army and corps) troops.

Distributing point (Appendix V): The place at which the supplies are distributed to the field and combat trains of the troops.

Army depot: A branch depot, designated as such by the army commander, located in the army area, for the reception and temporary storage of supplies that the situation demands be kept closer at hand than is possible in the advance section of the communications zone, and for the storage of supplies requisitioned in the combat zone. Supplies maintained in the army area are ordinarily limited in character to those essential to maintain combat efficiency and in quantity to that required to meet the needs of the army for a period not exceeding three days.

Corps park: A place for the temporary storage of supplies, designated as such by the corps commander, located within the corps area, where the reserve supplies normally carried on the corps trains are stored during periods when it is necessary to use the vehicles of the corps trains for other purposes. Supplies so stored are generally limited to ammunition and engineer construction materials, and do not ordinarily exceed in quantities the capacity of the corps trains. In stabilized situations the quantities of supplies so stored may be increased.

Division dump: A place for the temporary storage of supplies, designated as such by the division commander, located within the division area, where the reserve supplies normally carried on the division trains are stored during periods when it is necessary to use the vehicles of the division trains for other purposes. Supplies so stored do not normally exceed the capacity of the division trains. In stabilized situations the quantities of supplies so stored may be increased.

TRANSPORTATION (APPENDIX V).

606. General principles.—The transportation system within the theater of operations may include one or all of the following means: Rail, road, water, and air.

Rail transportation is usually a controlling factor in military operations; all other means of transportation are usually supplementary thereto.

Road transportation includes motor truck and wagon transportation, supplemented in special cases by pack and tractor transportation.

Water transportation includes all means for movement by sea and inland waterways.

Air transport includes all means of transportation by airships or airplanes. In the theater of operations its use is ordinarily limited to emergency transport of mail, ammunition, staff officers, couriers, and possibly small detachments.

607. The adequacy of the supply and evacuation system is primarily dependent upon the efficient organization, administration, and operation of the available

means of transportation. Efficiency of operation requires adherence to the following principles: There must be but one and only one agency charged with operation of each of the several means of transportation; there must exist a centralized control of all transportation agencies in order to secure their proper cooperation; operation of the several agencies must be decentralized in order to secure flexibility and mobility. The first essential of the supply and evacuation system is an adequate communications net of which standard-gauge railroads form the skeleton; the standard-gauge system is supplemented and expanded by roads, waterways, and, under conditions favorable to their employment, narrow-gauge railroads. The several components of the communications net constitute the lines of communication.

608. Flexibility and mobility in the use of the communications net are obtained by the insertion of control points (regulating stations, see par. 609), at or near the rear boundary of the combat zone, and, when necessary, at the rear boundary of the theater of operations; the reservation of lines perpendicular to the front for supply and evacuation purposes and of those parallel to the front for troop movements; and the employment of a unit-type train for the supply of the requirements of the combat troops in food and ammunition.

609. **Regulating stations.**—Each regulating station serves a definite area of the combat zone delimited on the basis of the available lines of communication. If conditions permit, these areas should be coincident with the army areas of the combat zone; traffic conditions and availability of lines of communication may, however, be such as to render a further subdivision necessary. Under any condition, the area served should be under the control of a single authority.

610. Regulating stations are the most important elements in the organization of the transportation system. They are the nerve centers of the communications net, the neck of the bottle of the system of supply, and the means of maneuver of supply and troops in rear of the combat zone. On these stations fall the responsibility for the maintenance of regularity of supply, the smooth movement to, and evacuation from, the combat zone, and the avoidance of congestion at railheads.

611. The installations of a regulating station consist essentially of receiving, classification, and dispatching tracks, and facilities for the storage and handling of certain supplies called regulating-station reserves. These reserves normally consist of articles of food, forage, and ammunition necessary for one day's supply of the troops in the area served. Additional facilities may be provided at regulating stations when the transportation situation renders it necessary to make provision for meeting emergency needs beyond the capacity of the reserve normally provided. When possible, regulating-station reserves are kept on wheels in readiness for prompt movement, i. e., maintained as a rolling reserve.

The unit train for food and forage is based on personnel and animals, and the unit ammunition train upon calibers.

612. In a shifting military situation, regulating stations may be established at points where the necessary trackage already exists or can be quickly installed. Provision is made by planning and reconnaissance for prompt advance of regulating stations.

613. A regulating station should, when possible, be situated at the junction point of several routes leading from the various depots and installations in the rear from which supplies and replacements are drawn; two or more separate routes should lead to the area which it serves in order to insure that there will be no interruption of traffic in case one line becomes blocked for any cause. It should be linked with other regulating stations so that while furnishing the means of regulating and directing movements in and out of the combat zone, it can also maneuver traffic laterally. It should be capable of caring for forward, rearward,

and lateral movements with a flexibility that will insure the utmost freedom of action to the commander of the theater of operations. Regulating stations should, if possible, be located near enough to the front to enable trains to arrive at railheads in 12 hours.

614. The regulating officer commands the station and all installations thereat for the operation of which the use of trackage or of routes leading to the front is necessary. He is a direct representative of the commander of the theater of operations, who assigns him a suitable staff representing the various services.

The regulating officer is responsible for the systematic and orderly movement of supplies and reinforcements from the regulating station to the front and for the evacuation of men, animals, and matériel from the railheads to rear. To him are sent all orders for, and information regarding, the transportation of men, animals, and matériel to and from the areas assigned to his station. He is advised in ample time of proposed changes at the front that affect supply operations, in order that he may make appropriate dispositions accordingly. He coordinates the activities of service representatives at his station, determines the amount of the regulating-station reserves and priority of shipments, and makes allotment of cars and drafts for supplies on depots in the rear, based on calls from the command he serves.

615. Intensive exploitation of lines of communication in the combat zone renders them extremely sensitive to any congestion. As perfect a regulation of traffic as possible must be maintained if they are to be ready at all times to meet the great demands placed upon them by changing conditions of battle, which may necessitate the hurrying forward of large quantities of ammunition, the bringing up of fresh troops to some threatened point of the front, the transfer of troops from one section of the front to another, and an increase in the number of sick and wounded to be evacuated. At the same time, the regular flow of food, forage, and motor fuel must continue without interruption. The necessity for meeting each of these various demands requires the establishment of a priority which can be enforced without loss of time and is capable of modification to meet the constantly changing conditions. Priorities in movements from rear to front are fixed by the regulating officer pursuant to the demands of the command that his station serves. All calls for supplies, all notices and requests for troop movements, and all requests for evacuation are sent to the regulating officer who, in accordance with these advices, controls the flow of supply and movements from front and rear.

616. Railheads (Appendix V).—At or near each railhead are maintained limited quantities of stores for emergency use, and, depending on transportation facilities, one or more day's supply of rations, forage, fuel, gasoline, and other articles of approximately uniform daily consumption from which supply columns or field trains of the combat troops may be filled without holding them for the arrival of belated railway trains. Drafts made upon these stocks are replenished from supplies brought up from the rear. Daily report is made to the regulating officer as to stores on hand. Effort is made to maintain balanced stocks of ration components.

617. Railheads are agencies of the regulating station. Each railhead is commanded by an officer who is directly responsible to the regulating officer for its efficient operation. The railhead commander is charged with the reception, unloading, custody, and delivery of all supplies received at his station. He is warned by the transportation officer as to the probable hour of arrival of trains, makes arrangements to unload them with utmost dispatch and returns them without delay to the regulating station. He is responsible for the sanitation and orderly appearance of his station and all grounds adjacent thereto. Precaution is taken to keep clear the loading places and the ground near the tracks or roads. No

facilities that are not essential to the operation of the station as such are established in its immediate vicinity. Care is exercised to keep supplies segregated by classes and so arranged as to facilitate prompt loading into vehicles of the supply columns and to permit in and out circulation.

618. The officer in charge of a railhead has associated with him as his subordinate an officer of the railway service to assist in matters of railway operation. In all matters of railway operation, this officer reports to and receives his orders from his division superintendent. He endeavors by all means within his power to expedite the movement of supplies, the release and turn-around of rolling stock, and the clearance of the railhead.

619. The mechanism of the communications zone (Appendix IV) with its depots and other establishments all closely bound together by lines of communication feeding into the several regulating stations, together with the regulating stations, has as its sole object the regular delivery of supplies, replacements, and reinforcements to the railheads. When the commander of the communications zone has delivered to the regulating officer the supplies which he has called for, his responsibility concerning them ceases; similarly, the responsibility of the regulating officer ceases when he in turn has made the supplies available for issue at the proper railheads.

620. The principles underlying the operation of regulating stations are applicable when the deficiency in rail communications in the theater of operations makes it necessary to employ motor or animal transportation in the supply operations of the communications zone.

In order to meet the conditions so imposed, motor or animal-drawn columns are organized within the communications zone and forwarded through regulating stations established at points best located to meet the needs of the combat troops while insuring their freedom of action. Under these conditions, regulating stations are pushed as far forward as safety permits.

In any case, regulation of traffic conforms to the principle set forth herein that it is the function of the communications zone to advance all lines of communication forward to a point or points where contact can readily be made with the supply columns of the large combatant units.

621. Relay points.—Each relay point is commanded by an officer directly responsible to the army commander. His responsibilities in respect to the movement of supply columns are in general similar to those of a railhead commander in respect to railway train movements; he has also similar responsibilities in respect to the command of his station. He takes especial measures for the regulation of the movement of supply columns at the relay point. No vehicles pertaining to the supply columns of the troops are permitted to enter the station until the vehicles of the supply columns arriving from the railhead have been unloaded. When possible, movements are so timed that the columns from the rear and those from the front arrive at different hours. Supplies are segregated as in the case of railheads. He is assisted by an officer of the motor transport service who, under his direction, controls the movements of the supply columns operating between the railhead and the relay point.

622. The military railway service.—The organization of the rail and water transportation in the theater of operations departs from civil practice in that greater provision is made for flexibility, especially in the forward areas and that the nature of the service, including equipment, management, and structures, is governed by expediency rather than by economy and permanency.

While the service is technically under centralized control, it is subject to the demands of various military authorities as regards transportation to be furnished. The commander of the communications zone controls the transportation system within the communications zone up to the railheads. The regulat-

ing officer controls the transportation of supplies and personnel between the regulating stations and the railheads. The system of rail and water transportation is able, through the flexibility of its organization, to meet these requirements and the demands consequent to frequent and sudden changes in military operations. Operation divisions in the transportation lines are self-contained, in so far as operation and maintenance are concerned. Due to the character of the service, roadbed, and equipment, and the requirements of flexibility in the system, divisions are shorter and more numerous than is usual in the operation of commercial railroads.

In an extensive theater of operations where railway lines are numerous, lines may be divided into grand divisions, the limits of which are determined by the military situation, the railroad traffic, and the geographical location of the existing railways. Each grand division is under charge of a general superintendent, and is divided into two or more divisions, each under charge of a superintendent.

623. Commercial railway lines in friendly territory continue to operate under their respective officials whenever the military situation permits, provided they are efficiently operated and maintained and render satisfactory service. Officers of the military railway service are assigned to each of such railways as information officers and as assistants of their officials in handling matters of a military nature.

624. The construction, maintenance, and operation of railroads in the theater of operations is a function of the Corps of Engineers.

625. The director of railways in a theater of operations is an officer of the Corps of Engineers. He is assisted by a general manager of railway operations, an engineer of construction and maintenance, and a personnel officer. The organization and operation of separate lines and divisions follow the principles employed by commercial railways.

The director of railways is in charge of the construction, operation, and maintenance of all standard-gauge railways in the theater of operations, and is in command of all personnel assigned to duty with the railway service.

A division superintendent is when practicable assigned to each regulating station and to the headquarters of each section of the communications zone.

The division superintendent at a regulating station is a member of the staff of the regulating officer. He is responsible for the movement of cars in accordance with military requirements, as indicated to him by the regulating officer. He commands the railway personnel pertaining to the station, provides and maintains rolling stock and other equipment required, and generally controls all questions of a technical nature relating to railway operation.

Each division superintendent is represented at all depots, railheads, and important railway stations by officers of the military railway service who expedite the movement of troops and supplies at all points and assist the military personnel traveling on the railways in every possible way.

626. The railway operating personnel consists of engineer troops organized for this service. Personnel of commercial lines taken over by the military authorities may be employed on such lines, provided the organizations and personnel can be relied upon to operate and maintain their lines effectively.

627. All railway construction, including the extension of railway lines to the front or the construction of a large amount of trackage in rear areas, is executed by the Corps of Engineers. The plans are prepared by the engineers under the direction of the commander of the theater of operations. The plans of each army commander and the commander of the communications zone with reference to extensions and reconstruction of railways are coordinated with the general plans for railway construction in the theater of operations.

628. The Corps of Engineers arranges with the Signal Corps for the necessary wire circuits for train dispatching and for the administration of military railways; such circuits are operated by the Corps of Engineers. The upkeep of wire circuits allotted exclusively for operating military railways is a responsibility of the Corps of Engineers, and is carried out by engineer personnel. The upkeep of wire circuits that are used partly for the operation of military railways and partly for other communication purposes is a responsibility of the Signal Corps, and is carried out by signal corps personnel. Wire circuits turned over to the railway service exclusively for railway business are not available for other purposes, except by specific authority of the proper commander in each case.

629. Light railways (light, narrow-gauge lines, operated by power, horse or hand) are used as a supplementary means of transportation between a standard-gauge railhead and the combatant troops in a stabilized situation and in connection with construction projects carried out in the theater of operations. Such railways are usually of a gauge less than 3 feet and employ light matériel and equipment. They are in the nature of an expedient and are useful only for limited hauls; their principal use is to supplement animal and motor transportation. They are operated under the control of the commander within whose sphere of activity they are employed. Light railways perform valuable service on stabilized fronts where hostile fire prohibits the use of the extensive working parties and equipment that highway construction and upkeep demand. The operation and maintenance of narrow-gauge lines in the delivery of large quantities of supplies and material follow closely the principles of railway operation and maintenance. The construction, operation, and maintenance of light railways in the theater of operations is a responsibility of the Corps of Engineers.

630. **Inland waterways.**—Inland waterways in the theater of operations are operated by the Corps of Engineers in general accordance with the principles governing railway operation.

The organization of terminals connecting railway and waterway carriers is important. Arrangements at inland-waterway terminals for transfer to rail transportation are, in general, similar to those at ports where connection is made between railway and marine transportation. Waterways are through lines and do not therefore require the subdivisions necessary in railway operation. Navigable rivers and canals are of great value in relieving the congestion on roads and railroads. Due to the comparative slowness of transportation by these means, their principal value lies in the transportation of heavy bulk materials, as fuel, road materials, etc., and in the evacuation of sick and wounded.

631. **Sea transportation.**—Water transportation, other than that on navigable rivers and canals and involving the employment of shipping on sea and lake areas included in the theater of operations, is a function of the transportation service and is supervised and controlled by an officer of the transportation service on the staff of the commander of the communications zone. Such transportation is in general used for the transfer of bulk supplies between depots of the communications zone or for the movement of large bodies of troops. It is not operated as part of the transportation system of the communications zone; it may, however, serve as a means of connecting one communications net with another or as a connecting link between parts of the same communications net. When a seacoast is included within the theater of operations, sea transportation may be of great service in relieving the communications net of large movements by transporting supplies and troops between ports.

632. **Motor and animal transportation.**—Motor transportation constitutes the normal equipment of supply columns pertaining to the communications zone and supply columns and trains pertaining to the army and corps; exclusive of special vehicles, motor transportation is not organically assigned to the division.

633. The extent to which motor transportation can be used depends primarily upon the character and conditions of roads in the theater of operations. Whenever and wherever possible, this class of transportation should be employed to the maximum, due to its capacity for longer hauls, greater loads, and economy of maintenance as compared to animal transportation. In the extension of the supply system beyond railheads, every effort should be made by forward planning for the preparation of available roads for motor traffic. As far as practicable, provision is made for the use of motor vehicles for transportation from railheads to refilling points.

634. The use of motor transportation requires a carefully planned and strictly enforced system of circulation and traffic control, so organized that the circulation in the zones of armies and corps is integrated into a common system from the railheads to distributing points. As the impetus in forwarding supplies must be given from the rear, the circulation must be regulated by the highest echelon of command in the combat zone.

635. Effort is made to limit transloading to the minimum by the institution in the army of a common system of circulation. In view of the fact, however, that army supply columns usually transport supplies in bulk, redistribution of supplies on a divisional basis generally requires transloading to the animal-drawn divisional supply columns at refilling points. The detailed distribution necessary in the issuance of supplies to troop units generally requires transloading at distributing points.

Exceptionally, extension of the lines of communication may require the introduction between relay and refilling points of echelons of corps trains.

636. When the distance between the railheads and the troops exceeds a day's journey of animal-drawn transportation, army supply columns are advanced to refilling points so situated as to permit ready contact with the supply columns of divisions and nondivisional troops. Refilling points are moved forward corresponding to the movement of the troops up to a distance not exceeding one day's journey of motor transportation from the railhead. From the refilling points the supply columns of divisions and nondivisional troops move forward to distributing points so situated as to permit ready contact with the field and combat trains of the troops and not more than one-half day's journey from the troops. From these points, field and combat trains move forward to their units; during combat they may push forward at night close behind the leading troops.

637. In order to insure the maximum utilization of all motor and animal transportation available within the theater of operations, the assignment of vehicles to organizations is limited to those necessary to meet the immediate needs of the command to which they pertain; the remainder is pooled in corps and larger units in such numbers as the commander of the troops in the theater of operations may direct.

The amount of transportation assigned to any organization should be sufficient to meet its ordinary transportation requirements and to maintain its supply at such a level at all times as to insure its readiness for action and freedom of movement; it is determined by consideration of the character of the operation, the capacity of available railroads, and the nature of the terrain.

The purpose of transportation pools is to retain at the disposal of each echelon of command a reserve of transportation available for meeting the requirements of the command as a whole and for establishing between each echelon and its subordinate units the connections necessary to insure the movement of supplies between the forward extension of the communications zone and the combatant troops. To meet these requirements, it is necessary that the commander of each higher echelon foresee future needs and make provision therefor.

The allowance of transportation for the several units, together with the amounts of rations, forage, and ammunition to be carried by them, is prescribed in tables of organization, equipment, and basic allowances.

638. The commander of the communications zone maintains and operates the motor transportation placed at his disposal by the commander of the theater of operations, as a pool, organizing it into operating units which he assigns throughout his command so as best to meet the needs of its various agencies and subdivisions. The motor transport pool is operated under the supervision and control of an officer of the motor transport service on the staff of the commander of the communications zone. Its primary use is to supplement the railway and waterway systems of the communications zone when the latter are unable to meet demands and to supply local transportation needs of the various agencies and installations of the communications zone.

639. Motor vehicles are preferably to be employed on surfaced roads and for covering long distances. Their efficiency under these conditions is about three times that of animal-drawn transportation. When necessary, motor vehicles must be able to cover 100 to 180 miles a day, depending on the weight of vehicles. Intensive use rapidly reduces the effectiveness of vehicles and consequently the capacity of the columns. The ordinary rate of travel in order to reach maximum effectiveness and extended use without extensive overhauling is from 8 to 14 miles an hour. Motor vehicles require one, and during very heavy movement, two, or three overhauling days a week. It is best to overhaul complete units at a time in order to keep units intact and to permit of supervision by unit commanders.

640. The effectiveness of motor transportation is favorably influenced by the following measures:

Standardization of vehicles by the utilization of the fewest possible makes and types; proper operation and inspection of vehicles; the maintenance immediately at hand of light repair facilities capable of making small repairs and adjustments, thereby forestalling extensive breakdowns; establishment of overhaul facilities where more seriously damaged vehicles may be turned in for repairs and a serviceable vehicle of the same make and type issued as a replacement; installation of reconstruction facilities in the communications zone capable of manufacturing parts and of rebuilding vehicles; making available an adequate supply of spare parts and tools within reach of the combat units; providing a well trained and disciplined personnel.

641. Tractor transportation may be used for long hauls in open country, particularly in the movement of supplies to localities which on account of difficult terrain conditions are inaccessible to other means of transportation. Tractors find extensive use in assisting other means of transportation over difficult stretches of roads or country before the repair or construction of suitable roads is practicable.

642. Animal transportation is adapted to movement on all classes of roads and temporarily across country; it is usually necessary to reduce the loads in cross-country movements.

The employment of animal-drawn vehicles is indicated wherever the situation requires that transportation be incorporated in the march columns of the troops or immediately follow them. When necessary, animal-drawn transportation may be depended upon to cover 30 miles a day for short periods. The ordinary rate of travel to insure maximum effectiveness should not exceed 3½ miles an hour.

Pack transportation finds especial application in mountainous country and on trails. Its most important general use is in connection with the cross-country supply of troops in combat, especially over shell-torn or other difficult terrain impassable for other forms of transportation. It may be depended upon to

cover 30 miles a day for short periods. When the animals are led, the rate is the same as that of infantry. The ordinary rate of travel in order to reach maximum effectiveness should not exceed 4½ to 5 miles an hour.

643. When practicable, motor and animal transportation should not be mixed. The best roads should be used for motor traffic and the poorer roads for wagon and pack transportation. When it is impracticable to assign separate roads to each class of transportation, mutual interference is avoided by echeloning their movement in time, and by so regulating traffic circulation that passage of the motor columns or trains can take place at designated places.

644. The commanders of all transportation units must be impressed with a strong feeling of responsibility at all times. They must be prepared to make every exertion to insure that their columns or trains reach their march objective at the time specified. Extreme privation, night travel, and excessive distances must not be avoided when necessary to supply the troops with ammunition, food, and other requisites to their efficiency in combat or on the march.

645. The service trains of a large unit comprise its supply columns (including ammunition and subsistence columns), engineer trains, field hospital and ambulance units, ordnance companies, and other transportation elements pertaining to a particular arm or service which ordinarily follow the combatant troops or their field trains on the march.

To permit of the formation of groupings constituted on the basis of the order of the employment of their several elements, service trains may for march purposes be divided into echelons.

A commander is designated for the control of the movement of the service train. When elements of service trains are required for operation by the unit to which they pertain, they are released from the service train by order of the commander of the troops and directed to report to their unit commanders.

THE ISSUE OF SUPPLIES.

646. **Methods of issue.**—Class I supplies (Appendix VI). The daily supply of forage, fuel, and rations is automatic and is based on the actual strength of the organization in men and animals, or on experience tables for gasoline, oils, and similar articles. Strength reports are furnished daily by corps, divisions, and army troops to army headquarters. Army headquarters thereupon notifies the regulating officer as to the number of men and animals of each division and nondivisional unit belonging to the army and the railheads from which they are to be supplied, and at the same time gives him such special information as may be necessary to meet the requirements of the situation.

The regulating officer may call upon the depots supplying his station to forward the necessary automatic supplies in one of two ways, viz: (1) By directing supplies to be made up into trains for through shipment to specified divisions or supply groups; or (2) by calling for shipment of supplies in bulk.

647. Class II supplies (Appendix VII). The distribution of articles in this class is based on the actual strength in men and animals of the troop units and records of sizes maintained by the regimental supply officers and determined by experience. Issues are simplified by the publication to troops of schedules, giving the tariff of sizes upon which requisitions can be based. Troop units furnish necessary data as to sizes to the division quartermaster, who consolidates them and keeps them reasonably up to date by requiring reports at stated intervals. Whenever supplies are required, the division quartermaster prepares a consolidated requisition for the division and submits it to army headquarters where it is filled by the proper army supply officer from stocks in the army depots. Any portion of the request which can not be filled from sources

at the disposal of the army is forwarded by the army to the regulating officer for supply from a depot of the communications zone, previously designated to furnish articles of the character required. The depot fills the request to the nearest unit package. Original packages are not ordinarily broken. The depot commander informs the regulating officer of the projected shipment, and the latter establishes an order of priority and gives such other instructions as may be pertinent.

For the supply of combatant units in a stabilized situation, troops in training or units serving under other favorable conditions, certain articles of this class of supplies may be placed on a semiautomatic basis in accordance with experience gained as to rates of consumption; shipments may thus be made on dates agreed upon in advance, due allowance being made for variations in strength.

648. Class III supplies (Appendix VIII). Requests for this class of supplies are transmitted by units to the supply officer concerned, who fills them from any stores at his disposal. If the division supply officer can not fill the request, he forwards it, showing unfilled balances, to the army, where it is filled by the proper army supply officer from supplies held in army depots. If any portion of the request can not be filled from sources at the disposal of the army, the request, showing portions unfilled, is then forwarded by the army to the regulating officer for supply from a depot of the communications zone previously designated to furnish articles of the character required; the procedure thereafter is as heretofore described for Class II supplies.

649. Class IV supplies (Appendix IX). Requirements for articles of this class are handled in the manner described for those of Class III, except that after the articles available within the army have been furnished, the request, showing portions unfilled, is forwarded direct from the army to the headquarters of the forces in the theater of operations where appropriate action is taken.

650. Rail shipments.—A list of contents invariably accompanies each car. For supplies shipped in closed cars, the list is tacked in a conspicuous place inside the car near the door; in the case of open cars, it is placed in a durable envelope and tacked to the underside of the car near the center in a place protected from the weather. In all cases, notices of shipment containing necessary information as to car numbers, contents, weights or quantities, and the consignee are transmitted to the regulating officer by the depot commander or other shipping officer in time to reach the regulating station not later than the arrival of the cars. The notice of shipment contains reference to the identification or file number and the items on the requisition or order to which the shipment applies.

651. Whenever articles are to be shipped from depots in less than carload lots, they are properly marked with the name of the ultimate consignee, placed with similar small shipments destined for other units in the same command, and forwarded by the regulating officer to an army depot or railhead designated by the army. No car will contain supplies furnished by two or more services except in the case of less-than-carload-lot shipments. Loading slips placed in the cars give all data necessary to insure delivery to the unit making the original request.

652. Credits.—In order to expedite the supply of articles of any class and to reduce necessity for sending formal requisitions to the headquarters of the theater of operations, certain quantities of supplies stored in depots may be placed at the disposal of an army for a definite period of time. These supplies are, after allotment, subject to draft on demand directly from the army. The purpose of allotting credits is to assure the army concerned of a definite amount of supplies for the period stated, and at the same time relieve it from the necessity of caring for them in army depots. The commanders of the depots at which stores are

located thus become warehousing agents for the army for the amount of supplies covered by the credit allotment. Upon receipt of drafts from the army for supplies covered by credits, the depot commander arranges through the proper regulating officer for the necessary transportation. One copy of each draft against the credit is sent by the army to the regulating officer. By arrangement between the army and the regulating officer, orders may direct shipment in carload lots at a fixed rate for a number of days; the railway division superintendent takes action to secure the rolling stock required.

At the end of the period named in the credit allotment, all undrawn balances revert to depot stock, but on request made prior thereto a new credit may be arranged for the next succeeding period. Copies of credit allotments are forwarded to army headquarters, to the regulating officer, and to the depot commanders and chiefs of the services concerned. The latter make arrangements to meet drafts on the credits established.

Army headquarters may, at its discretion, and if the situation permits make similar credit allotments of supplies in army depots to subordinate units and establishments.

653. Requisitions.—Requisitions will be consolidated for the largest troop unit or by divisions, and should normally be filled from supplies actually on hand or at the disposition of the various headquarters. Only under exceptional circumstances should requests be forwarded for action to higher authority while subordinate agencies still have supplies at their disposal from which such requests may be filled.

654. No requisition should include articles issued by two or more services, nor when it can be avoided will articles of different classes be listed in the same request. If practicable and not inconsistent with the conditions of service, all requisitions for divisions and corps and army troops are forwarded in triplicate and bear a serial file number. The serial number is prefixed by an abbreviation indicating the service which issues the supplies covered by the requisition.

The various items in each requisition are also numbered consecutively. When approved by competent authority, two copies of requisitions for supplies to be furnished by the communications zone are sent to the regulating officer and one copy is retained by the army; the regulating officer transmits one copy to the proper depot of the communications zone with the necessary shipping instructions. All copies are clearly marked to show the fact of approval and the approving authority. After action on the requisition, the depot may, if so directed by the chief of service, forward its copy to him for his information. All inquiries and correspondence concerning supplies make reference to the requisition and its number.

Whenever a requisition can not be completely filled, the approving authority or depot supply officer supervising the issues makes notation on the requisition as to the action that may be expected in respect to articles which can not be supplied, and the headquarters of the army to which the requisition pertains is so notified. Arrearages on requests will not be allowed to accumulate. Prompt action on every request must be taken by all officers through whose hands it passes.

Organizations will not duplicate on requisitions articles which they have called for on previous requisitions until they have received notice that such articles have been stricken from previous requisitions.

A reasonable period must be allowed for transmission of requisitions and for delivery of supplies.

The responsibility and the necessity for requisitions and their sufficiency and accuracy rest with the regimental or other similar commander; the final responsibility rests with the division commander.

Corps and army troops send their requisitions direct to corps and army headquarters respectively. In the case of these troops, the procedure to be followed for each class of supplies is as above outlined for the division.

Strict adherence to formality or insistence on the use of special forms in requisitioning supplies is avoided. Requests for supplies made in any manner by those responsible for filling the supply needs of troops engaged in active operation are honored.

655. Ammunition supply.—Requirements in ammunition being based on tactical considerations, ammunition supply must be so organized and administered as to meet constantly changing and often suddenly increasing consumption. The distribution of ammunition must therefore be based on reports covering short periods of time, showing its status in the various echelons of command.

656. A supply of ammunition (Class IV supplies) is made available to the army by the commander of the theater of operations in the form of credits in depots of the communications zone, subject to its call. (See par. 652.)

By call on the regulating officer, the army regulates the distribution and forwarding to subordinate units. Distribution may be made direct from railheads to the troops, or through the intermediary of army depots. The latter method provides the surest and most efficient means of assuring the supply. The stocks maintained in army ammunition depots should normally never be less than that necessary for the replacement of the total amount carried by all lower echelons for weapons of all calibers. Prompt replenishment of ammunition expenditures of the troops requires that stocks be maintained by the communications zone in readiness for immediate forwarding and in a sufficiently advanced location to insure arrivals of shipments at railheads not more than 12 hours after receipt of call therefor. If transportation conditions are such as to make forwarding of ammunition within this time limit uncertain, stocks in army depots must be increased commensurately with the uncertainty of supply, even to the extent of overstockage; arrangements are made with the commander of the communications zone for taking over surplus stocks as the advance progresses or for their destruction by the combatant troops in case of withdrawal.

657. The following principles govern reports and replacements of artillery and infantry ammunition; the details involved in the application thereof are determined by the character of, and conditions imposed by, battle, but the underlying control indicated must always be present:

Artillery ammunition (Appendices X and XI): Daily reports of ammunition expenditures are forwarded by regiments to the artillery brigade commander; the latter consolidates and forwards the reports, in the case of divisional and corps artillery, to the corps artillery commander, in the case of army artillery, to army headquarters. Corps forward consolidated reports of expenditures of subordinate units to the army. Based on these reports and on reports as to the status of ammunition in army depots, allocation of ammunition is made by the army to its several units in sufficient quantities to replace expenditures or to establish stocks for contemplated operations. The corps reallocates to divisions or moves the ammunition forward to corps parks for distribution to divisions. The division allocates and distributes to regiments, regiments to battalions, and battalions to batteries. Allocations are forwarded from army depots to refilling points in accordance with the principle heretofore prescribed for the movement of supplies from railheads to refilling points. If conditions permit, ammunition railheads and refilling and distributing points should be separate from corresponding points for the forwarding of other supplies. Army depots are usually located at or near refilling or relay points.

Ammunition of different calibers should not be mixed, either in storage or in movement; different calibers are segregated in depots and among units of rail, motor, or animal transportation by complete rounds.

Infantry ammunition (Appendices XII and XIII): The principles governing the supply of artillery ammunition also apply to the supply of infantry ammunition, except that consolidated reports of expenditures covering periods determined by the character of the operations are forwarded by the ordnance personnel of divisions and corps to army headquarters.

658. Army ammunition depots and corps ammunition parks are administered by ordnance personnel. Divisional artillery ammunition is administered by artillery personnel. The operation of the system of ammunition supply within the corps is controlled by the corps commander who makes proper allocation for that purpose of the transportation available to the corps; sufficient means are made available to corps and divisional artillery brigade commanders and infantry brigade commanders to enable them to operate the supply within their commands.

When the conditions of the operations permit or require accumulations of stocks over and above that normally carried in the several echelons, care is exercised to prevent large accumulations in one place. Such accumulations are separated by caliber in order to facilitate issue and are so distributed as to limit possible destruction by enemy fire.

SALVAGE.

659. The prompt salvage of equipment and matériel which are partially worn out or abandoned on the battle field and in camps and bivouacs, together with the exploitation of captured matériel, makes available considerable quantities of supplies for issue to the troops and lightens the burden on the lines of communication incident to the transportation of supplies from the rear.

660. A salvage service, comprising an adequate number of salvage units, is organized in the theater of operations for the purpose of collecting and sorting all abandoned and unserviceable property. In principle, salvage operations in the combat zone are organized and executed under the direction of army headquarters; during periods of stabilization, corps and division commanders may be made responsible for salvage operations within their commands.

661. Salvaged property is collected at points so located as to permit of its transportation by empty vehicles moving to the ear. Articles which can not be placed in serviceable condition by facilities at the disposition of the army and which are not needed by the army for reissue to troops are evacuated to railheads.

Arms and equipment of the sick and wounded are collected at hospitalization establishments and turned over to the salvage service.

In order to insure the proper sorting of salvaged property, it is essential that the several services be represented by competent personnel at points where salvage is collected.

Salvaged property not required in the army is evacuated, as rapidly as conditions of the operations permit, to designated depots of the communications zone, or, if the theater of operations is contiguous to the zone of the interior, to designated depots of the zone of the interior.

TRAFFIC CONTROL.

662. The heavy and continuous traffic to which roads in the theater of operations are subjected requires a complete and thorough regulation of traffic circulation. Movements of motor and animal transportation must be coordinated in such a manner as to utilize to the maximum the available road capacity, whfle at the same time taking full advantage of the capabilities of the different means of transportation.

663. In order to assure efficiency in the system of supply and evacuation and in troop movements, traffic must be regulated by a plan of circulation based upon a thorough study of the capacity and conditions of available roads. The fewer the roads and the poorer their condition the greater the necessity for a carefully planned system of circulation and a strict traffic control. Efficient traffic circulation necessarily involves disciplinary control through the application of regulations and orders governing its operation in each particular situation; such regulations and orders form a part of all plans of operations.

664. For purposes of supply and evacuation, traffic circulation forward and rearward is regulated with reference to the location of the fighting front and the supply and evacuation establishments upon which the operations are based. The plan of circulation must conform to the principle that the requirments of the combat troops predominate. Troop movements can not always be planned so as to conform to an existing system of traffic circulation, but are in the main determined by the action of the enemy, or other circumstances, distance and time being normally the controlling elements. Tactical necessity may demand the utilization of roads without regard to the circulation enforced for supply and evacuation purposes. The control of traffic within the prescribed circulation must therefore be such that prompt adjustment to meet the changed conditions necessitated by movements of troops can be effected without delay or confusion.

665. The efficient operation of the system of supply and evacuation involves such a combination of railroad transportation with the movement of heavy traffic on roads as to derive the greatest advantage from the possibilities of the communications net.

666. The necessity for adapting the supply and evacuation system to changes in the situation at the front and for coordinating transportation by road and by railroad requires a centralized regulation of traffic circulation. In the combat zone, such regulation is primarily a function of army commanders; each subordinate commander (corps and division) so organizes and regulates traffic within his command as to conform to the system prescribed by his immediate superior.

667. The principal measures for the regulation of traffic comprise: Reservation, when practicable, of separate roads for motor and animal transportation; where such reservations are made impossible by insufficiency of suitable roads, allotment of different hours for use by the several means; rigid and impartial enforcement of traffic regulations and march discipline; reduction to the minimum of the crossing of traffic currents; erection and maintenance of legible and readily understood traffic signs; provision for circuits on one-way roads; the organization and subdivision of the road net for purposes of construction and maintenance; assignment of military police units for enforcement of regulations and orders governing the circulation.

PERSONNEL REPLACEMENTS (APPENDIX XIV).

668. A plan for the organization, training, and forwarding of personnel in sufficient numbers to maintain all troops in the theater of operations at full strength at all times is a basic necessity in the preparation of any plan of operation.

The preparation of the replacement plan, including the number of replacements estimated as necessary, is a function of the zone of the interior; the commander of the theater of operations is, however, materially concerned, and must make representations as to his requirements if necessary.

Personnel replacements include all personnel destined to replace losses or to bring any unit up to its prescribed strength.

Before being forwarded to a theater of operations, replacements are thoroughly trained, clothed, equipped, and appropriately armed.

669. The replacement system in the theater of operations must be sufficiently flexible to meet the local needs and to assure an unfailing and timely arrival of replacements where needed.

Replacements, like supplies, are echeloned in depth. The number of echelons depends mainly on the depth of the theater of operations. As a rule, two echelons are provided—the division replacement battalion and the army replacement battalions. Base and advance replacement depots may be established in the communications zone if necessary.

670. Sources of replacements comprise the zone of the interior; evacués in the theater of operations who, as a rule, are automatically returned to their former organizations; the personnel returned to an assignment status from absence without leave; prisoners upon completion of sentence; officers upon reclassification; and others who for any reason become available for assignment.

671. Replacements are forwarded upon requisition. A company requisitions on the regiment, the regiment on the division. A division fills the requisitions in whole or in part from replacements available in the division replacement battalion and makes requisition on the army for the part or parts of requisitions which it is unable to fill. Corps requisition directly on the army. The army fills in whole or in part the requisitions which it receives from replacements available in the army replacement battalions; it draws on the communications zone for the part or parts of the requisition which it is unable to fill. Credits may be established for the theater of operations by the War Department in depots in the zone of the interior upon request of the commander of the theater of operations.

672. Replacements are forwarded to their organizations in the theater of operations by the most convenient means available; by rail, motor, or water transportation, or by marching. Forward movements beyond railheads are normally executed by marching.

Replacements may be forwarded directly from the zone of the interior to divisions in the theater of operations, to the army replacement battalions, or to the base or advance replacement depot. They may be forwarded from the latter to the army replacement battalions or to divisions; or from the army replacement battalions to divisions. Replacements for corps and army troops are forwarded in a similar manner. The method selected is that which is the most convenient and practicable, depending upon the situation and the character of the operations.

673. Priority in the forwarding of replacements to the army is established by army headquarters. Where two or more armies are served by a common communications zone, the next higher headquarters under which the armies directly operate establishes priority.

In the forwarding of replacements by railroad, regulating stations function in the same manner as in the shipment of supplies for the commands which they serve. Priority of movement to the army is determined and coordinated by the regulating station under instructions from the army.

ANIMAL REPLACEMENTS (APPENDIX XV).

674. Animal replacements include all animals necessary to replace losses or to bring any unit up to its prescribed strength.

The general sources of animal replacements comprise the resources of the theater of operations; the zone of the interior; and reconditioned or recovered animals in the theater of operations.

Resources of the theater of operations in animals should be exploited to the utmost so as to reduce forwarding of replacements from the zone of the interior. Sick and wounded animals are seldom evacuated from the theater of operations

and only from the combat zone when the military situation makes it necessary or facilities in the army are insufficient to insure reasonable care and opportunity for treatment. Effort is made to replace losses within the army by recovered or reconditioned animals to the extent that such animals are available in the army.

Before being forwarded from the zone of the interior, animals should, if practicable, be fully conditioned for service.

675. The system of animal replacements, as in replacements of personnel, must be sufficiently flexible to meet the local situation and to insure timely arrival of replacements when needed.

The establishments necessary for the handling of animal replacements are echeloned in a depth corresponding to the depth of the theater of operations. They comprise the corps remount depot, the army remount depot, and such base and advance remount depots in the communications zone as may be necessary.

676. The detailed method of requisitioning animal replacements conforms to the method prescribed for personnel replacements, except that requisitions of divisions and corps troops are forwarded to corps remount depots.

677. Animal replacements are forwarded to units in the theater of operations by rail or water transportation, or by marching; movement beyond railheads is normally executed by marching. Replacements may be forwarded directly from the zone of the interior to corps remount depots, to army remount depots, or to remount depots of the communications zone. They may be forwarded from the latter to army remount depots or to corps; or from the army remount depots to divisions. Replacements for corps and army troops are forwarded in a similar manner. The method selected is that which is the most convenient and practicable, depending upon the situation and the character of the operations.

The principles governing priority in the forwarding of personnel replacements to the army apply also to animal replacements.

CHAPTER II.

HOSPITALIZATION AND EVACUATION.

GENERAL PRINCIPLES.

678. The object of the evacuation and hospitalization system is conservation of man power to the end that the forces may be maintained at maximum strength for combat. This is accomplished by the adoption of effective measures for preservation of the health of the troops and prompt return to duty of those who have been disabled, the methodical classification, distribution, and care of the sick and wounded according to their condition, and the relief of troops from the necessity and difficulty of caring for casualties.

679. Commanders of all units are responsible for the efficient operation of the evacuation and hospitalization system within their organizations. The operation of the system is a function of medical department personnel and units. The surgeon of each organization commands the medical personnel and units pertaining to his organization as a whole, and coordinates, supervises, and supplements the activities of the medical service of subordinate organizations through the proper channels of command. The veterinary service is a part of the medical department and under the direction of the veterinarian of each organization is charged with the treatment, evacuation, and hospitalization of animals. (See pars. 709–722.)

680. Commencing at the front (Appendix XVI), a constant sorting and classification of casualties is carried into execution with the primary object of retaining in forward establishments those capable of performing duty with their commands at an early date, and of sending to hospitals in the rear where they can receive the best care those not offering prospects of early recovery. To this end, all cases which can perform duty and are not a menace to the health of the command are returned to their organization; no cases are sent farther to the rear than the military situation and their own condition demand; cases which can be successfully treated locally are not evacuated unless it is necessary to relieve the unit of their care in order to free it for movement or to make room for new cases; serious cases are transported only the shortest possible distance consistent with the military situation and their proper treatment, in order that their chances for recovery may not be unduly jeopardized; cases requiring prolonged treatment are sent to the communications zone or to the zone of the interior as soon as their condition will permit.

681. The medical personnel attached to each unit cares for and collects the casualties within the area of the unit. Evacuations from the area are carried out by the rearward echelons. Medical personnel and units accompany at all times the organization to which they pertain. When necessary, casualties are left to be picked up by units in the rear.

682. Hospitals in the combat zone are kept sufficiently clear of patients to permit of the reception of new cases and to leave them free for movement. During periods of activity casualties are evacuated rapidly through the advance hospitals to the communications zone. In periods of inactivity the evacuations are less numerous and less rapid.

683. Medical establishments are set up for operation only as required for the situation as it exists or as foreseen to meet contingencies of the immediate future. Establishments not required for such purposes are held in reserve where they will be readily available to meet emergencies as they arise.

684. In the execution of evacuation and hospitalization, the demands of the military situation are paramount, and the basis of decision as to details of operation is the greatest good to the greatest number.

Plans and orders for evacuation and hospitalization are made in conformity with, and in amplification of, combat plans and orders.

Proper execution of evacuation and hospitalization requires that the medical service of the unit be informed of plans and orders in ample time to enable it to make the necessary arrangements.

685. The general plan for evacuation and hospitalization within the theater of operations is prepared by the chief surgeon in accordance with the general policy prescribed by the commander. General supervision remains in the hands of the commander of the theater of operations, but operation is decentralized to his various subordinates: all fixed hospitalization to the commander of the communications zone, in which the general hospitals are located; the initial evacuation and temporary hospitalization to army commanders; and to the regulating officer, the evacuation by rail from the combat zone to the communications zone.

686. The evacuation and hospitalization system normally covers five main echelons of activity, the regiment, the division, the army, the communications zone, and the zone of the interior.

MEDICAL SERVICE IN COMBAT.

687. The regiment.—The medical personnel attached to regiments is, for purposes of command, grouped in one detachment and forms an integral part of the regiment. When desirable, a section of the regimental detachment is attached to each battalion and a section to regimental headquarters.

Preparatory to combat, a portion of each battalion section is attached to each company, accompanies it into action, and maintains close contact with it. The duties of the company subsection are to apply first aid to all casualties, direct those able to walk to the rear, appropriately mark the points where casualties are assembled, and so far as practicable place them under shelter from fire along the axis of advance. It is frequently necessary for a casualty to apply the first-aid packet or have it applied by a comrade.

The remainder of each battalion medical section establishes a battalion aid station at a designated point. This station is located as near as practicable to the combat echelon. At this station, the battalion medical section assembles casualties, gives them temporary care, and prepares them for transportation until they are taken over by other agencies in the rear, normally a bearer platoon from a sanitary company of the medical regiment. When the troops advance, the aid station is moved forward in such a manner as to cover the zone of action of the battalion.

688. The medical section with regimental headquarters establishes a regimental aid station in the general vicinity of regimental headquarters. This station, usually the first established and the least frequently moved, is the headquarters from which contact is maintained with battalion medical sections and from which they are reinforced. Casualties occurring in the vicinity and immediate front of headquarters are here assembled and given temporary care; when exceptionally the special situation demands, this station becomes a link in the chain of evacuation. When necessary, the regimental medical personnel is reinforced by the band personnel, which is placed at the disposition of the surgeon and used in combat mainly in collection of casualties. With this exception, the collection and care of casualties devolves entirely upon the medical personnel. No combatant, unless duly authorized, is permitted to accompany casualties to the rear, and none of the regimental medical personnel goes farther to the rear than the regimental aid station.

689. The division.—The division utilizes the various elements of the medical regiment to establish collecting stations, ambulance stations, and hospital stations for the collection and temporary care of casualties.

690. Collecting stations are points at which casualties are collected and given the necessary primary treatment prior to further evacuation. In the normal case, one collecting station is established by a company of the sanitary battalion in rear of each infantry brigade. Collecting stations are located at points on practicable ambulance routes, near the normal route of wounded, to the rear, and 1 or 2 miles from the front lines. From this station, bearer platoons of the sanitary companies make contact with the battalion and regimental aid stations and search the field in their rear, carrying or directing casualties to the collecting station or to points in advance thereof accessible to ambulances. During an attack collecting stations are moved forward to cover the zone of action of the brigades.

691. Ambulance stations are points established for the administration and control of ambulance companies and the regulation of the movement of ambulances from front to rear, and vice versa. One ambulance station is usually established by a company of the ambulance battalion somewhat to the rear of each collecting station. From this station ambulances are sent forward to the collecting station as needed for the routine evacuation of the station. Whenever practicable, ambulances are employed in advance of the collecting station, taking over casualties direct from aid stations or from bearer platoons of the sanitary companies at intervening points, for transportation to the collecting station and from the latter to the hospital station.

692. Hospital stations are established by hospital companies of the hospital battalion. Whenever possible, hospital stations are grouped in one place; the situation may, however, require them to be widely separated. They are usually located from 3 to 6 miles from the front lines on or near the routes of evacuation. Here casualties are received, sorted, and given temporary care and treatment. Some cases are returned to the front for duty with but little delay, others evacuated to the rear at once, and others held for necessary treatment preparatory to further evacuation. Hospital stations are not intended for the treatment of those cases known as "nontransportable."

693. The corps.—The corps utilizes its medical service to furnish the necessary medical assistance to corps troops; to supervise, coordinate, and supplement the operation of divisional medical personnel; and in rare instances to augment the medical service of the army. It is not normally a link in the chain of evacuation unless acting independently, in which case its medical service functions in the same manner as that of an army. When acting independently, the medical service of a corps is usually augmented from army medical units, particularly those pertaining to surgical and evacuation hospitals.

694. The army.—The army utilizes its medical service to direct the evacuation and hospitalization system throughout the army area, to furnish the necessary medical attendance to army troops, to reinforce the medical service of corps and divisions, and to provide for the movement and hospitalization of casualties between the hospital stations of divisions and the rear boundary of the army area.

695. The army ambulance and sanitary battalions, assisted in emergency by trucks or other available transportation, evacuate surgical hospitals and all hospital stations of divisions, corps, and the army to evacuation hospitals; transport patients from evacuation hospitals to the convalescent hospital, if established, and assist in the loading of hospital trains. Elements of the medical regiments may be used to establish emergency evacuation stations when required by the situation. Emergency evacuation stations may be located on railways

in advance of evacuation hospitals for the purpose of receiving and loading patients directly on railway trains or boats for evacuation farther to the rear.

696. Surgical hospitals are established on routes of evacuation in the immediate vicinity of division hospital stations, from which they receive nontransportable or other serious cases, thereby freeing the divisional units for the reception and care of transportable cases or for movement, and providing early facilities for immediate surgical aid of a suitable character to the seriously wounded who cannot withstand transportation farther to the rear. Surgical hospitals are mobile units of the army, but in operation usually function under corps supervision.

697. Evacuation hospitals are established on railways, whenever possible, at a distance of from 8 to 16 miles from the battle front. They provide facilities for the care of all classes of casualties and serve as centers from which evacuations from the combat zone to the communications zone are carried out. Evacuation hospitals are mobile units of the army.

698. Convalescent hospitals, located well to the rear of and central to the army area, receive from evacuation hospitals slight, convalescent, and other cases offering prospect of early restoration to combat fitness. Their function is to hold these cases under army control in order that they may be returned to duty at the earliest practicable date. Army convalescent hospitals usually find employment only in stabilized situations.

699. The evacuation of patients from the army area is effected by means of hospital trains or improvised railway transportation, by barges and other means of water transport, and, when necessary, by motor transportation.

MEDICAL SERVICE IN THE COMMUNICATIONS ZONE.

700. The communications zone furnishes facilities for evacuation from the combat zone and provides hospitalization for all cases originating within the communications zone or received therein from the combat zone. The amount and distribution of hospitalization is determined by the necessities of the particular theater of operations. The bed capacity ordinarily provided approximates 15 per cent of the strength of the forces in the theater of operations. All cases that will probably be able to return to duty within a reasonable length of time are held until cured. The more seriously disabled are held until their condition and the facilities at hand permit their evacuation to the zone of the interior. Establishments of the fixed type only are utilized in the communications zone.

701. Station hospitals are provided for the local care of troops in the communications zone, and general hospitals for all definitive hospitalization in the theater of operations. General hospitals are established on or near main lines of communication or on branch lines radiating directly from regulating stations, at places selected in accordance with general policies enunciated by the commander of the theater of operations.

702. Evacuation from the communications zone to the zone of the interior is effected by agencies of the zone of the interior and is initiated by the commander of the communications zone in accordance with policies of the War Department and the headquarters of the theater of operations.

MEDICAL SERVICE IN SHELTER.

703. In shelter, the sick and injured are usually examined and treated at battalion or other dispensaries. Those requiring evacuation are held until collected by an ambulance from regimental headquarters. The disabled are, after collection, transported to the place designated for their treatment, which in permanent camps is the station hospital pertaining to the camp, and in tem-

porary camps where no fixed hospitalization has been established is a hospital station established by the hospital battalion of the medical regiment serving the division. Further evacuation and hospitalization, when required, is effected as described above under combat.

MEDICAL SERVICE ON THE MARCH.

704. On the march, medical units are placed in the column in such position as to best serve the troops while marching and to be readily available in the event of combat. Animal-drawn ambulances are attached to regiments and similar units for service during marches. March collecting stations are established by the sanitary battalion along the route of march. Casualties from passing troops are collected at these stations and evacuated to a hospital station, hospital, or other designated point by an ambulance company. (See par. 309.)

705. In a retreat, every effort is made to evacuate all casualties, but when this is impracticable, the minimum necessary medical personnel and establishments are left with the sick and wounded under protection of The Hague convention.

MEDICAL SERVICE IN CAVALRY COMMANDS.

706. The general principles of evacuation and hospitalization apply to cavalry as well as to other branches. The rapidity of movement of cavalry commands and the small proportion of attached medical personnel often make it necessary, however, to send a large proportion of casualties to the rear on their own mounts or in improvised transportation. It is also often necessary to leave casualties in the care of local inhabitants with or without medical personnel. Evacuation from cavalry commands always requires close support from the rear. Army units are utilized in providing the necessary supporting echelons of evacuation and hospitalization.

PROTECTION OF MEDICAL PERSONNEL AND ESTABLISHMENTS.

707. All medical personnel, mobile and fixed medical units or establishments, chaplains, and Red Cross personnel and establishments are protected under the provisions of the Geneva Convention. Neutralized personnel in uniform wear a red cross on their left arm properly stamped by competent authority. When concealment is not necessary, medical establishments display the red cross flag or emblem by day and a green light at night. Suitable ground markers in the form of the Greek cross are laid out for the information of enemy airmen.

VOLUNTEER AID.

708. After authorization and notification under the provisions of the Geneva Convention, the services of the American Red Cross, its equipment, and its personnel are utilized in accordance with existing orders to the greatest extent possible in the care of sick and wounded soldiers. Ordinarily these services are not utilized in advance of the communications zone.

EVACUATION AND HOSPITALIZATION OF ANIMALS (APPENDIX XVII).

709. The system of evacuation and hospitalization of animals has the same objective, is governed by the same general principles, and in detail of operation closely parallels that already described for personnel, with the exceptions below noted.

At all points in the movement of disabled animals from front to rear, the question will arise as to whether immediate destruction or evacuation is indicated. All animals incurably sick or wounded and all cases of serious communicable disease unable to walk, or for which transportation is not available,

and which are a menace to well animals will be destroyed without delay on the advice of a veterinary officer after personal examination.

710. The regiment.—The veterinary personnel attached to regiments and similar units applies first aid to disabled animals, conducts those able to walk to the rear, placing them under shelter from fire, and as soon as practicable assembles at the veterinary aid station those suitable for treatment or evacuation.

711. The veterinary aid station, normally one per regiment or similar unit, is established by the attached veterinary personnel at or near the point where the unit animals are assembled. This personnel provides all care and treatment required by casualties at the aid station. Animals fit for immediate duty are returned from the aid station to the unit to which they pertain and those requiring evacuation are taken over by the divisional veterinary company. No veterinary personnel of the regiment goes farther to the rear than the aid station.

712. The division.—The veterinary collecting station, normally one per division, is the point at which the animal casualties are assembled, given primary treatment and necessary care, and sorted for further evacuation or immediate destruction or return direct to the unit from which they came. It is established and operated by the personnel of the veterinary company of the division. The collecting station is so located as to cover conveniently the position of the mass of animals, usually at a distance of from two to three miles from the front line. From the collecting station, detachments make contact with the veterinary aid stations and search the field in their rear, conducting animal casualties requiring evacuation to the collecting station and caring for them en route. The personnel of this company does not operate farther to the rear than the collecting station.

713. The army.—The army veterinary companies establish special collecting stations as required to meet the needs of troops not otherwise provided for. Such stations are located in advance of the veterinary evacuation hospital.

714. Veterinary evacuation hospitals receive casualties from the collecting stations and carry on like functions to those of evacuation hospitals of the medical service; no convalescent animals are returned direct to units but are evacuated to the convalescent hospitals when the latter are established. All other cases requiring further evacuation pass to the veterinary general hospitals of the communications zone. Veterinary evacuation hospitals are located in accordance with considerations similar to those governing the location of medical evacuation hospitals; they should be accessible from the front by road. Available buildings are utilized as shelter.

The veterinary evacuation hospital is organized in two sections, an evacuation section and a hospital section. The evacuation section of the veterinary evacuation hospital conducts casualties requiring evacuation from the collecting stations to the evacuation hospital and from the latter to the veterinary convalescent hospital. Evacuations from the evacuation hospital to the convalescent hospital and to the veterinary general hospitals of the communications zone are effected by stock trains or by evacuation columns of led animals. Facilities and personnel for evacuation to the communications zone are furnished by the communications zone at the request of the army or by the army veterinary companies.

715. A veterinary convalescent hospital when assigned to an army is located in accordance with principles similar to those governing the location of a convalescent hospital of the medical service. Its chief function is to receive slight and convalescent cases from the evacuation hospitals and to issue them to the army remount depot when fit for duty. Its personnel provides for all necessary care and treatment for patients and furnishes parties for conducting animals to the army depot. Under normal conditions, the convalescent hospital issues practically all its animals to the remount depot. Evacuation from convalescent hospitals is restricted to exceptional and special cases requiring definitive treat-

ment. As in the case of convalescent hospitals of the medical service, they find employment normally only in stabilized situations.

716. The communications zone.—The veterinary service of the communications zone meets requirements paralleling those of the medical service in a similar manner, except that final treatment is completed within this zone and the evacuation of animal casualties to the zone of the interior is not contemplated.

717. The veterinary station hospital provides veterinary service for the animals of camps, rest points, regulating stations, independent depots, etc. It is evacuated to the veterinary general hospital when necessary.

718. The veterinary general hospital is established on or near main lines of communication and provides the final stage of hospitalization for animal casualties. It is fully equipped for all classes of definitive treatment. In the event that mange or other serious communicable disease affects many animals, general hospitals may be advanced to suitable points within the communications zone and set aside for the reception of separate classes of such cases as required. The general hospital disposes of its convalescent cases to the convalescent camp, its cured cases to designated remount depots of the communications zone, and its incurable and unserviceable patients through the operation of rendering plants or like salvage utilities or by sale to civilians.

719. The convalescent camp is a communications zone unit designed to handle convalescents from the general hospitals and to issue them to proper depots when fit for duty.

720. Veterinary service in shelter and on the march.—In shelter, disabled animals are examined and treated at the veterinary dispensaries of regiments or like units. In temporary shelter, minor cases which do not impede the movement of the troops remain at the dispensary. Severe cases are collected by ambulance or detachment from the veterinary company, furnished with extemporized hospitalization, and evacuated as required to the most convenient veterinary hospital establishment.

721. On the march, the veterinary company is so distributed in the column as best to serve the needs of mounted units. Its personnel establishes march collecting stations from which casualties are evacuated to designated veterinary hospital establishments. Under proper conditions, such cases may be left in the care of local inhabitants. Slightly disabled animals are examined without delay by a veterinary officer who determines whether they should be relieved of rider, parts of equipment, etc., and led with the unit or relieved of all work and turned over to the veterinary company for care and treatment, or receive other suitable disposition. The commander concerned is notified of the disposition made of the animals.

722. In a retreat, special effort is made to evacuate or otherwise dispose of disabled animals; when necessary, they are destroyed. Neither the veterinary personnel nor the animal patients are neutralized under the Geneva Convention, and the latter, if captured and capable of early restoration to serviceability, become a military asset to the enemy.

CHAPTER III.

MILITARY POLICE.

723. Military police are charged with the enforcement of all police regulations in the theater of operations. They maintain order throughout the area or areas occupied by the organizations to which they have been assigned; protect the inhabitants of the country and their property against violence and prevent excesses of all kinds; enforce traffic control; supervise the travel of military and militarized personnel; apprehend deserters and absentees; and collect all stragglers and hand them over to their organizations.

They relieve combat organizations promptly from the custody of prisoners of war and conduct them to places where they are ordered assembled.

In conjunction with interior guards established by combatant units, they protect railroads, telegraph and telephone lines from damage by the native population, keep hostile inhabitants in order, carry out their disarmament, and cooperate with the military intelligence police in the execution of counterespionage measures.

724. The military police assigned organically to divisions and higher units normally suffice for the police of the combat zone. For the policing of the communications zone, units of military police are organized and assigned in such numbers as may be required.

Commanders of the military police at army, corps, division, section, district, or other headquarters where military police units are assigned are designated as provost marshals and their subordinate officers as assistant provost marshals.

725. In addition to the duties pertaining to general military police, the provost marshal general of the theater of operations is charged with the reception, care, disposition, and security of all classes of prisoners. He makes records of prisoners of war, and collects and records the tags taken from the enemy's dead, as required by the laws and usages of war. The records of prisoners of war and of the enemy's dead are transmitted, as soon as completed, to the Prisoner of War Information Bureau established by the Adjutant General's Department.

726. In cases of emergency, the military police may call upon any troops to assist them. All persons belonging to the military service are required to give every assistance to the military police in the execution of their duties.

727. Officers and enlisted men, when performing the duty of military police, wear a blue brassard on the left arm halfway between the elbow and shoulder bearing the letters "M. P." in white.

728. As a rule, military police on duty will not be reprimanded or placed in arrest except by the superiors under whose command they are serving. In exceptional cases, field officers and officers of higher grades are authorized to order their arrest. Members of the military police when not on duty have no special privileges.

CHAPTER IV.

CENSORSHIP.

GENERAL PRINCIPLES.

729. Censorship within the theater of operations is controlled by the commander of the field forces who establishes and enforces such detailed regulations with respect thereto as the situation may require.

730. The main object of censorship is to prevent the leakage of military information. Seemingly trivial details may, when assembled, furnish information of the highest importance and actually determine the result of battles.

731. Censorship applies to private communications, photography, and press dispatches, publications, and communications.

All private communications (post cards, letters, parcels, telegrams, radiograms, etc.) of officers, soldiers, foreign attachés, press correspondents, and all other individuals, originating in the theater of operations, are subject to censorship and to such delay in transmission as may be deemed necessary by the military authorities. A censor is authorized to suppress any statement which might be of value to the enemy or prejudicial to the welfare of the forces in the field.

All newspapers or journals in the theater of operations or in localities where martial law is in force are likewise subject to censorship; if necessary, their publication may be suppressed.

CORRESPONDENTS.

732. Conditions of acceptance.—Each applicant to accompany the field forces will present to the Secretary of War credentials from the owner or owners, managing editor, or responsible manager of the publication or publications he represents, giving a brief account of his career, stating exactly the nature of the work he is expected to do at the front, certifying to his trustworthiness as a working member of his profession, and his personal fitness to accompany the field forces. He shall take an oath of loyalty of the usual military form and shall agree to abide in letter and spirit by all the regulations laid down for his guidance. If at any time the number of correspondents becomes so large as to be an encumbrance, the Secretary of War will refuse other passes until such time as he deems expedient, when other applicants who fulfil the conditions will be received in the order of their application.

Not more than one correspondent will be received for any one publication or syndicate of publications or press association with the same army.

In addition to the requirements for home correspondents, a foreign correspondent must present credentials as to his character, and accompanying the letter from his employers, a letter from his ambassador in Washington personally vouching for him.

All correspondents will submit to the medical regulations in force in the theater of operations.

733. Photographers.—All members of the military forces in the theater of operations are forbidden to take photographs unless photography is a part of their duties. Official photographers and correspondents or others duly authorized to take photographs will be provided with written permits. All photographs will be sent to the Signal Corps field laboratory for development where all pictures will be censored. No photographs, negatives, or prints will be released unless so ordered by the censor. Prints released by the censor will bear his stamp, and released negatives will be accompanied by suitable identification slips; a record of all such releases is kept. The United States reserves the right to make copies of all photographs for official and historical purposes.

734. Facilities for work.—The press correspondents who are duly accredited by the War Department and attached to the armies in the field are charged with the duty of keeping the American public informed of the activities of the field forces. The fact that they are under military control and that all matter written by them must be submitted for censorship must not be permitted to obscure the great importance of their work; it is essential that the activities of the field forces be as truly and promptly represented to the people at home as the military situation will permit. Every reasonable facility and assistance should be extended them to enable them to obtain all proper information for the efficient performance of their duties. They are given transportation over military railways, with the privileges of a commissioned officer, and arrangements made for the field transport of their baggage with that of the headquarters to which they are attached. The official military wires will be open to correspondents' dispatches when such use is not inconsistent with military needs. Dispatches will be sent in the order of filing. The censor may limit the number of words or otherwise make an equitable adjustment of the use of the wire among the correspondents when the lines of information are unequal to carrying all the dispatches submitted.

735. Messenger.—A correspondent may, if he so chooses, employ a messenger. The latter may not, however, send any dispatches of his own. Any infraction of the regulations regarding censorship by the messenger will be considered as equivalent to an infraction by the correspondent himself. Messengers must have credentials acceptable to the military authorities and a pass in the correspondent's form, with the privileges of an enlisted man.

736. Passes.—Every correspondent and civilian photographer will be supplied with an official pass, bearing his photograph and his own signature and the signature of the Secretary of War. Upon receipt of this pass, he will proceed to the headquarters of the field forces to which assigned and there report himself to the commander thereof. At the headquarters of the field forces, he will be provided with such additional pass and identity card as may be required. He will show his pass and identity card upon demand of any field officer, company commander, or member of the military police.

737. Uniform.—Every accredited correspondent and photographer will provide himself with, and while in the theater of operations will wear, the officers' field uniform without any insignia of rank or branch of service.

Correspondents will wear on the left arm a green brassard bearing the letter "C" in red. Accredited photographers will wear in the same manner a blue brassard bearing the letter "P" in white.

Messengers will wear the field uniform of an enlisted man without insignia of rank or branch of service. Their brassards, corresponding in colors to those prescribed for correspondents and photographers, will bear the letter "M."

738. Discipline.—No correspondent or photographer will leave the field forces to which he is attached, either to go home or for any other purpose, without the permission of the commander thereof. Their privileges may be temporarily suspended either for misconduct on their own part or for the distortion or misuse of their dispatches and pictures in the offices of their employers. When the commander of the field forces considers that the conduct of a correspondent or photographer justifies such action, he may expel him from the theater of operations, reporting the facts in the case to the War Department.

739. No officer, enlisted man, or civilian employee of the military forces serving in the theater of operations will be permitted to correspond for any publication without the approval of the Secretary of War.

CHAPTER V.

MILITARY POSTAL SERVICE.

(APPENDIX XVIII.)

740. Postal facilities for troops in the theater of operations are furnished by the military postal service, which is organized in time of war or emergency as a branch of the Adjutant General's Department.

The agencies of the military postal service for handling mail for troops in the theater of operations consist of stationary and mobile post offices and a railway mail service. Stationary post offices include base and area post offices and postal regulating stations. Mobile post offices comprise the postal detachments assigned permanently to divisions, corps, armies, groups of armies, and general headquarters.

741. Mail for troops in the theater of operations is collected at postal terminals in the zone of the interior where, after being sorted by organization, it is turned over by the Post Office Department to the theater of operations at the base post office or postal regulating station indicated.

Mail from troops in the theater of operations destined to the zone of the interior is collected by the mobile or area post offices for shipment to base post offices or postal regulating stations, where it is turned over to agencies of the Post Office Department for forwarding to destination.

742. The efficiency of the military postal service depends largely on the efficieney of company mail orderlies. They are the final link in the chain between the addressor and addressee. They should therefore be selected with much care. They keep up to date a roster of all members of their unit, past and present, together with the addresses of all who have left the organization. The maintenance of a complete list of addresses is essential to the prompt forwarding of mail to former members of the unit and those who for any cause are temporarily detached therefrom.

743. It is the duty of the officer commanding a company, battery, troop, hospital, or similar organization to see that every officer and enlisted man upon joining his organization promptly notifies the commanding officer of his last organization and his relatives and friends of his new address.

744. When necessary, a motor dispatch service is organized as part of the military postal service to supplement the railway mail service and to afford rapid and frequent communication between the headquarters of divisions and higher units.

A courier service is organized for service between the War Department and general headquarters and between the latter and important subordinate headquarters in the theater of operations.

APPENDIX I.

FORMS OF FIELD AND ADMINISTRATIVE ORDERS AND MARCH TABLE.

It is impossible to prescribe forms to fit every tactical situation. Those herein given cover the more common and general situations that arise, and furnish, with suitable modifications, the basis for the less common and less general situations that confront commanders. They are given only for convenience of reference and with a view to securing uniformity. The amount of detail or data to be incorporated in the order depends upon the size of the unit and the situation. The sequence shown in paragraph 3 is not obligatory, but is arranged by the commander according to his best judgment. In general, the forms are based on the division, but with such modifications as may be necessary are suitable for any unit.

AN ADVANCE.

FIELD ORDERS } Title.
No. — } Place.
Date and hour.

Maps:

1. Information relative to the enemy and friendly troops.
2. General plan of commander—generally to advance to or on a designated locality; mission, route.

Troops.[1]

(a) Cavalry:
Commander.[2]
Troops.

(b) Advance guard:
Commander.[2]
Troops.

(c) Main body—in order of march:
Commander.
Troops.

(d) Right (left) flank guard:
Commander.[2]
Troops.

3. (a) Instructions for cavalry—place and time of departure, roads or country to be covered, special missions.
   (b) Instructions for advance guard—place and time of departure or distance at which it is to precede main body, route, special missions.
   (c) Instructions for main body—place and time of departure or distance at which it is to follow advance guard.
   (d) Instructions for flank guard—place and time of departure, route, special missions.

[1] The "Distribution of Troops" may be placed either in paragraph 2, or on the left of the body of the order, occupying generally about one-third of the page, as shown in the succeeding form.

[2] If the advance or flank guard consists of but one specific tactical organization, the name of the commander may be omitted, unless special reasons exist for naming him.

(e) Instructions for air service—reconnaissance, contact, especially with cavalry, selection of landing fields and time of moving thereto.

(x) Instructions for outpost—when relieved, subsequent duties. Other instructions applicable to whole command.

4. If an administrative order is issued, refer to it by number. If one is not issued, give such instructions for trains, supply, and evacuation as are necessary in each case.

5. (a) Plan of signal communications: Refer to annex, if any, or indicate changes.

(b) Axis of signal communications: If necessary, otherwise omit.

(c) Command posts: Give successive locations and hours to be occupied if advance by bounds, otherwise location of commander in column or place to which messages are to be sent.

Signature.

Distribution:

AN ADVANCE IN MORE THAN ONE COLUMN.

FIELD ORDERS No. — } Title. Place. Date and hour.

Maps:

1. Information relative to the enemy and friendly troops.
2. General plan of commander—generally to advance on or to a designated place or locality; mission, zone of advance.

Troops.[1]

(a) Cavalry:
Commander.
Troops.

(b) Right column:[2]
Commander.
Troops.

(c) Left column:[2]
Commander.
Troops.

(d) Center column:[2]
Commander.
Troops.

3. (a) Instructions for cavalry—time and place of departure, roads or country to be covered, special missions, zone of advance (usually same as for unit, especially if used as a screen).

(b) Instructions for right column—time and place of departure, special missions, contact with adjoining units, security measures, route or routes within zone of advance (usually no restrictions), zone of advance.

(c) Instructions for left column—same as under (b).

(d) Instructions for center column—same as under (b).

If center column is used as reserve or follows in rear of other columns, usually all that is necessary is to prescribe route, time, and place of departure, or distance at which it is to follow. If superior commander retains command, give order of march.

---

[1] The column "Distribution of Troops" may be omitted and the composition of each column given in the appropriate subparagraphs of paragraph 3. The "Distribution of Troops" may be given in paragraph 2, as shown in preceding form.

[2] When the unit marches in more than one column, each column ordinarily is preceded by an advance guard, detailed by, and directly responsible to, the column commander.

(e) Instructions for air service—reconnaissance, contact, especially with cavalry, selection of landing fields and time of moving thereto.
(x) Instructions applicable to whole command. May include general instructions as to contact and security.

4. If an administrative order is issued, refer to it by number. If one is not issued, give such instructions for trains, supply, and evacuation as are necessary in each case.
5. (a) Plan of signal communications: Refer to annex, if any, or indicate changes.
(b) Axes of signal communications: Give axis of unit and axis of each column, unless route of each column has been definitely prescribed.
(c) Command posts: Give initial and subsequent command posts of unit and time of opening at each. If desired, command posts, and time of opening at each are prescribed for each column. They may be prescribed as "En route," but the location on the termination of the march should be designated when possible.

Signature.

Distribution:

ADVANCE GUARD.

FIELD ORDERS } Title.
No. — } Place.
Date and hour.

Maps:

1. Information relative to the enemy and friendly troops.
2. General plan of commander—generally a statement that the troops detailed form the advance guard for the larger designated command; destination or direction of march.

Troops.[1]

(a) Cavalry:
Commander.
Troops.
(b) Support:
Commander.
Troops.
(c) Reserve—in order of march:
Troops.

3. (a) Instructions for cavalry—place and time of departure, roads or country to be covered, special missions.
(b) Instructions for support—place and time of departure, route, reconnaissance, special missions.
(c) Instructions for reserve—distance at which it is to follow support, reconnaissance.
(x) General instruction relating to whole command.
4. Instructions for field and combat trains.
5. Place of commander or where messages are to be sent.

Signature.

Distribution:

A HALT FOR THE NIGHT—CAMP WITH OUTPOST.

FIELD ORDERS } Title.
No. — } Place.
Date and hour.

Maps:

1. Information relative to the enemy and friendly troops.

[1] In small commands this column can be omitted, the distribution being covered in the subparagraph of paragraph 3.

2. General plan of commander—to go into shelter, general location.
3. (a) Instructions for cavalry—reconnaissance, contact with enemy, special missions.
   (b) Designation of troops and commander [1] for outpost, general line to be held, special reconnaissance, connection with other outposts, if any.
   (c) Instructions for troops not detailed for outpost duty—location of shelter areas, designation of area commanders,[2] special security measures. In large commands, when shelter areas are assigned to groups, a separate lettered subparagraph may be assigned to each group, reciting its composition and containing the special instructions for the group.
   (d) Instructions for air service—location, reconnaissance, special missions.
   (x) General instructions applicable to whole command, such as conduct in case of attack, etc.
4. If administrative order is issued, refer to it by number. If one is not issued, give instructions as to trains and such other administrative, supply, and evacuation details as are necessary.
5. Command posts: Of unit, and if necessary, of principal subordinate units.

Signature.

Distribution:

OUTPOST.

FIELD ORDERS } Title.
No. — } Place.
Date and hour.

Maps:

1. Information relative to the enemy and friendly troops.
2. General plan of commander—to establish outpost, approximate line of resistance.

Troops.[3]

(a) Cavalry:
Commander.
Troops.

(b) Supports:[4] [5]
No. 1.
Commander.
Troops.
No. 2.
Commander.
Troops.
No. 3.
Commander.
Troops.

(c) Detached post:
Commander.
Troops.

(d) Reserve:
Commander.
Troops.

---

[1] When the advance guard is large, the order may direct the advance guard commander to establish the outpost.

[2] Omitted when the superior commander exercises immediate command of the camp.

[3] For small outposts, the "Distribution of Troops" may be omitted and elements covered in appropriate subparagraphs of paragraph 3.

[4] Numbered from right to left.

[5] If desired, each support can be given a separate letter, corresponding changes being made in paragraph 3.

3. (a) Instructions for cavalry—contact with enemy, roads or country to be especially watched, special missions.
   (b) Instructions for supports—position each is to occupy, sections of line of resistance each is to hold, reconnaissance, intrenching, etc.
   (c) Instructions for detached posts—position to be occupied, duties, amount of resistance, reconnaissance, etc.
   (d) Instructions for reserve—location, observation of flanks, etc.
   (e) Instructions for artillery—positions, barrage lines, protective fires, etc.
   (f) Instructions for machine guns, light mortars and 1-pounders (if not attached to supports or reserve)—positions, areas to be covered by fire, special duties.
   (x) Instructions applicable to whole command, such as conduct in case of attack, contact, etc.
4. Instructions for trains, rolling kitchens, location of aid stations.
5. Command posts: Of outpost and of such higher or lower units as may be necessary.

Signature.

Distribution:

ATTACK.

FIELD ORDERS } Title.
No. — } Place.
Date and hour.

Maps:

1. Information relative to the enemy and friendly troops.
2. General plan of commander—give mission or objective, scheme of maneuver (whether envelopment, penetration, etc.), zone of action and direction of attack, time of attack, line of departure (if entire command is launched from same line; if not, give line for each unit in appropriate subparagraph of paragraph 3).
3. (a) Instructions for infantry—(a separate lettered subparagraph being assigned to each infantry unit to which instructions are given)—give mission or objective, zone of action and direction of attack, time of attack (if different from that given in paragraph 2), line of departure (if not given in paragraph 2).
   (b) Instructions for artillery—assignments, general locations, missions or targets, general instructions as to forward displacement. If necessary, amplify by annex.
   (c) Instructions for cavalry—position, reconnaissance, special missions.
   (d) Instructions for air service—reconnaissance, combat, and special missions. If necessary, amplify by annex.
   (e) Instructions for tanks.
   (f) Instructions for reserve—composition, position, special missions.
   (g) Instructions for engineers—assignments, special missions. If assigned duties by administrative order, refer to that order.
   (h) Instructions for any troops not otherwise covered.
   (x) Instructions applicable to whole command.
4. If administrative order is issued, refer to it by number. If one is not issued, give such instructions regarding supply, evacuation, etc., as may be necessary.
5. (a) Plan of signal communication: Refer to annex, if any, or indicate changes.
   (b) Axes of signal communications: Give axis of unit and of next lower units.
   (c) Command posts: Give location of command post of unit, and when appropriate, of next lower units.

Signature.

Distribution:

DEFENSE.

FIELD ORDERS No. — } Title. Place. Date and hour.

Maps:

1. (a) Information relative to the enemy.[1]
   (b) Information relative to friendly troops.
2. (a) General plan of commander giving general line to be defended.
   (b) Positions to be organized—first, second, outpost, switch, giving, in general terms, main line and zone of resistance of each position.[2]
   (c) Boundaries of sector occupied by the command.
3. (a) Infantry: Assignment to sectors, special missions; use a subparagraph 3 (a), 3 (b) for each organization holding a sector and give boundaries thereof.
   (b) Artillery: Positions; assignment to missions of direct support, general employment, and antitank defense; instructions relative to time of opening fire.[3]
   (c) Reserves: Designation of units; commander; positions; degree of readiness; work to be done in organization of position.
   (d) Tanks: Assignment to reserve or to subordinate units; positions.
   (e) Cavalry: Position (to cover one or both flanks, or main force held in suitable position to act in crises of engagement); reconnaissance.
   (f) Air Service: Battle reconnaissance and observation, giving area within which observation is to be carried out; character of information specially desired; combat and special missions.[4]
   (g) Engineers: Units attached to infantry and artillery for organization of positions; special work in connection with defensive organization; for other details refer to administrative order.
   (h) Instructions for any troops not otherwise covered.
   (x) Instructions pertaining to whole command.

   Conduct of defense:
   (1) Mission of each position when there is more than one (use lettered paragraph for each position).
   (2) Manner of defending each position; strength to be employed.
   (3) Action in case of surprise attack and in case of foreseen attack.
   (4) Counterattack, when made, by what units, direction and extent.
   (5) Directions for coordination of infantry and artillery defensive measures (fire plan).
   (6) General instructions as to missions of machine guns; arrangements for coordination within organization and with adjacent organizations.[5]
   (7) Instructions for gas defense; gas alert and danger zones.
   (8) Special instructions for organization of the ground; priority of work.
4. Refer to administrative order by number.
5. (a) Plan of signal communications: Refer to annex, if any, or indicate changes.
   (b) Axes of signal communications: Of unit and next lower units.
   (c) Command posts: Of unit and next lower unit.

Signature.

Distribution:

When time permits, and the situation requires, the various paragraphs of the field order are supplemented by annexes as shown below, which contain details.

[1] Annex No. ——, Intelligence (or refer to Summary of Intelligence, Enemy Situation Map, etc.).
[2] Annex No. ——, Organization of the Ground.
[3] Annex No. ——, Artillery.
[4] Annex No. ——, Air Service.
[5] Annex No. ——, Machine Guns (generally in form of map or machine gun fires).

POSITION IN READINESS.

FIELD ORDERS } Title.
No. — } Place.
Date and hour.

Maps:

1. Information relative to the enemy and friendly troops.
2. General plan of commander—to take up a position in readiness at or near ———. Purpose should normally be given.
3. (a) Instructions for infantry—positions or places of assembly, points to be especially held, reconnaissance.
   (b) Instructions for artillery—positions or places of assembly, orders for necessary reconnaissance and methods of support.
   (c) Instructions for cavalry—reconnaissance, special missions.
   (d) Instructions for covering forces—line or position to be occupied, reconnaissance, special duties.[1]
   (e) Instructions for air service—reconnaissance, special missions.
   (f) Instructions for engineers—positions or places of assembly, special work.
   (g) Instructions for tanks—positions or places of assembly.
   (x) Any instructions applicable to whole command.
4. If administrative order is issued, refer to it by number. If one is not issued give instructions to field and service trains—generally to assemble in designated areas; any other administrative and supply instructions deemed necessary.
5. Command posts: Of unit and of next lower units.

Signature.

Distribution:

RETREAT.

FIELD ORDERS } Title.
No — } Place.
Date and hour.

Maps:

1. Information relative to the enemy and friendly troops.
2. General plan of commander—to retire to or in direction of———.

Troops.

(a) Leading troops: [2]
Commander.
Troops.
(b) Main body—in order of march: [3]
Troops.
(c) Rear guard: [4]
Commander.
Troops.
(d) Right (left) flank guard:
Commander.
Troops.

---

[1] If these instructions are general, and do not relate to a specific tactical unit, they may be placed in subparagraph (x).

[2] If the retreat is made in more than one column this heading is omitted, each column commander attending to this detail.

[3] If the retreat is made in more than one column this heading is omitted, each column, with the troops composing it, being listed instead. The subparagraphs in paragraph 3 are changed to correspond.

[4] When the retreat is made in more than one column, each column commander designates the rear guard for his column.

3. (a) Instructions for leading troops—place and time of departure, route, special missions.
   (b) Instructions for main body—place and time of departure, route.
   (c) Instructions for rear guard—distance from main body or place and time of departure, successive positions, special missions.
   (d) Instructions for flank guard—place and time of departure, route, special missions.
   (e) Instructions for air service—reconnaissance, combat, and special missions.
   (x) Instructions for outposts—when relieved, subsequent duties (usually forming the rear guard). Other instructions applicable to whole command, such as demolitions, etc.
4. If administrative order is issued, refer to it by number. If one is not issued, give such instructions regarding supply, evacuation, etc., as may be necessary.
5. (a) Plan of signal communications.
   (b) Axis of signal communications: That of unit if necessary.
   (c) Command posts: Initial locations or places to which messages may be sent. If subsequent locations are known, indicate place and time of opening at each.

Signature.

Distribution:

REAR GUARD.

FIELD ORDERS } Title.
No. — } Place.
Date and hour.

Maps:

1. Information relative to the enemy and friendly troops.
2. General plan of commander—mission of rear guard.

Troops.

(a) Reserve—in order of march:
Troops.
(b) Support:
Commander.
Troops.
(c) Cavalry:
Commander.
Troops.

3. (a) Instructions for reserve—place and time of departure, or approximate distance from main body, reconnaissance, special missions.
   (b) Instructions for support—place and time of departure, or distance from reserve, any special reconnaissance.
   (c) Instructions for cavalry—place and time of departure, roads or country to be covered, special missions, demolitions.
4. Such administrative details as affect the troops of the rear guard only—usually instructions for the trains of the rear guard to join train of main body.
5. (a) Axis of signal communications: Of main body if prescribed.
   (b) Command post: Initial location, or place to which messages may be sent.

Signature.

Distribution:

ADMINISTRATIVE ORDER.

In using the following form, the details to be included depend entirely upon the situation, and upon the state of training and experience of the unit. Only such paragraphs as apply to the situation are embodied in the order.

ADMINISTRATIVE ORDERS } Title.
No. — } Place.
Date and hour.

To accompany Field Orders No. —.

Maps:

1. SUPPLY.
   - *a. Railhead.*—(Give location and date of drawing supplies therefrom.)
   - *b. Class I supplies* (and any other designated supplies).
     - (1) Distributing point or points. (Organizations to be served at each, with time.)
     - (2) Special instructions when necessary.
     - (3) Refer to Annex No. —, Quartermaster Plan, when issued.
   - *c. Ammunition.*
     - (1) Refilling point or points.
     - (2) Distributing point or points. (Organizations served at each.)
     - (3) Refer to Annex No. —, Ammunition Plan, when issued.
   - *d. Water.*
     - (1) Location of distributing points (with organizations served at each) or method of supply.
     - (2) Special instructions or caution relative to condition of water, keeping water vehicles filled, chlorination.
   - *e. Engineer.*
     - (1) Refilling point or points and description of material (organizations to be served at each).
     - (2) Distributing point or points, when needed.
     - (3) Special instructions to tool wagons, when necessary.

NOTE.—Similar subparagraphs pertaining to other supplies, such as ordnance, signal corps, medical, quartermaster, and air service, are added when necessary.

2. EVACUATION.
   - *a. Casualties.*
     - (1) Men.
       - (*a*) Collecting station or stations.
       - (*b*) Hospital station or stations.
     - (2) Animals.
       - (*a*) Collecting station or stations.
       - (*b*) Special instructions of interest to the command.
     - (3) Refer to Annex No. —, Medical Plan, when issued.
   - *b. Burial.*—Instructions as to cemeteries and burials.
   - *c. Salvage.*—(Collection and evacuation.)
   - *d. Captured material.*—(Disposition and reports.)
   - *e. Prisoners of war.*—Collecting points, cages, and inclosures, disposition.
3. TRAFFIC.
   - *a. Circulation.*
     - (1) Refer to Annex No. —, Circulation Map, when issued.
     - (2) Restrictions.—(Assignment and use of reserved roads, limits as to time, daylight traffic and special routes for ammunition and ambulances.)

(3) Control.
(*a*) Instruction to provost marshal relative to police arrangements on roads.
(*b*) Schedule of traffic priority including barrier line.
(*c*) Disabled vehicles (disposition of).
(*d*) Distance between vehicles or groups of vehicles or men.

NOTE.—Other pertinent paragraphs may be added.

b. Construction and maintenance of routes.
(1) Roads and bridges.
(2) Direction signs. (Any instructions other than routine.)
(3) Refer to Annex No. —, Engineer Plan (other than tactical), when issued.

c. Rear boundary.—When required.

4. TRAINS.
a. Service.
(1) Special instructions as to location and movement.
(2) Special assignment or release.
b. Field.
(1) Instructions relative to location, formation in column, or other movements.
(2) Location of bivouacs, when required.
c. Combat.—(When separated from organizations for traffic control.)
d. Instructions relative to liaison or other matters not covered in *a* and *b*.

5. PERSONNEL.
a. Stragglers.—(Location of straggler line and collecting points.)
b. Surplus baggage.—(Disposition, usually refers to packs and equipment, or division orders.)
c. Mail.
d. Shelter.—Instructions for quartering parties.
e. Rear echelon of headquarters.—Location of, when required.

6. MISCELLANEOUS.
Any administrative matters not otherwise covered.

By command of Major General ——— ———,

Official:

——— ———

Assistant Chief of Staff, G-4. *Chief of Staff.*

Appendices:
Distribution:

MARCH TABLE.

Serial No.	Organizations and commanders.	Destination.	Route.	Remarks.
For convenience of reference the separate columns or detachments are numbered serially: 1, 2, 3, etc.	Insert name of commander of each column and list organizations composing it.	Destination of the column. Where organizations of the column have different destinations, insert destination of each.	Route to be followed.	Any instructions as to hours of departure, clearance of initial or other designated points, dispositions en route or at destination, supply, etc.

1. If the table covers a march of several days, the date will appear at the head of the section of the table for each day's march, or a column headed "Date" can be inserted between "Serial No." and "Organizations and commanders" and the respective dates placed opposite each serial number.

2. If move is made by truck and marching, an additional column should be inserted between "Route" and "Remarks" headed "How made" and methods specified. When move is made by truck, column of "Remarks" should show entrucking and detrucking points.

3. Where the march table accompanies a field order, reference is made to the letter, e. g. To accompany FO No. 5, 1st Div.

APPENDIX II.

LIST OF ABBREVIATIONS.

Adjutant	Adj
Advance	Adv
Airdrome	Adrm
Air Park	A Prk
Airship	Ash
Ambulance	Amb
American Expeditionary Forces	AEF
Ammunition	Am
Animal or Animal-drawn	Anl
Antiaircraft	A A
Antiaircraft Artillery	A AA
Assistant Chief of Staff	AC of S
Attack (Wing) (Group) (Squadron)	Atk (Wg) (Gp) (Sq)
Axis or Axes of Signal Communications	Ax Sig Com
Balloon	Bln
Battalion	Bn
Battery	Btry
Bridge Train (Heavy) (Light)	Bdg Tn (Hv) (L)
Brigade	Brig
Brigadier General	Brig Gen
Camouflage	Cam
Captain	Capt
Cavalry	Cav
Chemical	Cml
Chief of Staff	C of S
Colonel	Col
Collecting Point	Coll P
Collecting Station	Coll Sta
Combat Train	C Tn
Combat Zone	CZ
Commander	Comdr
Command Post	CP
Commanding General	CG
Commanding Officer	CO
Communications	Com
Communications Zone	Com Z
Company	Co
Convalescent (Hospital)	Conv (Hosp)
Crossroads	CR
Day Bombardment Group	Day Bomb Gp
Depot	Dep
Deputy Chief of Staff	DC of S
Detachment	Det
Distributing Point	DP
Engineers	Engrs
Evacuation (Hospital)	Evac (Hosp)

Executive (Officer)	Ex (O)
Exclusive	Excl
Field Artillery	FA
Field Orders	FO
Field Train	F Tn
First Lieutenant	1st Lt
General	Gen
General Headquarters	GHQ
General Staff (Corps)	GS (C)
Geological Survey	Geol Surv
Group or Grouping	Gp
Headquarters	Hq
Heavy	Hv
Hospital	Hosp
Howitzer	How
Inclusive	Incl
Infantry	Inf
Intelligence	Int
Liaison Officer	Ln O
Lieutenant	Lt
Machine Gun	MG
Machine Rifle	MR
Maintenance Section	Maint Sec
Major	Maj
Message Center	Msg Cen
Meteorological	Met
Military Police	MP
Motor Car Company	MC Co
Motorcycle Company	Mtcl Co
Motor Dispatch Service	MDS
Motorized	Mtz
Motor Repair	M Rep
Motor Transport	MT
Motor Truck	M Trk
Mounted	Mtd
Noncommissioned Officer	NCO
Observation	Obsn
Observation Post	OP
Officer	O
One-pounder (section)	1-pdr (sec)
Ordnance	Ord
Organization	Orgn
Pack	Pk
Park	Prk
Photo Section	Photo Sec
Pigeon	Pig
Pioneer and Demolition Section	P & D Sec
Platoon	Plat
Ponton	Pon
Postal Section	Post Sec
Provost Marshal	PM
Pursuit	Pur
Quartermaster	QM
Ration Distributing Point	RDP

Radio	Rad
Railhead	Rhd
Railroad Transportation Officer	RTO
Railway	Ry
Refilling Point	RP
Regiment (Regimental)	Regt (Regtl)
Regulating Officer	RO
Regulating Station	RS
Sanitary	Sn
Second Lieutenant	2d Lt
Section	Sec
Service	Serv
Signal	Sig
Small Arms Ammunition	SA Am
Sound Ranging	SR
Squad	Sqd
Squadron	Sq
Station	Sta
Supply	Sup
Surgeon	Surg
Tank	Tk
Telephone & Telegraph Section	Tel Sec
Theater of Operations	T of Opns
Topographical Battalion	Top Bn
Train	Tn
Trench Mortar	TM
Verbal Orders	VO
Veterinary	Vet
Wagon	Wag
Yard (s)	Yd (s)
Zone of the Interior	Z of I

Abbreviations Used Within an Infantry Division.

Note.—The abbreviation 1st Div or 1st Brig implies an Infantry Division or Infantry Brigade. Cavalry Divisions or Brigades and Field Artillery Brigades are designated by including the abbreviations Cav or FA, as 1st Cav Div, 1st FA Brig.

1st Infantry Division	1st Div
1st Infantry Brigade	1st Brig
Special Troops, 1st Division	Sp Trs 1st Div
Headquarters Company, 1st Division	Hq Co 1st Div
Forward Echelon, Headquarters 1st Division	Fwd Ech Hq 1st Div
Forward Echelon, Headquarters Company, 1st Division	Fwd Ech Hq Co 1st Div
Rear Echelon, Headquarters 1st Division	Rr Ech Hq 1st Div
Rear Echelon, Headquarters Company, 1st Division	Rr Ech Hq Co 1st Div
Signal Company, 1st Division	1st Sig Co
Light Tank Company, 1st Division	1st Tk Co
Ordnance Company (Maintenance), 1st Division	1st Ord Co
Service Company, 1st Division	Serv Co 1st Div
Military Police Company, 1st Division	1st MP Co
Headquarters Company, 1st Brigade	Hq Co 1st Brig
Headquarters and Headquarters Company, 1st Brigade	Hq & Hq Co 1st Brig
1st Infantry	1st Inf
Headquarters Company, 1st Infantry	Hq Co 1st Inf
Headquarters and Headquarters Company, 1st Infantry	Hq & Hq Co 1st Inf

Intelligence Platoon, Headquarters Company, 1st Infantry---- Int Plat 1st Inf
Pioneer Platoon, Headquarters Company, 1st Infantry------ Pion Plat 1st Inf
Communication Platoon, Headquarters Company, 1st Infantry- Com Plat 1st Inf
Service Company, 1st Infantry---------- Serv Co 1st Inf
Headquarters Platoon, Service Company, 1st Infantry- Hq Plat Serv Co 1st Inf
Transportation Platoon, Service Company, 1st Infantry-------- T Plat 1st Inf
1st Battalion, 1st Infantry---------- 1st Bn 1st Inf
one battalion 1st Infantry---------- 1 bn 1st Inf
Headquarters and Headquarters Company, 1st Battalion, 1st Infantry.
Hq & Hq Co 1st Bn 1st Inf
one machine gun company, 1st Infantry---------- 1 MG co 1st Inf
Machine Gun Company, 1st Battalion, 1st Infantry---------- Co D 1st Inf
Machine Gun Company, 2d Battalion, 1st Infantry---------- Co H 1st Inf
Machine Gun Company, 3d Battalion, 1st Infantry---------- Co M 1st Inf
1st Platoon, Machine Gun Company, 1st Battalion, 1st Infantry.
1st Plat Co D 1st Inf
one machine gun platoon, 1st Infantry---------- 1 MG plat 1st Inf
one machine gun section, 1st Infantry---------- 1 MG sec 1st Inf
Company A, 1st Infantry---------- Co A 1st Inf
one rifle company, 1st Infantry---------- 1 co 1st Inf
one platoon, Company A, 1st Infantry---------- 1 plat Co A 1st Inf
one section, Company A, 1st Infantry---------- 1 sec Co A 1st Inf
one squad, Company A, 1st Infantry---------- 1 sqd Co A 1st Inf
Howitzer Company, 1st Infantry---------- How Co 1st Inf
one platoon, Howitzer Company, 1st Infantry---------- 1 plat How Co 1st Inf
one one-pounder section, Howitzer Company, 1st Infantry-- 1 1-pdr sec 1st Inf
one light mortar section, Howitzer Company, 1st Infantry---- 1 LM sec 1st Inf
Field Artillery Brigade, 1st Division---------- 1st FA Brig
1st Field Artillery---------- 1st FA
1st Battalion, 1st Field Artillery---------- 1st Bn 1st FA
one battalion, 1st Field Artillery---------- 1 bn 1st FA
Combat Train, 1st Battalion, 1st Field Artillery---------- C Tn 1st Bn 1st FA
Battery A, 1st Field Artillery---------- Btry A 1st FA
Ammunition Train, 1st Field Artillery Brigade---------- Am Tn 1st FA Brig
Transport Battery, Ammunition Train, 1st Field Artillery Brigade.
T Btry Am Tn 1st FA Brig
Ammunition Battery, Ammunition Train, 1st Field Artillery Brigade.
Am Btry Am Tn 1st FA Brig
155-mm. Howitzer Regiment, Corps Artillery-------- 101st FA (155mm How)
Air Service, 1st Division---------- AS 1st Div
Observation Squadron, 1st Division Air Service---------- 1st Obsn Sq
Photo Section, 1st Division Air Service---------- 1st Photo Sec
Air Intelligence Section, Air Service, 1st Division---------- 1st AIS
Combat Engineer Regiment, 1st Division---------- 1st Engrs
1st Battalion, 1st Engineers---------- 1st Bn 1st Engrs
Company A, 1st Engineers---------- Co A 1st Engrs
Transport Platoon, Headquarters and Service Company, 1st Engineers.
T Plat 1st Engrs
Mounted Platoon, Headquarters and Service Company, 1st Engineers.
Mtd Plat 1st Engrs
Medical Regiment, 1st Division---------- 1st Med Regt
Service Company, 1st Medical Regiment---------- Serv Co 1st Med Regt
Sanitary Battalion, 1st Medical Regiment---------- Sn Bn 1st Med Regt

Sanitary Companies, 1st Medical Regiment.. Sn Co No 1 (No 2) 1st Med Regt
Ambulance Battalion, 1st Medical Regiment..... Amb Bn 1st Med Regt
Ambulance Companies, Ambulance Battalion, 1st Medical Regiment.
Amb Co No 1 (No 2) (No 3) 1st Med Regt
Hospital Battalion, 1st Medical Regiment..... Hosp Bn 1st Med Regt
Hospital Companies, Hospital Battalion, 1st Medical Regiment.
Hosp Co No 1 (No 2) 1st Med Regt
Medical Supply Section, 1st Medical Regiment.... Med Sup Sec 1st Med Regt
Medical Laboratory Section, 1st Medical Regiment.. Med Lab Sec 1st Med Regt
Veterinary Company, 1st Medical Regiment..... Vet Co 1st Med Regt
Division Supply Column, 1st Division..... 1st Div Sup Coln
Motor Transport Companies, 1st Division Supply Column.
MT Co No 1 (No 2) (No 3) (No 4)
Motor Repair Sections, 1st Division Supply Column...M Rep Sec No 1 (No 2)
Motorcycle Company, 1st Division Supply Column..... Mtcl Co No 1
Wagon Companies, 1st Division Supply Column..... Wag Co No 1 (No 2)
one section Wagon Company..... 1 sec Wag Co

ABBREVIATIONS USED WITHIN A CAVALRY DIVISION.

1st Cavalry Division..... 1st Cav Div
1st Cavalry Brigade..... 1st Cav Brig
Headquarters and Headquarters Troop, 1st Cavalry Brigade.
Hq & Hq Tr 1st Cav Brig
Special Troops, 1st Cavalry Division..... Sp Tr 1st Cav Div
Headquarters Troop, 1st Cavalry Division..... Hq Tr 1st Cav Div
Signal Troop, 1st Cavalry Division..... 1st Sig Tr
Ordnance Company (Maintenance), 1st Cavalry Division.... 1st Ord Co (Cav)
Veterinary Company, 1st Cavalry Division..... Vet Co No 1
Forward Echelon, Headquarters Troop, 1st Cavalry Division.
Fwd Ech Hq Tr 1st Cav Div
Rear Echelon, Headquarters Troop, 1st Cavalry Division.
Rr Ech Hq Tr 1st Cav Div
1st Cavalry..... 1st Cav
1st Squadron, 1st Cavalry..... 1st Sq 1st Cav
Troop A, 1st Cavalry..... Tr A 1st Cav
1st Machine Gun Squadron..... 1st MG Sq
Troop A, 1st Machine Gun Squadron..... Tr A 1st MG Sq
Separate Battalion Horse Artillery, 1st Cavalry Division.... 1st FA Bn (horse)
Battalion Combat Train, 1st Field Artillery Battalion (horse).
Bn C Tn 1st FA Bn (horse)
Combat Engineer Battalion (mounted), 1st Cavalry Division.
1st Engr Bn (mtd)
Ambulance Company, 1st Cavalry Division..... Amb Co No 1 (Cav)
Division Supply Column, 1st Cavalry Division..... 1st Cav Div Sup Coln
Wagon Companies, 1st Cavalry Division Supply Column.. Wag Co No 1 (No 2)
Pack Trains, 1st Cavalry Division Supply Column.
P Tn No 1 (No 2) (No 3) (No 4)

FRACTIONAL ABBREVIATIONS.

1st Div (less 1 brig).
1st Cav Div (less 2d Brig).
2d FA Brig (less 4th FA and Am Tn).
3d Brig (less 1 regt).
2d Engrs (less Cos A and B).
2d Med Regt (less Amb Co No 1).
Sp Trs 1st Div (less Serv Co).

APPENDIX III.

Extract from the treaty concluded at Washington, February 6, 1922, between the United States of America, the British Empire, France, Italy, and Japan, respecting the use of submarines and noxious gases.

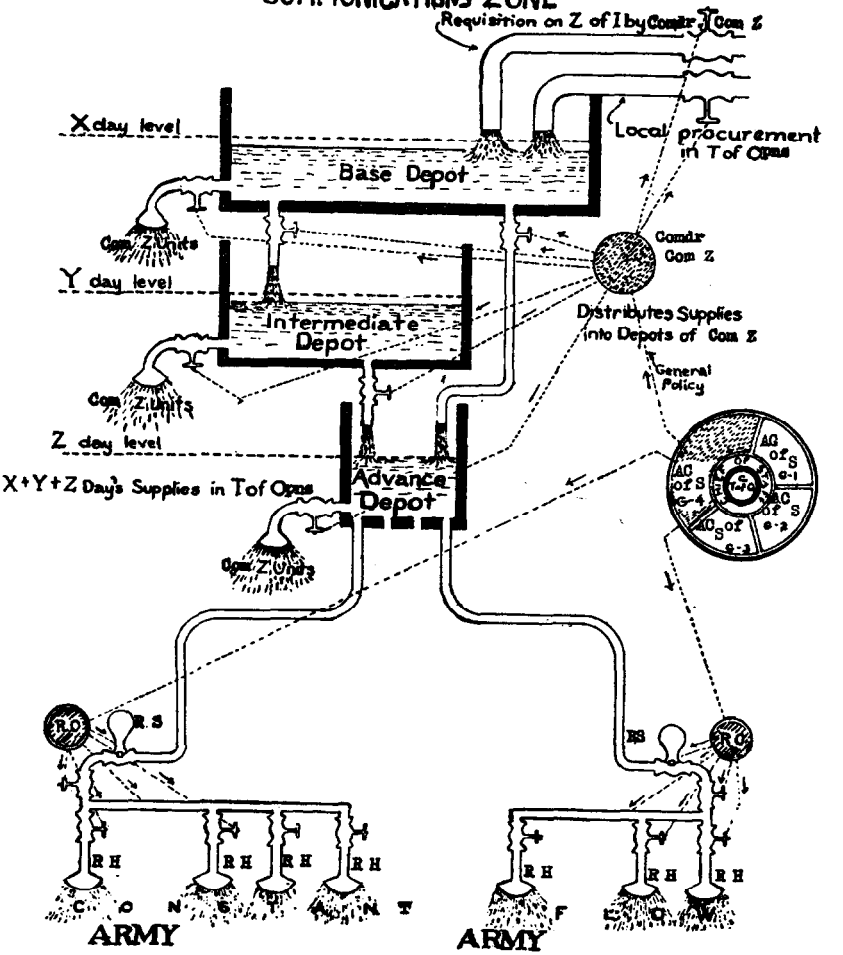
ARTICLE V.

"The use in war of asphyxiating, poisonous or other gases, and all analogous liquids, materials or devices, having been justly condemned by the general opinion of the civilized world and a prohibition of such use having been declared in treaties to which a majority of the civilized Powers are parties,

"The Signatory Powers, to the end that this prohibition shall be universally accepted as a part of international law, binding alike the conscience and practice of nations, declare their assent to such prohibition, agree to be bound thereby as between themselves and invite all other civilized nations to adhere thereto."

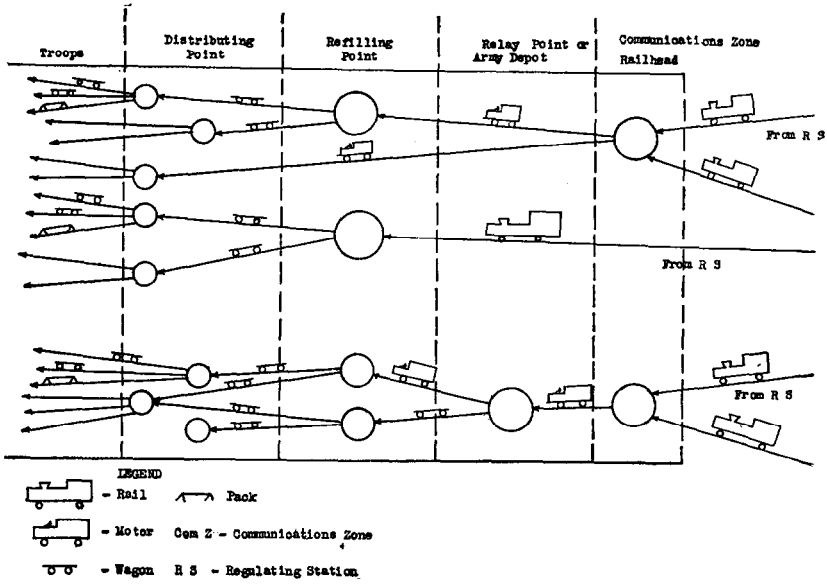
APPENDIX IV.

DIAGRAMMATIC REPRESENTATION OF THE FLOW OF SUPPLIES IN THE COMMUNICATIONS ZONE



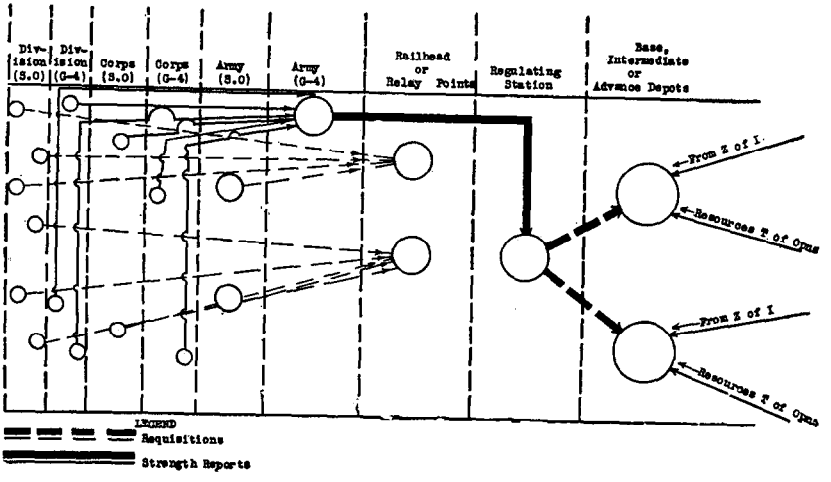
APPENDIX V.

Diagrammatic representation of forward movement of supply in the army.



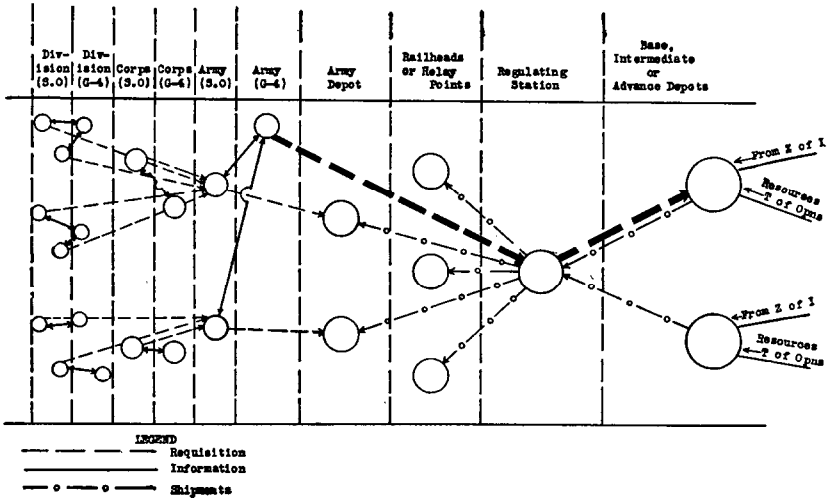
APPENDIX VI.

Diagrammatic representation of method of issue of Class I supplies. (For forward movement in army see Appendix V. For forward movement in communications zone see Appendix IV.)



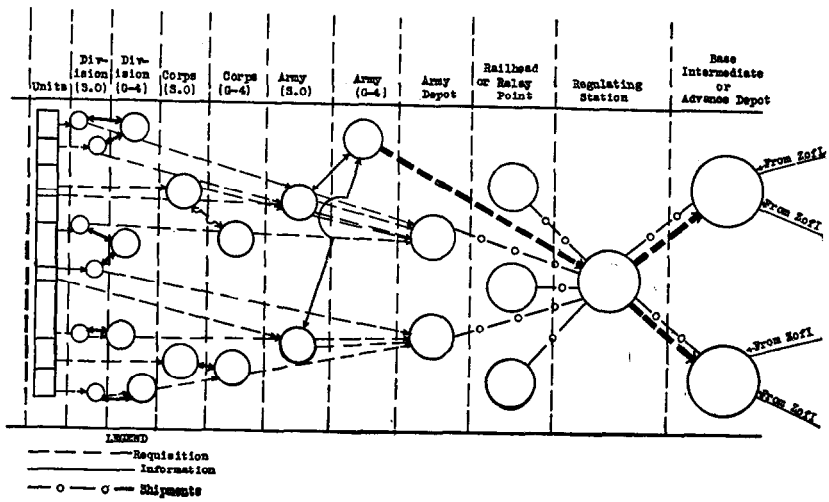
APPENDIX VII.

Diagrammatic representation of method of issue of Class II supplies. (For forward movement in army from railhead or army depot see Appendix V. For forward movement in communications zone see Appendix IV.)



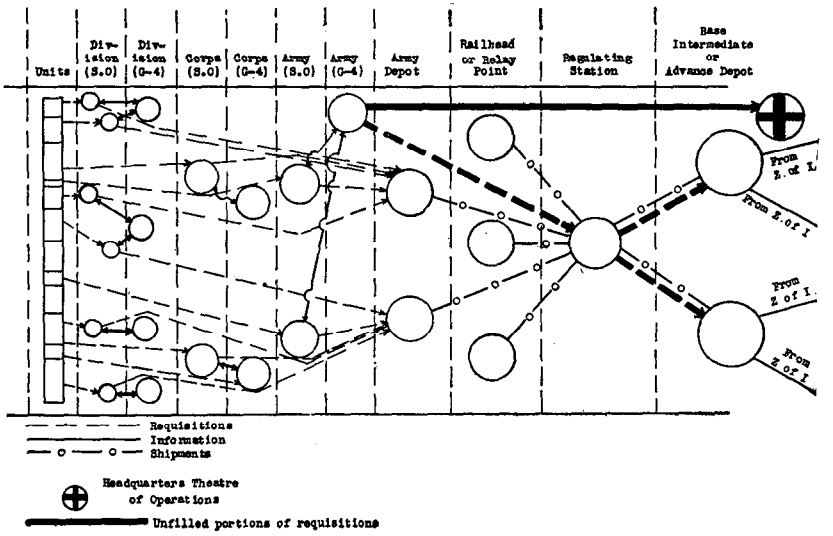
APPENDIX VIII.

Diagrammatic representation of method of issue of Class III supplies. (For forward movement in army see Appendix V. For forward movement in communications zone see Appendix IV.)



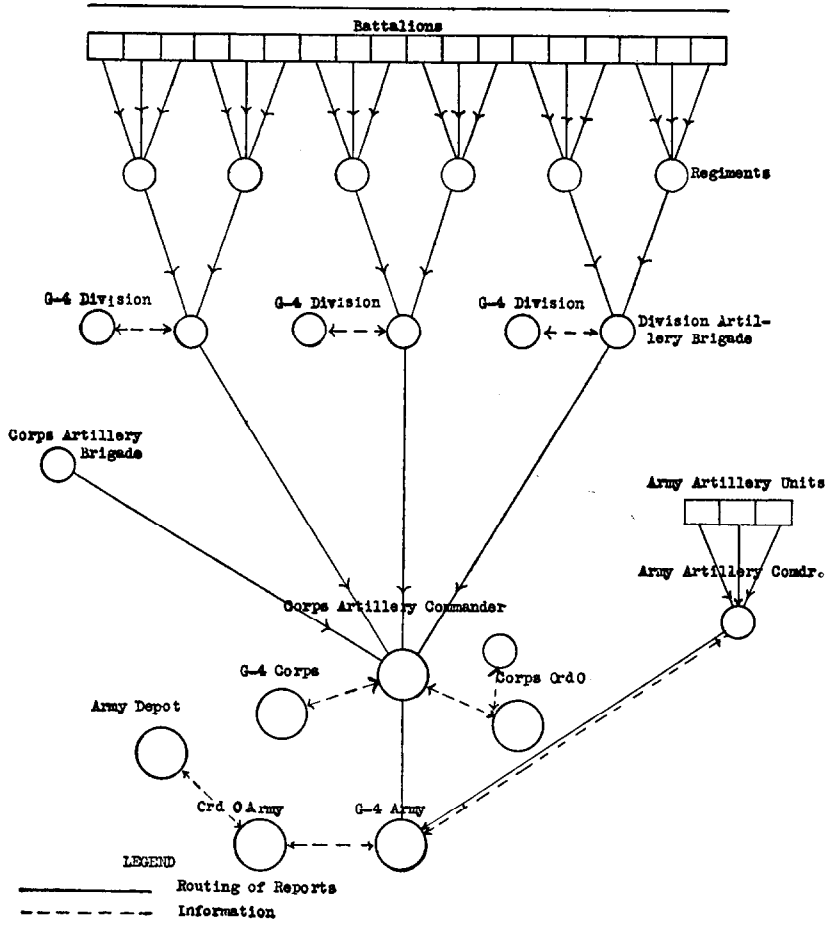
APPENDIX IX.

Diagrammatic representation of methods of issue of Class IV supplies. (For forward movement in army see Appendix V. For forward movement in communications zone see Appendix IV.)



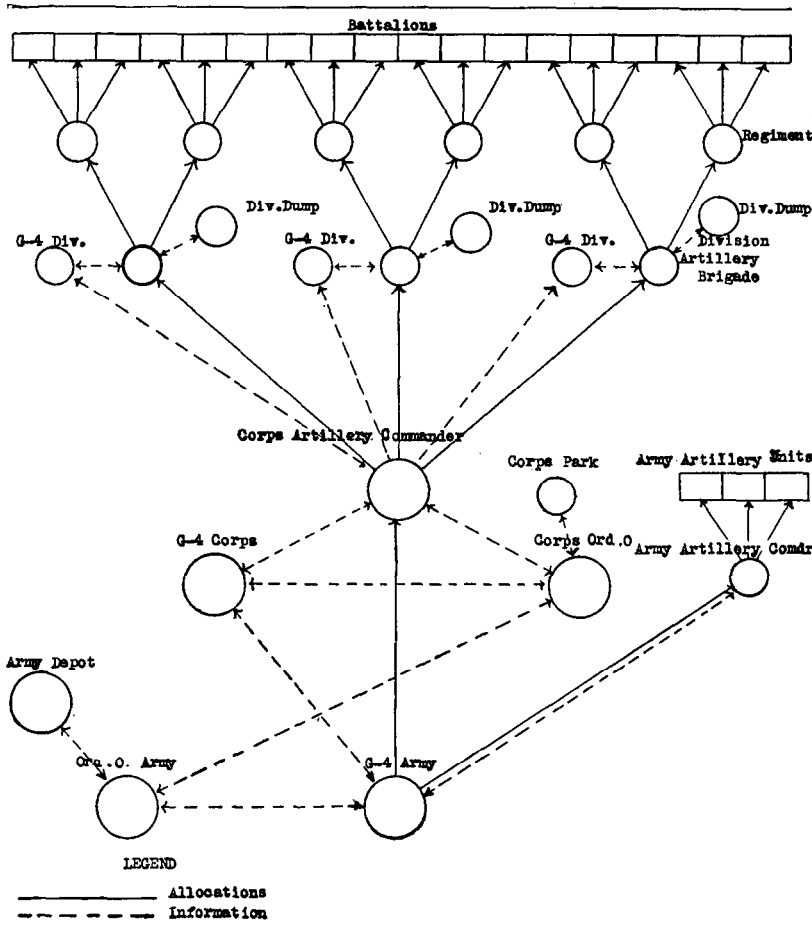
APPENDIX X.

Diagrammatic representation of expenditure reports of artillery ammunition.



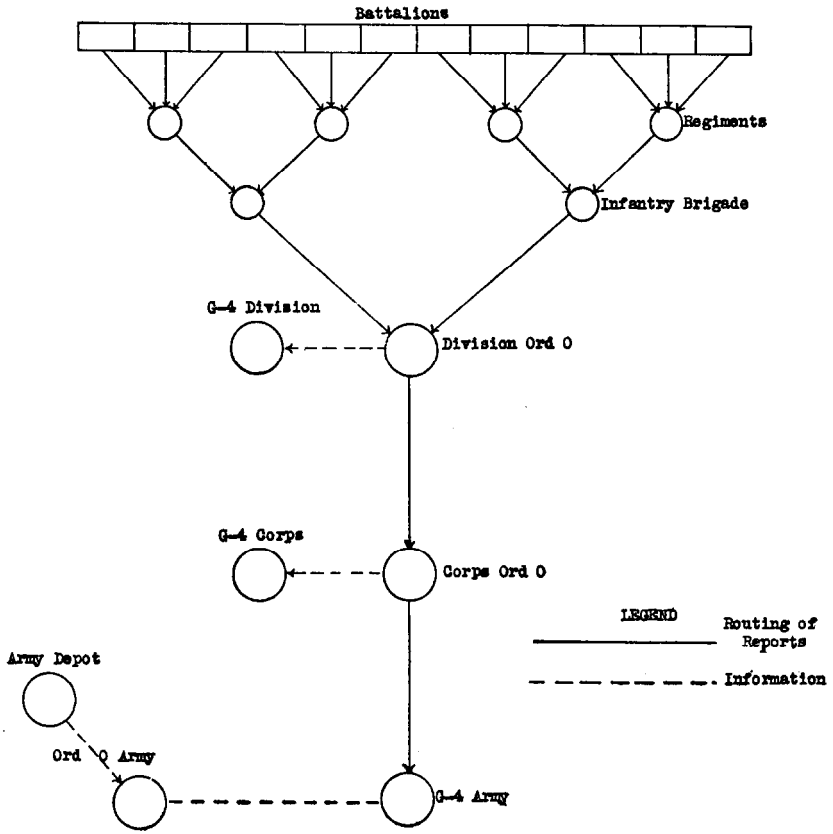
APPENDIX XI.

Diagrammatic representation of artillery ammunition allocations. (For forward movement in army see Appendix V.)



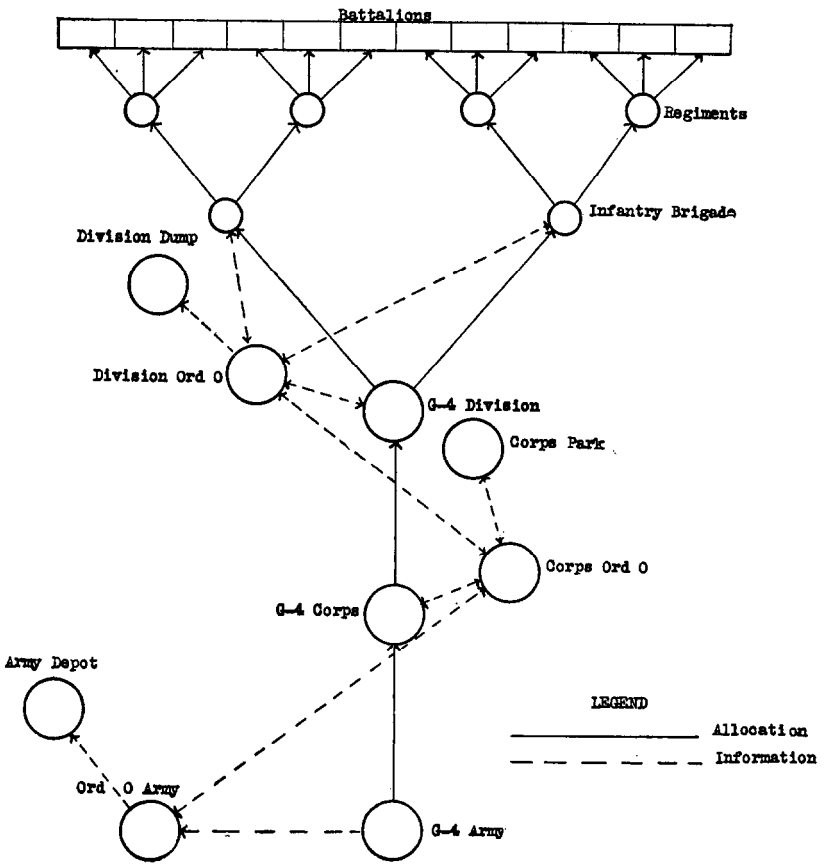
APPENDIX XII.

Diagrammatic representation of expenditure reports of infantry ammunition



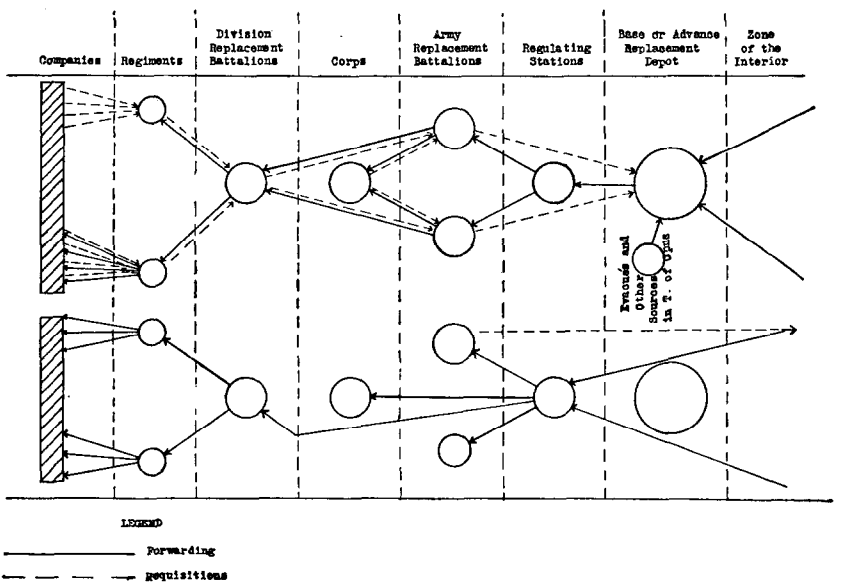
APPENDIX XIII.

Diagrammatic representation of infantry ammunition allocations. (For forward movement in army see Appendix V.)



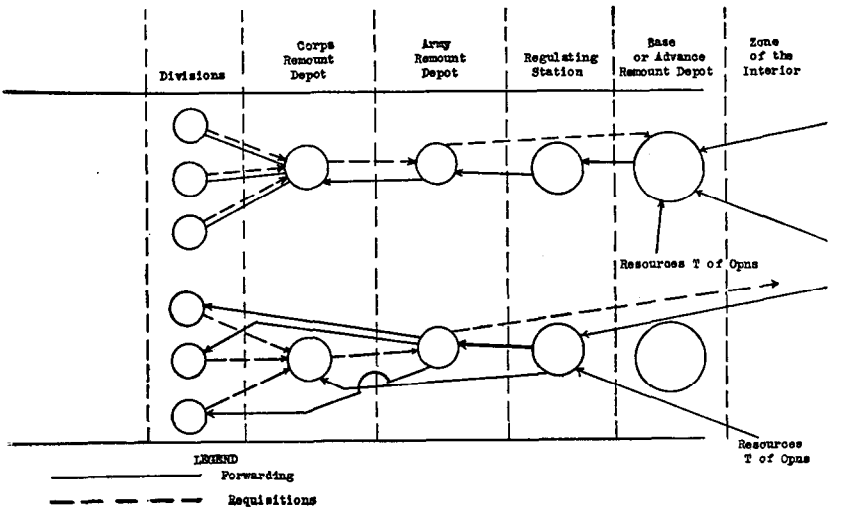
APPENDIX XIV.

Diagrammatic representation of requisitioning and forwarding of personnel replacements.



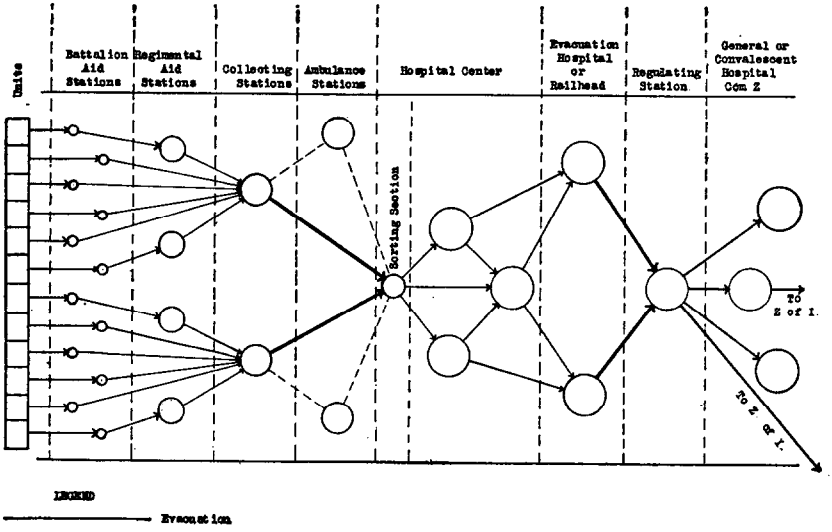
APPENDIX XV.

Diagrammatic representation of requisitioning and forwarding animal replacements.



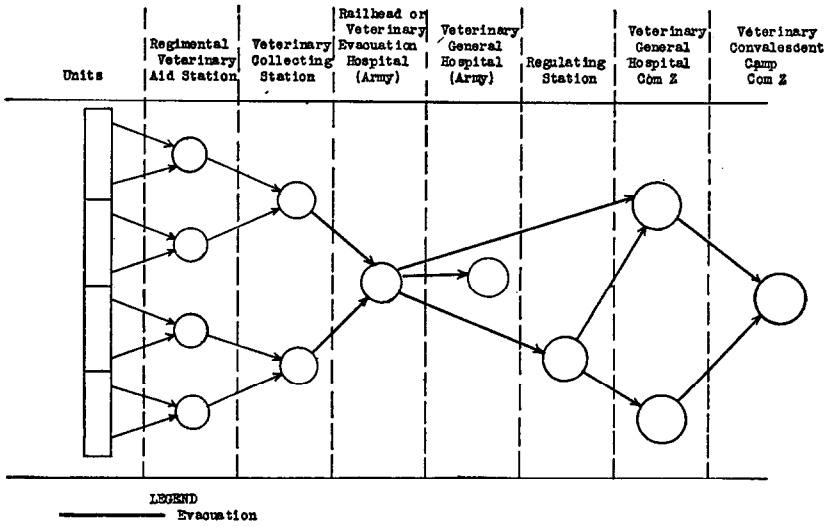
APPENDIX XVI.

Diagrammatic representation and method of hospitalization and evacuation of personnel.



APPENDIX XVII.

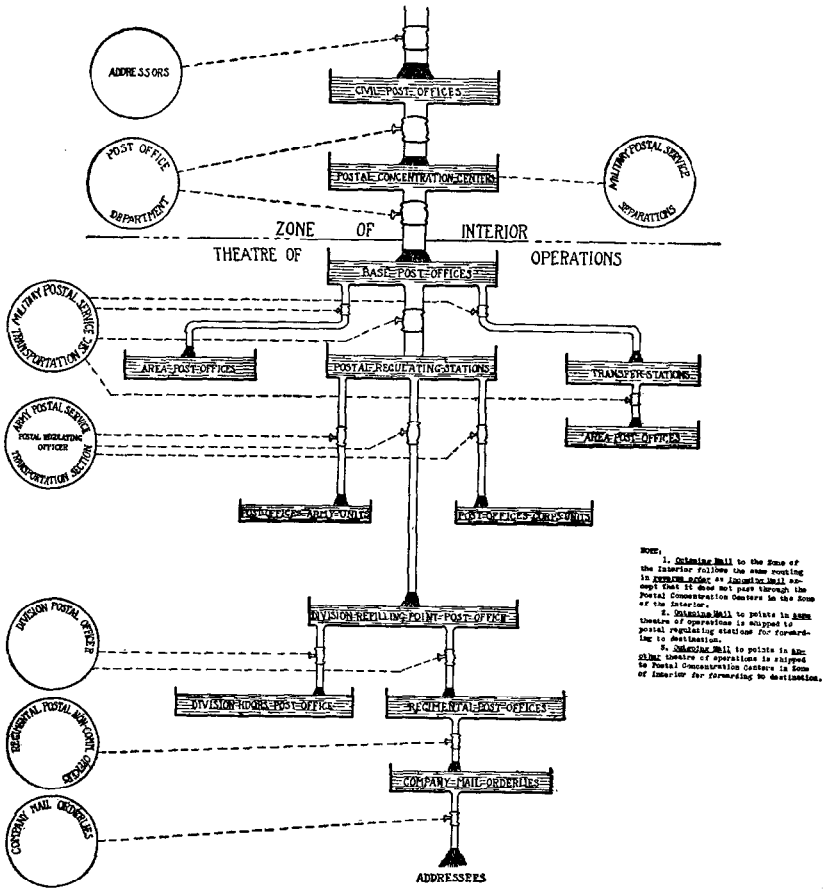
Diagrammatic representation of method of hospitalization and evacuation of animals.



APPENDIX XVIII.

DIAGRAMMATIC REPRESENTATION
OF THE FLOW OF
INCOMING MAIL

FROM THE ZONE OF THE INTERIOR TO THE THEATRE OF OPERATIONS BY ORDINARY MAIL ROUTES



NOTE:

1. Outgoing Mail to the Zone of the Interior follows the same routing in reverse order as incoming Mail except that it does not pass through the Postal Concentration Centers in the Zone of the Interior.

2. Outgoing Mail to points in Army theatre of operations is shipped to postal regulating stations for forwarding to destination.

3. Outgoing Mail to points in Army other theatre of operations is shipped to Postal Concentration Centers in Zone of Interior for forwarding to destination.

INDEX.

	Paragraph.
Administration	581–744
Administrative order	36
Advanced centers of information	156, 391
Advance guard:	
General	214–233
In attack of fortified position	465
In meeting engagement	442, 443, 454
Advance party	222, 224–229
Advance section, communications zone	591
Aerial bombardment	111, 493, 544, 559, 580
Aerial photography	169, 463, 467, 469, 541
Aerial reconnaissance:	
General	164–174
In attack of fortified position	463
In meeting engagement	459
Aid stations	687, 688, 711
Airplanes:	
Means of communication	109, 137
Use of flares	170, 321
Air service:	
Characteristics and missions	104–115
Counter reconnaissance	174
Employment by armies	389
Employment in pursuit	493, 495
Employment in attack on stabilized front	489
Reconnaissance	164–173
Airships	105, 115
Air transport	606
Ambulances: With advance guard	216
Ambulance stations	691
Ammunition supply	497, 527, 655–658
Animal transportation	635, 636, 642, 643
Annexes	37
Antiaircraft artillery:	
General missions	78
Distribution in marches	247
Distribution in shelter	364
Distribution on a stabilized front	540
Antiaircraft defense:	
General principles	78, 174, 213
On the march	247, 329
In shelter	364, 366, 368
In combat	413
Antitank defense	257, 506, 508, 538, 580
Approach march	408

	Paragraph.
Armored cars:	
Assigned to cavalry	85
Attachment to reconnaissance detachment	184
Use in transmission of messages	143, 187
Armored trains	604
Army:	
Organization	5
March dispositions	291
Direction of operations	387
Army depots	605, 656, 657
Army troops:	
Composition	5
Distribution in marches	291
Distribution for combat	390
Supply requisitions	654
Artillery:	
Characteristics and missions	64–78
Fire superiority	412–414
In attack	469, 480, 481, 483, 484, 487
In defense	508, 514–516, 538, 539, 544, 545
In meeting engagenemt	443, 444, 446, 456–458, 460
In pursuit	491, 493
In river crossings	575, 580
Missions	409–411
Groupings	478, 538
Position in march column	314
Night marches	322
Cross-country marches	326
Army artillery	75, 390
Corps artillery	75, 390
Reserve	400
Ammunition supply	657, 658
Assault	457, 471, 565
Assembly positions	204, 405, 470, 550
Attack aviation	110, 113, 413, 489, 580
Attack:	
In meeting engagement	441–460
Of hastily occupied defensive position	461
Of fortified position	462–472
On a stabilized front	473–489
Night	561–565
In woods	568
River crossings	571–579
Automatic supply	646
Aviation	105–113
Axis of signal communications	90–92, 133, 496
Balloons, captive	114
Band	688
Barrage fire	538, 545
Base section, communications zone	591
Billets	361
Camouflage	125, 478, 509, 523, 524
Camps	360, 371–374, 376
Care of troops	313

	Paragraph.
Cavalry:	
Characteristics and missions	79–87
Reconnaissance	182–198
Counterreconnaissance	199, 512
Advance-guard cavalry	216, 220, 221, 225
Cavalry advance guards	233
Rear-guard cavalry	236, 237
Flank guards	241, 246
Outpost cavalry	252, 256, 278
Cavalry outposts	280–282
March unit	293, 295
Marches	294
Stream crossings	311, 571
Reserve	402
In meeting engagement	443–444
In pursuit	494
Delaying action	554, 556
Medical service	706
Cavalry division:	
Organization	3
Distant reconnaissance	182–193
Forced marches	318
Censorship	125, 729–739
Classification of supplies	586
Collecting stations:	
In combat	690, 712, 713
On the march	704, 721
Combat	378–556
Combat in woods	567–569
Combatant arms	42–115
Combat outposts	520, 521
Combat trains	216, 314, 584, 636
Combat zone	11
Command	14–21
Combined arms	42–45
Communication trenches	509, 523, 524, 534
Communications zone:	
Extent	12
Organization and administration	587–604
Shelter in	370
Supply of units in	601
Responsibility for supply of combat troops	619
Medical service	700–702
Veterinary service	716–719
Concrete shelters	525
Convalescent camp	719
Convalescent hospitals	695, 698, 714, 715
Corps	4, 387–393, 538
Corps troops	4, 291, 390, 654
Cossack posts	264
Correspondents	732–739
Counterattack	502, 519, 549, 568, 569
Counterespionage	125
Counterinformation	125
Counteroffensive preparation	538
Counterpreparation	544

	Paragraph.
Counterreconnaissance:	
General	125, 163
By air service	174
By cavalry	199
By security detachments	212, 251
Courier service	744
Credits	652, 656, 671
Cross-country marches	323–329
Defense:	
General	498–546
Night	566
In woods	569
River lines	580
Of communications zone	604
Defensive works:	
Priority of construction	511, 534
In fortified position	523–528
Defiles	310, 428
Delaying action	554
Depots	595–601, 605, 647, 654
Development	403, 404
Diary	150
Dispensaries	703
Distributing point	605, 635, 636
Division	3
Dugouts	525
Dummy works	505, 528
Dumps	533, 605
Economy of force	385, 498
Engineers:	
Characteristics and missions	96–103
Reconnaissance	202
With advance guards	216, 218
With rear guards	236
Bridge guard	311
Position in march column	314
Rail movements	349
In river crossings	571–575
Fortification of a position	530
Operation of military railways	624–628
Narrow-gauge railways	629
Inland waterways	630
Envelopment	435, 437, 445
Espionage	119
Estimate of situation	18
Evacuation hospitals	693, 695, 697, 714, 715
Examining post	270, 272
Field trains:	
With advance guards	216
On the march	290, 292, 301, 314
In shelter	363
Meeting engagement	449
Withdrawal	551
Supply	584, 636

	Paragraph.
Field orders	27–35
Finance officer	596
Fire superiority	384, 412–414
Flag of truce	270
Flank guards	240–246
Flash ranging	119, 463, 541
Fortified position:	
Attack of	462–472
Development of	522–534
Frontage	394, 395
Gas warfare	415–422, 476, 493
General headquarters	7
General headquarters reserve	7
General hospitals	701, 714, 718, 719
General orders	39
Geneva Convention	707, 722
Geologists	532
Groups of armies	6
Hague convention	705
Halts	306–308
Harassing fire	538
Holding attack	439
Hospital stations	692, 694, 695
Hospitalization and evacuation	678–722
Hospital trains	695, 699
Illumination of foreground	566
Infantry:	
Characteristics and missions	46–63
Reconnaissance	200
Advance guards	216
Outposts	252
Movement by motor transport	286
March unit	293
Marches	294, 304, 318
Development	408
Assembly for action	408
Fire superiority	412–414
In meeting engagement	453, 455, 457
In attack of fortified position	470
In attack on stablized front	485, 486
In pursuit	491
In defense	516, 517, 536, 546
In motor trucks	554, 571, 580
In withdrawal from action	549
Stream crossings	311
Ammunition supply	657
Infantry cannon	54, 216, 404, 412–414, 453
Infantry division	3, 403–405
Information	116–125
Initial points	298–302, 333–335
Inland waterways	630
Intelligence personnel	121, 125, 203, 478
Intercept service	463, 478, 541

Paragraph.
Interdiction 73, 76, 390, 415, 443, 484, 515, 538
Intermediate section, communications zone 591
Intrenchments 432, 433, 471, 509
Issue of supplies 646–658
Light signals 138, 269
Listening in 119, 463, 478, 541
Listening posts 265, 520
Machine guns:
  In defense 51, 504, 509
  With rear guards 236, 237
  In support of reconnaissance 453
  In development for action 404
  In river crossings 575
  Barrage fire 484
  Fire superiority 412, 414
  Movement by motor transport 286, 336
Main line of resistance 503, 521, 535
Marches 289–329
March unit 293, 295, 301, 306
Masks 505
Medical service:
  With advance guards 216
  On the march 308, 309, 704
  In combat 449, 687–699
  In communications zone 700–702
  In shelter 703
  In cavalry commands 706
Medical units:
  Position in march column 314
  In rail movements 349
Meeting engagement 441–460
Message centers 90, 92–95, 132, 133, 448, 496, 525
Military police 667, 723–728
Motor dispatch service 744
Motor transportation:
  Use in troop movements 283–286, 330–341
  In pursuit 492, 497
  In supply 632–641
Narrow-gauge railways 629
Navigation head 605
Negative information 122
Night attack 495, 561–565
Night defense 566
Night marches 319–322
Night operations 557–566
Observation aviation:
  General missions 107, 109
  Assignment 113
  Distant, close and battle missions 164–174
Observation posts:
  General 201, 203
  Outposts 259
  In combat 391, 427, 478, 508, 511, 523, 534

	Paragraph.
Obstacles	528
Offensive	434–489
Orders	25–41
Organization	1–13
Outguards	262–265, 520, 566
Outposts:	
General	248–282
Combat outposts	249, 510
Covering a defensive position	510
In defense of river line	580
Overhead cover	523, 525
Pack transportation	642
Parks	605, 658
Patrols:	
Reconnaissance	177–180
Cavalry	189, 192
Combat patrols	198, 200, 471, 552
Security patrols	210
Outpost patrols	274–278
Penetration	436
Photographers	733, 736, 737
Pickets	264, 265
Postal service	740–744
Prisoners of war	723, 725
Provost marshals	724, 725
Pursuit	490–497
Pursuit aviation	108, 463, 489, 549
Radio goniometry	119, 541
Radio interception	119
Radio transmission	136, 187, 195, 496
Raids	541
Railheads	605, 616–618
Railroads	285, 342–356, 606, 611
Rail shipments	650, 651
Railway service	622–628
Rear guards	234–239, 553
Reconnaissance:	
General	119, 151–162
By air service	164–173
By cavalry	182–199
By infantry	200, 404
By artillery	201
By engineers	202
By intelligence personnel	203
By commanders	204
In force	181, 466
In meeting engagement	450
In attack of fortified position	463, 466
In attack on stabilized front	479
In defense	507, 513
In night attacks	563
Of routes	297
Of sector	478, 542
Of river crossings	573–575

	Paragraph.
Reconnaissance detachments:	
General	177, 178
Cavalry	184–193, 195
Red Cross	708
Refilling point	605, 635, 636
Regulating point	333, 340
Regulating stations	356, 593, 605, 608–615, 620, 646–648, 654, 656
Relay point	605, 621, 635
Reliefs	542
Remount depots	675–677, 719
Replacements:	
Personnel	668–673
Animals	674–677
Requisitions:	
In hostile territory	585
On supply services	653, 654
For replacements	671, 676
Reserve:	
Of advance guards	219, 220, 222, 230
Of rear guards	238
Of outposts	256, 279, 282
Army and corps	392
In combat	397–402
In pursuit	492
In stabilized sector	536
Reserved roads	331, 339, 667
Reverse-slope positions	504
River crossings	218, 310, 311, 570–580
Salvage	659–661
Sea transportation	631
Sectors	406, 407, 478, 506, 508, 535, 551
Security:	
General	205–213
On the march	214–247
At rest	248–282, 365–367
In combat	383
Sentinels	264–273
Sentry squads	264
Services	294, 596, 598, 599, 601, 602
Service trains:	
Composition	645
In marches	292, 314
In shelter	363
In meeting engagement	449
In withdrawal	551
Shelter	357–377
Shelters, defensive	534
Signal corps troops:	
Characteristics and missions	88–95
Position in march column	314
Rail movements	349
In meeting engagement	448
In military railway service	628
Signal flags	138

Paragraph.
Signal projectors 138
Situation maps 121
Smoke 237, 384, 423–425, 576
Sound ranging 119, 463, 541
Special orders 40
Staff 22–24
Standard trains 342, 343, 346
Station hospitals 701–717
Storage of supplies 592–603
Supply 581–667
Supply columns 584, 635, 636, 645
Supply points 605
Supports:
  Of advance guards 219, 220, 222–228
  Of rear guards 238
  Of outposts 256, 257, 260, 261–263
Surgical hospitals 693, 695, 696
Surprise 382, 560
Switch positions 534
Tanks:
  Characteristics and missions 56–63
  With advance guard 216
  Signal tanks 63, 134, 136
  Assignment in combat 390
  Reserve 401
  In attack of fortified position 462
Telegraph 135
Telephone 135, 255
Terrain 426–431
Theater of operations 9
Tractor artillery 304
Tractor transportation 305, 641
Traffic control 662–667
Transmission of messages:
  General principles 126–131
  By technical means 134–141
  By messenger 142–149
Transportation 606–645
Transportation pools 637, 638
Troop movements 283–288
Turning movements 438
Verbal orders 41
Veterinary service 309, 679, 709–722
Water supply 313, 373, 375, 532
Withdrawal:
  Of outposts 510
  To a second position 521, 535, 536
  From action 547–553
Zone of action 406, 407, 453
Zone of the interior 10