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LECTURES ON F.S.R. II.

BY

MAJOR-GENERAL J. F. C. FULLER.

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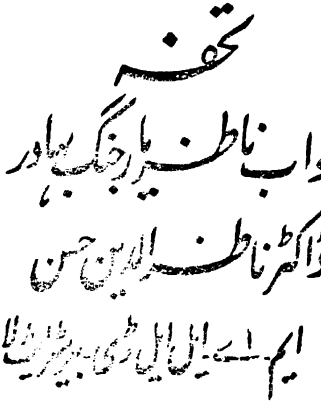

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DIAGRAMS.

N.B.—The majority of the diagrams is purely geometrical, the object being to express a tactical idea, and not an actual operation.

PREFACE.

THIS small book was suggested to me when in command of an infantry brigade. I found that the *Field Service Regulations* were read for purposes of examination, but consistently neglected in the field, especially if action were in any way hurried. The reason for this was no doubt due to lack of professional interest, but also in part to the extreme dullness of the book, especially when read by a lukewarm soldier. Dullness is difficult to avoid in an official manual, which cannot, within the limits of a few hundred pages, find room for historical examples, or lengthy explanations. Nevertheless, I do think, seeing how unimaginative the normal British officer is, that over condensation defeats its end by presenting such a host of facts that the mind of the reader becomes bewildered and weary.

To overcome this disadvantage, which is a real one, I gave to the officers of my brigade a series of lectures on *F.S.R. Vol. II,* not so much from an historical point of view as an explanatory one. The system I adopted was to take chapter by chapter and run through each, omitting what was obvious and examining what might possibly appear occult or require amplification. From time to time I asked questions, and so got officers to put forward their views, which were more critical than my own ; for when I gave the lectures I omitted criticism altogether. Here, in their written form, I indulge in it from time to time, not to belittle *F.S.R.*, which I believe to be a sound manual, but to assist those who will some day have to rewrite it. My only criticism of severity relates to certain

paragraphs concerning the use of cavalry. As long as we have marching troops, cavalry is such a valuable arm that it is quite unnecessary to try and wedge its utility in everywhere. For instance, it is pure nonsense to point out the use of cavalry in trench warfare and omit to mention the tank.

The style of the book is, as far as it is possible to write a lecture, the style these lectures were given in; consequently from a literary point of view it is no style at all. I, we, you, it, are all used in turn; many facts are repeated over and over again, for as Napoleon said: "It is by repetition that men are taught." Irrespective of its subject, each lecture is of approximately the same length, because each was of an hour's duration. In more than one I have accentuated the value of the motor car in war, not only because this is overlooked in *F.S.R.*, but because I believe it to be one of the most important problems in present day warfare. When I talk of a motor car guerilla, I do not mean a partisan, but a uniformed soldier in a motor car; he may, or he may not, be a regular, but he is a soldier of some sort, and not liable to be shot at sight.

Further, I have not attempted either to re-write *F.S.R.*, or to produce a text book on war. For long I have been of opinion that *F.S.R.* should be published in three volumes; the first two on the lines they are, and the third on future warfare. The *Manual of Armoured and Mechanized Formations,* which is about as exciting as *Bradshaw* and almost as full of figures, does not fill this bill. As one day it will have to be re-written,[1] why not turn it into *F.S.R. Vol. III,* so that it may be sanctified by their holy name? In these lectures I have not attempted to produce such a work, but by combining the highly

(1) Since writing the above, I understand that a second edition of this *Manual* has been published.

probable future with the known present, some of the mild speculations I indulge in may perhaps be considered as stepping stones towards it. Lastly, I have in no way written out these lectures with the idea of rivalry to *F.S.R.*, but solely for such as care to read them *with F.S.R.*, note their differences, and then decide for themselves as to what is right; for, as the *Manual of Armoured and Mechanized Formations* insists upon, our chief requirement to-day is an open and flexible mind.

J. F. C. F.

INTRODUCTION.

WHETHER we are soldiers or civilians, and no matter what our work is, two things will help us above all others, and these are: "What to think," and "How to think." Every piece of work requires some information culled from the experiences of other people, and as in war no one piece of work is identical to another piece of work, slavishly to follow this information must obviously end in indifferent craftsmanship. If fighting battles could be standardized, like making motor cars, it would be possible to lay down a series of rigid rules. This has often been attempted in war, and in the end has always failed, because no one battle is similar to another battle; for though each single battle has something in common with every other battle, it possesses also something which no other battle includes. Therefore, "What to think" of itself is not sufficient; it may be said to supply the raw material—historical facts, etc.—in which "How to think" operates. "What to think" supplies us with bricks and mortar, "How to think" with craftsmanship. Both are all important and complimentary, for the greater our knowledge, the greater, so to speak, the capital at the disposal of our originality.

Now *F.S.R.* are often called our military bible, which is exactly what they are not; for the Bible no more than the plays of Shakespeare changes, whilst *F.S.R.* are always changing, every few years sees a new edition, and each edition, growing on the food of "What to think," digests this food in the terms of how to think about it. They are a scientific text book on war, a syn-

thesis of historical experiences common to all military operations, which are embodied in the principles of war. They are also a speculative work suggesting rather than dictating, how these principles can best be applied in the circumstances which surround us to-day. They are pre-eminently a guide to action, in which a common doctrine is laid down that in no way should be considered a rigid dogma. They are a book written not to excuse us from thinking, but to assist us in our thoughts. They are a strategical and tactical atlas which shows us the best roads, but does not prohibit occasional short cuts. They are a work not to be learnt by heart, but to be thought over, for with ease they could be expanded into many volumes.

The present edition is far more logically arranged than former ones, and it is important to realise what this arrangement is, for in itself it will show us how to think logically.

The first ten chapters may be divided into three categories, namely:

(a) Principles of War— Chapter I.
(b) Instruments of War—Chapter II.
(c) Conditions of War— Chapters III to X.

The first are the foundations of doctrine, they are drawn from what is common in all military operations; the second are the tools we are given to work with, which change from time to time; and the third are the circumstances in which we are called upon to use our tools according to the principles of war, which are no more than guides in working out a common sense plan. Conditions are the main difficulty in war, for they are as unstable as the elements. It is possible to say what a theatre of war is like, but it is impossible to predict with certainty what the enemy is going to do in it. Chance

plays a harlequin's part in war, and is a condition which can be taken advantage of, if knowledge of "What to think" is extensive, and our power of "How to think" is high. And "How to think" is to think like lightning, to see conditions in their simplest form, that is as a compete picture and not as a broken up puzzle; to apply principles automatically, as a musician plays a tune without thinking of the notes, and to use weapons understandingly, like a skilled carpenter uses his tools.

Napoleon once said: "I have always liked analysis, if I were to be seriously in love, I should analyse my love bit by bit *Why?* and *How?* are questions so useful that they cannot be too often asked. I conquered rather than studied history; that is to say, I did not care to retain and did not retain anything that could not give me a new idea; I disdained all that was useless, but took possession of certain results which pleased me." In others words, he taught himself "How to think" which is the harvest of all true education, civil or military.

LECTURE I.

CHAPTER I.

ARMED FORCES, THEIR COMMAND AND THE PRINCIPLES OF WAR.

1. Introduction.

On the first page of *F.S.R.* we are confronted by a difficulty which is a very real one to some soldiers, that is the meaning of the words strategy and tactics. Many definitions have been attempted, but in place I prefer an explanation.

Strategy is the art of moving armies towards the battlefield in such a way that when the battle takes place it will be fought at the greatest advantage; consequently strategy is the foundation of planning, which is the main duty of the general. Strategy requires that an army be well fed and supplied during rest and movement, therefore that the line of communications leading to its supply base is protected. As supplies are just as essential to the enemy's army, it should also aim at cutting, or threatening to cut, the enemy's line of communications; for the easiest and cheapest way to defeat an army is not to fight it but to prevent it from filling its stomach. Strategy also demands that the government is protected; for the government represents the war brain of the nation, and the army the weapon it wields. Strategy should aim either at surprising the enemy when the battle takes place, or at concentrating a superior force against a weak point. We see, therefore, that strategy is a complex art.

Tactics is the art of giving battle, that is of fighting,

it is the main duty of the leader. As I shall soon again point out, it is composed of three elements—protection, movement and offensive power; or expressed in other words—guarding, moving and hitting, which are common to a fight between two men, or to a battle between two armies. In boxing, a man first assumes a defensive attitude, this is his tactical base of action; then he begins to move about the ring, always with the idea of placing himself in such a position that he can give blows without receiving as many, or as severe ones, as he gives. His ultimate object is to knock his enemy out, not by hitting him anywhere but at a vital point—the jaw or pit of the stomach. Not so much because such a blow will injure his adversary's body, but because it will upset his brain. The brain of an army lies in its command—its general, and the knock-out blow is the upsetting of his plan. Thus we see that the object of tactics is to fulfil strategy, the accomplishment of a plan by upsetting the enemy's plan.

2. The Nature of War.

To turn from the art to the nature of war, here we are confronted by an immense subject, which condensed into fourteen lines shows how important it is to expand the knowledge contained in *F.S.R.* by reading military history.

In the past there have been various origins of war, such as slave hunts (many of the Roman wars), conversions (the early Islamic wars), relic hunting (some of the Crusades), and wars of religion such as were waged in Europe during the sixteenth and seventeenth centuries. To-day, however, the outstanding cause of war is economic, it is connected with trade, markets, sources of supply, commerce and wealth. The true origin of the World War was such.

Warfare can be divided into two great categories, namely civil wars and foreign wars, and foreign wars in their turn may be divided under two headings—great

wars and guerilla wars, (See also Lecture XV). The first are generally waged against highly organised nations, and the second against less well organised, such as the North-West Frontier tribes of India, when they are usually known as small wars. It must not be overlooked, however, that guerilla wars may run concurrently with great ones, wars of the first magnitude, as happened in the Franco-Prussian war. This is likely to recur in the future in the case of the motor car guerilla, who is already known in peacetime as the motor car bandit.

All wars, whatever their nature may be, normally assume two forms, namely, field warfare and siege warfare, and as pressure always begets resistance the more prolonged a war becomes the more formidable does siege warfare grow. In its turn it has two forms: the attack and defence of fortresses, and the attack and defence of field works—trench warfare.

The means of waging war are the means of waging peace. Practically everything which in peace time possesses energy, can in war time be turned into war energy—newspapers, sewing machines, motor cars, dye works, watch factories, royal academicians; in fact all industries, trades and professions; all the moral, physical economic, intellectual, and even spiritual, forces of the nation. At the apex of all these we have the navy, army and air force which can attack the enemy physically, economically and morally, that is by fighting, starvation and terror. These, by breaking down resistance, enable the government to enforce its will upon the enemy's government in the terms of the peace treaty. In small wars the normal difficulty is the lack of a central government to treat with.

3. The Armed Forces.

An armed force differs from an armed mob, or crowd of men, not so much in its armament but in that it is disciplined, is organised, and is under control. A crowd

may at times be courageous beyond belief, but it possesses little staying power, and is as quickly depressed as elated by outward circumstances. Courage in itself is insufficient, and to it must be added what is called morale, a complex quality depending upon honour to the cause, loyalty to the leader, confidence in one's skill and the skill of one's comrades, and in an innate feeling that everyone is doing his utmost to win and that no one will leave a comrade in the lurch. Morale endows a force of men with a feeling of superiority and invincibility, it is cultivated by common-sense, sound organisation, efficient arms and equipment, and the realisation that those in command are skilful, brave and just.

Organisation, *F.S.R.* tell us, "must allow for . . . protection, movement and offensive action which, used in combination, constitute the operations of war." Here we have our three friends the elements of war, the foundations of tactics, and consequently the foundations of military organisation through which tactical ideas are expressed in the form of tactical actions.

Given disciplined men, fitted together in a tactical organisation, the third consideration is the control of this human machine once it is set working, and its maintenance and sustenance when in action. At one end of the system of control we have the government, at the other the section commander, and in between a number of controlling organs. Thus the government is advised on matters of policy by the chiefs of the navy, army and air force forming a sub-committee of the Committee of Imperial Defence.

Through the Secretary of State for War, the first civil member of the Army Council, the government controls the army, which in peace time is divided into commands, and in war time into armies, army corps, divisions, etc., each link, so to speak, distributing control. Control in the field, no matter how small the force may be, depends upon sound information of the enemy and of

our own troops, rapid decision, rapid communication of orders, and intelligent obedience.

4. The Employment of the Armed Forces.

The ultimate foundations of a nation's strength are to be sought in the morale of its people, their self-sacrifice and willingness to see the war through. This morale is the soul of government, and when a government is deprived of it, it becomes a corpse. To attack this morale, three means of action are possible:

(a) A direct attack upon the will of the people by air action, an operation prohibited by international agreement.

(b) A blockade of the enemy's territories in which normally the Navy plays a leading part.

(c) An overthrow of his armed forces by military action, and the occupation of his country which is a visible sign of his defeat.

The combination of all armed forces in one plan directed by policy is frequently called grand-strategy, better, possibly, political strategy in contradistinction to field strategy.

5. The Command of the Military Forces.

"The principal duty of a commander is to make decisions," that is to make up his mind and say "yes" or "no" in such a way that there is no mistaking that he means "yes" or "no." Information is supplied to him by his staff, but his staff should have nothing whatever to do with his decisions. They may help him load his mental gun, his mind, but they are not there to help him fire it. Only one finger can pull the trigger if mental shooting is to be accurate. The commander is responsible for his plan, its essentials are his, its details he may well leave to his staff.

Decision demands resolution, "that dauntless spirit of resolution," as Shakespeare calls it in his *Henry the Fifth*; it demands insight, not only of the enemy but

of the staff, for much depends on their work and the personality of each worker. It demands imagination and foresight and an intuitive application of the principles of war.

The common deficits in command are lack of balance, sudden elation or depression, fear of what the enemy is going to do in place of concentration upon what you are going to do to him; setting tasks which are outside the ability of the troops to accomplish; over caution and waste of time; calling conferences in order to pick the brains of subordinates, and lack of originality which often leads to doing something which the enemy expects in place of what he does not look for.

When he has made up his mind, a commander must allot his tasks clearly and precisely. Then, if time permits, he may call a conference in order to check what his subordinates intend to do, and modify any action which does not carry out his leading idea—the object of the operation. Whatever he decides, and whatever his subordinates decide, he remains responsible; consequently delegation of work, so often necessary, in no way absolves him from responsibility. A commander who thinks that he can shift responsibility on to his subordinates is not fit to be put in charge of a corporal's guard.

6. The Commander's Plan.

When a commander has made up his mind his ideas are set forth in his plan, which normally is issued to his subordinate commanders in the form of an operation order. It is right that his staff should make out this order, because it will contain a great deal of detail which is better known to them. It is wrong that the commander having arrived at a decision should turn to his staff and merely say: "On Thursday next I intend to attack the enemy's right flank—work out the orders." This is quite insufficient, for to throw out a general idea like this means little or nothing. Before he arrives at such an

idea he must briefly or in full, according to the time at his disposal, appreciate the situation (See Lecture XV), and with the utmost care explain this appreciation to his staff, so that they are saturated with his ideas. This appreciation should be his and no one else's; it may be compared to a series of rough sketches from which his staff work out a clear and simple picture.

The plan is nothing more than the means fitted to an end, and in fitting means to ends, use is made of the principles of war, and between the means and the end in view lie all the conditions of war, each of which will influence the application of these principles. The plan is the foundation of the operation order which transforms its ideas into definite actions.

7. The Principles of War.

We now come to the much discussed principles of war. They are not "blessed words" like "Mesopotamia," but simply common-sense ideas. A principle is nothing more than a generalization of observed facts. For example: At sea level it is a principle of cookery that it takes eight minutes to boil an egg hard; but on the top of Mount Everest you might boil an egg for an hour and yet it would remain soft. Does this mean that this principle is valueless? No, it means that its correct application depends upon circumstances, in this case—atmospheric pressure. It is for this reason that *F.S.R.* call the principles of war "common sense principles." Common sense is action adapted to circumstances, and in the case of the egg to circumstances of air pressure, and in case of, say, offensive action, to circumstances far more difficult to gauge, because the human factor is a variable quantity. Where is this factor to be discovered in its most vigorous form? In the heads of the two opposing commanders, that is in their respective objects. As these objects may be compared to the pivots of their plans, it is obvious that each commander will strive to maintain his object, for to change it means a

change of plan, and a change of plan means a reshuffling of units and consequent friction and loss of time. The maintenance of the object stabilizes not only order and organisation but also morale and confidence. In war few things are more upsetting than a change of object.

It may be as well here to point out that there are three controlling objects in every war. First, there is the political, or grand strategical object, the destruction of the enemy's civil will, the aim of which is to compel his government to abandon the war. Secondly, there is the strategical object, the destruction of the enemy's plan, the aim of which is to compel him to reshuffle his ideas and his troops and so throw his army into a state of mental and physical disorder. Thirdly, there is the tactical object, the destruction of the enemy's army, the aim of which is to accomplish the strategical object and through it attain the political object.

In each case the decisive point, the objective to be hit at is in rear. Thus, the will of the people is behind the government, the plan of the general is behind his army, and as regards the army, obviously the most vulnerable point of attack is, as in the case of the individual fighter, its back or rear. Tactically this is the decisive point of attack. Usually it is well protected by the front and cannot be directly hit at, in which case the next best place to strike is at a flank.

The decisive time to strike is when the enemy does not expect to be hit, or when he is unable to protect the locality at which the blow is aimed. Consequently, it is all important to distract his attention by feint or bluff, and to compel him to exhaust or deplete his reserves before the decisive blow falls. We see, therefore, that the main ideas in battle are :

(a) To distract, that is to bewilder the enemy.
(b) To fix, that is to deprive him of the power of movement.
(c) To manoeuvre, that is to make the utmost use of our own power of movement.

(d) And to hit him unexepectedly, or in superior force, at the point selected.

Hold, move, hit, are three tactical conceptions to which I shall again and again refer.

Now as regards the principles of war, which indirectly I have already discussed. I have made mention of three tactical elements—protection, movement and offensive power, or guarding, moving and hitting. From these are derived three principles, namely, the principles of security, mobility and of offensive action. Security protects and maintains power to move. Never allow the enemy to fix you, for this is like being checked, and often check-mated, at chess. Secure mobility is the main spring of strategy.

Again, security protects and maintains offensive power, which when used becomes offensive action. The more strongly offensive action is protected, the more effective does it become, consequently protected offensive action is the main spring of tactics, the aim of which is to maintain movement until the ultimate object—victory—is gained.

We thus see that these three principles of war must be combined, that is work together like the parts of a machine. As this is a fact of vital importance, to the above three principles we add a fourth, the principle of co-operation.

I have already mentioned distraction, the bewildering of an enemy, hitting him unexpectedly, doing something he is not prepared for, and using superior force against the point at which it is intended to hit him. From these various conceptions we obtain two more principles, those of surprise and concentration, which are closely allied, for surprise is moral concentration. You may surprise an enemy with his eyes shut or open. In the first case you do something he does not expect, in the second something he is unable to meet. The main spring of the first is novelty tempered by audacity, of the second—the fixing of the enemy so that he cannot move.

Concentration of force does not necessarily mean numerical superiority on the battlefield, in place superiority or weapon power at the point of attack. Its most profitable application is when it is combined with surprise, for the greater the surprise the more can man and weapon power be economised. This brings me to the last of the principles of war, namely, economy of force.

Economy of force means no more than the most profitable utilization of force, which first of all depends on correct distribution between protective troops, offensive troops and reserves. Surprise economises, concentration economises, security economises, and so also do successful offensive action and sustained mobility. The aim of a general is not only to win victories, but to bring the war as rapidly as possible to a successful end. Each battle should be a distinct stepping-stone to this end—the crossing of the river of war. There should be a combination between battles, just as there is a combination between units in each battle, therefore economy of force may be compared to co-operation on a higher plane. It is a clinching principle from which all other principles spring and into which all in the end dissolve.

8. The Application of the Principles of War.

The application of the principles of war largely depends on individual predilection. Their main and most important use is undoubtedly to assist us in making up our plans, and in the correct changing of these plans as circumstances change. The method I employ myself is as follows: I think first in terms of economy of force, bearing in mind the object I am out to attain, the means at my disposal and the conditions as they are known to me, giving the enemy always the benefit of the doubt. This enables me to make a provisional distribution—such and such a force to protect, to attack and to be held in reserve, and such and such for feints, escort work, etc. I then think in terms of concentration and surprise, and

at once begin to modify my provisional distribution. I have now got a fair idea of my plan in the rough. Next in detail I think out the security problem which is the base of action of the offensive problem, check my provisional offensive distribution and work out my movements problem in terms of time and space. Finally I check the relationship between all parts of my distribution and see that each part can co-operate in carrying out the object.

There may be better methods of using these principles than this one, but the important point to remember is that all principles should be used and not one or two, and that their relationships are the things which really matter. Like musical notes they assist us to play a strategical or tactical tune; and like a musician we should think of the tune and not of the notes themselves, though at every moment we are making use of them. Battles played with one finger, even if successful, are not works of art.

LECTURE II.

CHAPTER II.

FIGHTING TROOPS, THEIR CHARACTERISTICS AND ARMAMENT.

9. General.

From the principles I will now turn to the instruments of war, yet at once I am compelled to revert to that clinching principle—co-operation. Co-operation, among other things, does not mean using every arm or weapon on every occasion; this is confusion and waste of force. Co-operation is common-sense action, the fitting together of various parts, for each weapon, like a tool in a carpenter's bag, possesses a special purpose or function. A good carpenter makes no mistake as to the proper use of a pair of pliers or a hammer, a gimlet or a plane, he knows how and when to use each, and so must a good tactician do the same with his arms and weapons.

Does there exist such a thing as a common theory upon which all arms at any date in history have been organised? Yes—the three principles of war, security, offensive action and mobility. These give us three categories of arms:

(a) Protective arms.
(b) Arms suitable for attack and defence.
(c) And arms suitable for reconnaissance.

To reverse the order: No army can be considered highly organised unless it can find its enemy, hit him, and protect itself from being hit. An army is no more than a mass of men, and as we know that guarding, moving and hitting are tactical essentials in the individual

fighter, so we may gauge that they are of equal importance in a mass of fighters.

These three factors, finding, hitting and protecting, have been for several centuries now represented by cavalry, infantry and artillery. History tells us that arms are constantly changing, bows give place to muskets, muskets to rifles, rifles to machine guns, and so on; yet history also tells us that no new tactical factors have been discovered, and, in spite of all modern inventions, in essence they remain just the same as they were thousands of years ago. Nevertheless, in form weapons are constantly changing, and never more rapidly than in this present age—for to the older arms have been added aircraft, armoured cars, tanks, etc. One of the great difficulties to-day is that they are changing so rapidly that we have scarcely time enough to organise them in such a way that a general co-operation will result. The main organisation difficulty is to combine the action of the newer arms with the old.

Before examining each arm in turn, it will, I think, make things clearer if I enumerate all arms mentioned in this chapter. They are: infantry, cavalry, mounted rifles, artillery, tanks, armoured cars, engineers and aircraft. Smoke and gas are not arms but special weapons.

Having listed these arms, the next step is to classify them according to their primary functions. This may be done as follows:

(a) Arms to protect —Artillery and engineers.
(b) Arms to attack —Infantry and tanks.
(c) Arms to reconnoitre—Cavalry, mounted rifles, armoured cars and aircraft.

These are the primary functions of these arms, but arms to be efficient in war should also possess the remaining two functions in part, and this they generally do. Thus, armoured cars can attack as well as reconnoitre, but their mobility is considerably limited by ground. Tanks can protect themselves against all the smaller projectiles by armour, but must be protected

against shell fire. Infantry machine guns have high protective power, but at present low mobility. Engineers can strongly influence mobility, but have little offensive power, and aircraft have considerable offensive value against suitable targets, but little protective power against well directed fire.

The ideal arm is one which possesses its primary function in maximum and the other two in a high degree, and undoubtedly at present this arm is the tank.

10. Infantry.

There appears to be some confusion of thought in this section, a halting between the ideas of infantry as this arm was, and what in the last war it proved itself to be. This is apt to bewilder the mind of the student. We are told that "the main object of infantry . . . is to close with the enemy and destroy him." Then we are told that this demands superiority of fire; that numbers are unlikely to produce this superiority, and that infantry in the defence are stronger than infantry in the attack. In brief, that infantry cannot close unless strongly assisted by artillery or tanks. When such a happy climax to the attack as closing with the enemy does take place, as the last war proved very clearly, either the enemy has been slaughtered, or he has withdrawn, or he surrenders without a struggle; consequently there will seldom be any need to destroy him, for to all intents and purposes he will be already destroyed. I hope that this confusion of thought will be disentangled in the next edition of *F.S.R.*

The old idea of the assault has long vanished from practical tactics. Seventy years ago in the American Civil War, when soldiers were armed with muzzle-loading rifles, seven assaults out of eight failed, and bayonet wounds were almost unknown. In the Franco-Prussian war no single frontal attack succeeded. In the South African war we frequently had to increase the intervals between attacking files to fifty paces, which in itself

prohibited an assault. In the Russo-Japanese War practically all successful attacks were outflanking ones, and in the World War inability to assault was proved by the extensive use of trenches.

These quotations are given not to contradict the *F.S.R.* but to support them, for in paragraph 5 of this section we read: "Infantry acting defensively has little to fear from hostile infantry attack which is unaided by other arms"; and in the last war we learnt what enormous masses of artillery and what numbers of tanks were required to break through defended positions. The fact is that the old frontal attack culminating in the assault is no longer a profitable operation, any more than at sea it is profitable for one battleship to attempt to ram another. It is now the exception and not the rule.

What then is the role of infantry in battle? The answer is, "a skilful system of fire and manoeuvre." Bearing in mind that infantry is seldom called upon to operate on their own; what does this exactly mean?

Before answering this question let us think out the conditions which influence it. Infantry are very dependent on the nature of the ground, and in the attack look to the ground for their main protection, and so prefer broken to open country to fight over. Infantry on the battlefield possess an exceedingly low mobility, under exceptional circumstances they can advance half a mile an hour. Infantry possess enormous fire power. A battalion can fire, if necessary, 20,000 rounds of S.A.A. a minute.

Now let us revert to the principle of co-operation, and out of our tactical bag take another weapon—the tank, which is bullet-proof, possesses a high mobility over open country, but the fire power of which is far from accurate when on the move.

If the ground over which the infantry is advancing is unsuited to tanks, then infantry are only likely to be opposed by infantry. As in this case the enemy will move slowly, the aim of the attacking infantry is, obviously,

to pin him to his position by fire power, and once he is pinned down slowly to percolate forward. At length this forward movement will become too costly and a clinch will take place. Then from this static situation should the mobility of the tanks be developed, or, should tanks be unattainable, or the ground unsuited to their use, one or both of the enemy's flanks should be attacked by fresh forces of infantry.

I think from this we see quite clearly what infantry can do. Assuming that tanks (formerly it was cavalry) are working with them, the infantry form the base of tank action; for a held front often means an attackable flank. No arm, however powerful, can securely act without a base of action. To-day, infantry *found* victory by establishing this base, and they *confirm* victory, as the *F.S.R.* say, by moving this base forward once opposition has been broken down. As occupation of an enemy's country shows that he has lost the war, so the occupation of a battlefield shows that a victory has been confirmed. Holding by fire and occupying by movement are the two main duties of infantry in battle.

11. Cavalry and Mounted Rifles.

Cavalry were once the predominant arm in pitched battles. When pike held pike in the clinch (now represented by machine gun holding machine gun), they manoeuvred against the enemy's flanks and rear and struck at the decisive point. They did what I have pointed out tanks can do in present-day warfare, and in their day they did it very well. To-day, cavalry, who are virtually mounted riflemen, for their swords are of quite secondary importance, possess very little striking power, on account of their vulnerability to rifle and machine gun fire, and their inability to answer this fire when mounted. They possess, however, one advantage over every existing mobile arm, namely, that of being able to split and squander and search an area thoroughly; they are consequently eminently suited to

protective, or tactical, reconnaissance work, such as scouting for a marching column, working with an advanced, flank or rear guard, or reconnoitring positions in the vicinity of a line of march. For strategical reconnaissances cavalry regiments, (not yet all) are equipped with armoured cars.

Tactical reconnaissance does not generally require large numbers of horsemen. The Boers in the South African War of 1899-1902 worked on the admirable system of picketing our columns, in place of closely protecting their own. Once contact was gained, touch was seldom lost. If attacked they withdrew, and when the attacker fell back they returned. The result was that as their columns knew everything about ours they lived in comparative safety.

When fighting is likely to take place, and strength is consequently required, this is better obtained by attaching mechanized artillery and motorized infantry to small forces of cavalry than by increasing the size of these forces; for the larger a cavalry force is the less mobile it becomes on account of its forage requirements.

12. Artillery.

Artillery is pre-eminently the protective arm in field warfare, and the offensive arm in siege warfare, because the bullet, which is the main offensive weapon in the field, is impotent against permanent fortifications and well constructed field works. In the World War the French had a saying, "artillery conquers, infantry occupies." This saying clearly defines the pivotal tactical idea in attacks against trenches and fortifications.

In every highly organised army there are to be found two categories of artillery, namely, guns and howitzers. The predominant characteristic of both is depth of range. The difference between these two weapons is in the curve of the trajectory of their projectiles; whilst the trajectory of a shell fired from a gun is comparatively flat, that of a shell fired from a howitzer is curved, and

consequently this weapon is most useful in searching areas behind such obstacles as woods and hills. Had Napoleon, an artillery officer by training, better understood the use of the howitzer, Wellington would never have been able to remain in the covered position he occupied at Waterloo.

The main limitations of the horse-drawn gun are that it possesses small power of local protection, its team is very vulnerable to small arm fire, and its mobility in the field is low, mainly on account of the time taken in establishing observation posts and laying out communications.

All forms of artillery, except guns detailed for anti-tank and anti-aircraft work, use indirect laying, that is to say they no longer fire over the sights, but from behind protective positions, using observed or predicted fire. The first is controlled by direct observation from O.P.'s, and the second by map measurements; this form of fire generally demands surveying, and aeroplane observation. The fact is, and as to this there can be no doubt, that modern artillery fire has become so complex and slow that any idea of rapid and sustained infantry advances protected by gun fire is out of the question.

Being protective weapons, the gun and the howitzer normally co-operate with the other arms, and this co-operation can be greatly improved and speeded up if the other arms select areas of attack which offer to their supporting artillery the best possible observation. The main difficulty in arranging this is, that infantry look for covered approaches and broken ground to advance over, whilst artillery require open ground to see over.

When tanks are not employed, artillery is the backbone of the attack and the defence. Therefore, in battles without tanks, the first consideration is the placing of artillery, because it forms the base of offensive and defensive action. In such cases this base can be placed at a considerable distance from the infantry, and if possible outside the bullet zone. But if the enemy possesses tanks,

and his opponent has none, or only a small number, it is suicidal not to bring as many guns as possible forward into positions from which they can open fire upon the enemy tanks before the attacking or defending infantry are overrun. The difficulty here is the vulnerability of the gun teams and gunners to small arm fire once they are brought into the bullet zone, and the only practical solution to this problem is armour.

To-day we hear much talk of mechanized artillery, but in fact such artillery does not exist. Guns drawn by tractors, dragons and six-wheeled lorries are motorized and not mechanized, for mechanization, in its military sense, carries with it the idea of armour—direct protection against bullets. Motorized guns are extremely mobile, especially for road work, and less vulnerable to bullet fire than horse drawn ones; but, on the battlefield, if brought into the bullet zone, their vulnerability is still high. Mechanized guns, such as the self-propelled gun (at present experimented with in our army), can be rendered bullet-proof, and can operate not only in rear of the infantry, but, if necessary, in advance of them; they are also eminently suited to co-operate with tanks.

13. Armoured Units.

The first paragraph of this section is so admirable a summary of armoured weapons that I will quote it in full, and then examine it in some detail.

"Armoured units possess the characteristics of fire power, mobility and protection by armour.

"These three attributes are interdependent. The protection afforded by armour enables fire to be developed during movement, and in spite of opposition. They are essentially units of offence; they exercise great moral effect, and are capable of acting independently or in co-operation with other arms the movement of which they can facilitate by their fire action.

"Their wide radius of action, which is limited by their petrol capacity and by the physical endurance of

crews, enables them to strike a blow not only against an enemy's flanks, but also against his headquarters and his rear services. Their mobility enables them to withdraw quickly after an operation has been completed, and to make considerable detours in a short time, in order to utilize the most suitable terrain."

The first point which strikes us is, that the tank combines within itself the three tactical elements in a higher degree than any other arm. The second is, that whilst infantry halt to fire, tanks move to fire; in the one case it is fire *and* movement, in the other fire *in* movement. In the difference between the "and" and the "in" is to be discovered one of the greatest tactical revolutions in the history of land warfare, for it begins to approximate this form of warfare to that waged at sea—the quick moving fortress in place of the slow moving man. This fact alone tells us that the predominant characteristic of the tank is offence.

Armour enables these weapons to act independently, which in the case of cavalry and infantry is becoming more and more difficult; petrol enables them to outflank rapidly, consequently to the revolution created by the moving self-protected firing line, we must add the increasing likelihood of highly mobile warfare and the rear attack, that is the true decisive attack.

What does this mean? It means a return to the old cavalry theory of warfare which may be called "area warfare" in contra-distinction to "linear," or infantry, warfare. Warfare in which there is no fixed front, because the front no longer protects the headquarters and rear services, the brains and stomach of the army. Infantry warfare may be compared to an umbrella in a steady shower, it protects the body except for a few splashes; cavalry warfare—an umbrella in a gale of rain, all the lower part of the body is drenched. Area warfare means that the old linear front must be curved into a circle, consequently all-round protection, at rest or on the move, is becoming more and more important.

There are two main types of armoured weapons, tracked and wheeled—tanks and armoured cars. The first is divided into three classes—medium, light and close support tanks, which would be better named combat, reconnaissance and artillery machines, for these three classes represent the hitting, finding and protecting elements in tactical organisation.

The armoured car is a powerful reconnoitring machine. Some think that its days are numbered, and that it will be ousted by the light tank. This may be so, but it should not be forgotten that in the next war between civilized nations the motor guerilla will swarm, and that armoured cars are likely to prove most useful weapons in this type of warfare.

Finally, a point apt to be overlooked in peace time, but one which will at once be manifest in war, is the enormous moral effect of armoured machines against unarmoured troops. Even when unarmoured troops are equipped with powerful anti-tank weapons, as these will mainly be of a static nature, they will not be able to fix the enemy's tank forces. To be deprived of this essential tactical power will lead to incessant alarms and consequently to despondency. Even the distant noise of hostile machines may result in loss of rest, in jumpiness and panic. To attack the enemy's nerves is quite as important as attacking his body. To live with a nagging wife is sometimes even more intolerable than to be mated to a bruiser.

14. Engineers.

Strictly speaking the Royal Engineers are not fighting troops, though they are partially trained as such. In the field their two main duties are to stop and facilitate movement, by constructing defensive works, erecting or destroying obstacles, and building or demolishing bridges, roads and railways.

In mobile warfare, normally they should superintend the construction of defences, but in siege warfare they,

as experts, should largely control this work. One of the mistakes we made in the last war was, that when mobile warfare ceased, the engineers were not put into full direction of the construction of field works. Had this been done much time and labour would have been saved.

As the influence of armour on tactics is likely to make warfare far more mobile, one of the main duties of the engineers will undoubtedly be to assist and restrict this mobility; their importance in battle is, therefore, likely to grow.

15. Aircraft.

The predominant characteristic of aircraft is mobility, and their main tactical defect lack of protection. When co-operating with the army, aircraft have three main duties—reconnaissance in all its forms, and offensive action and protective action. As regards the second, an army runs a great risk unless air superiority is first gained, which is normally accomplished by inducing hostile concentrations of machines by bombing some vital point. These bombardments, though at times they may not be very destructive, are always extremely demoralising. It may be accepted as a rule that the bombing of an industrial town will disorganise all work for at least twenty-four hours, and that even the threat to bomb will cause much loss of time.

Once local command of the air has been gained, bombing can be supplemented by low flying attack, which if directed against stationary headquarters, columns on the march, transport parks, railheads, or troops retiring in disorder, may at times produce the most startling results.

Anti-aircraft defence, which is steadily growing in power, may be divided into three categories:

(a) Attack in the air by aircraft.

(b) Attack from the ground by gun fire, or machine

gun fire, assisted during night time by search-lights.

(c) Attack on the enemy's ground organization by tanks, armoured cars and armed motor cars.

The third category, little considered to-day, is likely to play an important part in war, because frequently it is impossible to select landing ground within defended areas; further, landing grounds and workshops are the rear of an air force, and consequently the true vitals to strike at.

16. Smoke.

Smoke is purely a protective weapon unless it is of a toxic nature, when, for convenience sake, it is better placed under the category of lethal gases. There is nothing novel in its use, for, in the days of the flint-lock musket, volleys were fired at close quarters quite as much to cover the bayonet charge by smoke as to inflict casualties. When, at the battle of Fontenoy, 1745, Lord Charles Hay of the 1st Grenadier Guards stepped out of the line, took off his hat and, drinking to the French from a pocket flask, exclaimed, "Gentlemen of France, fire first," he mixed a good deal of common sense with his politeness, and proved himself to be a tactician as well as a man of breeding. When some fifty years ago smokeless powder came into use the value of smoke was forgotten, but to-day it is once again recognised as a means of screening operations and producing artificial fog.

17. Gas.

Gas is a projectile which possesses the advantage over high explosive shells or shrapnel in that it does not require aimed fire, further, it is just as effective whether an enemy is in a trench or in the open. When using it, it is only necessary to know that an enemy is occupying a certain area and that the wind is blowing

in the right direction, in order to make certain of hitting every living creature within its effective radius. It is out of all comparison the cheapest form of attack, and the most effective against an enemy unprepared to meet it. Its transportation is, however, cumbersome, consequently it is more suited for siege than for mobile warfare.

It is interesting to note that the only arm which can be made completely immune against all forms of gas attack is the tank, and that when vesicant chemicals, such as mustard gas, are used, their main advantage is that they wound far more than they kill, and a wounded man may generally be looked upon as a microbe of demoralization. A dead man can say nothing, but a wounded man can say much, and often spreads alarm and despondency wherever he goes.

LECTURE III.

CHAPTER III.

STRATEGICAL PRELIMINARIES TO JOINING BATTLE.

18. General Considerations.

This is a short chapter, yet one of vital importance to the higher command. The French have a saying, that it is the first step which counts, and this saying is most true in war, for if at the outset a wrong step is taken the whole of the initial plan may be shattered. The stability of a house depends on its foundations, so also does the stability of a campaign, and its foundations are the initial plan.

In initial plans, as well as others, two mistakes are frequent, namely:

(a) Painting a mental picture of what the enemy will do, and acting on this supposition.

(b) Doing what the enemy obviously expects; this point I have already mentioned.

As regards this second mistake, the Dardanelles landing offers us a normal example. Avoidably or unavoidably, the landing places selected were obvious ones; consequently they were held. By far the most successful landing was effected at a point to which a number of boats were carried by the current, and at which it was never intended to land. Normally, the strongest natural features are held by the weakest garrisons. Many a castle has fallen because its strongest bastion has been weakly manned.

The plan must, therefore, be flexible and original.

Napoleon once said that he never worked to a fixed plan. What did he mean? He meant that his distribution of force was so flexible that whatever the enemy did he could change his direction without changing his controlling idea. His Jena campaign is a wonderful example of this flexibility, which in itself is economy of force.

In the last war, both the German and French plans were founded upon mental pictures, and both broke down. The Germans were of opinion that numerical superiority was the decisive factor, and the French that it was the bullet and bayonet in the attack. The German plan nearly succeeded, not that it was a sound plan, it was not, for the entire forces of the empire were put into the front line, and all flexibility was lost through lack of reserves; it nearly succeeded because the French plan was the worst ever hatched outside a lunatic asylum. In spite of the then recent lessons of the Russo-Japanese war, its controlling idea was a frontal attack of all armies on the battle of Cold Harbor pattern tried out by General Grant with disastrous results in 1864!

Turning to our own campaigns, their foundations are peculiar, for they one and all demand a sea passage. This in its turn demands command of the sea. In fact, as some one once said, "Our army is a projectile fired by our navy"; consequently we are compelled to limit the size of our military forces, because the projectile thrower, the navy, is an exceptionally expensive machine.

This peculiarity, however, has one great advantage, as long as command of the sea is ours, the political and administrative bases of the army are secure. Nevertheless in the last war the submarine and the aeroplane showed us that they could be attacked, if not as strongly as their continental counterparts, yet in a sufficiently formidable manner to introduce new and perplexing protective problems.

It also has a distinct disadvantage, namely, the establishment of forward administrative bases in either

a friendly or a hostile country; for example, in the last war—France and Gallipoli.

We are told that strategical concentration must be completed without serious interruption by the enemy. This in a hostile and well organised country is almost impossible unless the time at present taken to do so is vastly cut down. In the past, military and naval conditions gave us a greater choice of landing places than is usual to-day. Aircraft, wireless, submarines and motor cars have greatly modified such operations. A hundred years ago a fleet could be lost at sea, as Nelson was in his Trafalgar campaign, now this is most unlikely. Therefore, mobility and surprise in landing operations are increasingly important. Air power has completely altered this problem. Not only must we possess command of the sea above and below water, but at least a partial command of the air, which is not easily gained at the opening of a war. In 1914, we landed our army at Havre and elsewhere with impunity, the sea trip and the landing were carried out under peace conditions. But imagine such a landing had the Germans held command of the air; then peace conditions would rapidly have volatilized, for Havre would have been deluged with bombs, and possibly Southampton also.

The means of frustrating an air attack I mentioned in my last lecture, namely, direct protection by aircraft, and indirect protection by bombing vital centres in the enemy's country, and so compelling his aircraft to defend them. Both mean the establishment of A.A. defences and landing grounds with all their paraphernalia at the points, or ports, selected for disembarkation, in order to develop an air offensive before the army begins to land. This may be a comparatively simple problem in a friendly country, such as France in 1914, but suppose, at some future date, we have to land on a hostile shore, then it will be anything but simple. Not only will the enemy's aircraft be upon us in no time, but possibly tanks and armoured cars, and certainly lorry-carried artillery and

machine guns and innumerable motor car guerillas. Therefore, before the first flight of air defence and air attack troops land we must land an army to protect them from ground attack; but before we land this army it must be protected from air attack. Here is a tactical conundrum which in some ways resembles the old one of the hen and the egg.

19. Strategical Reconnaissance.

At the outset of a campaign the first requirement is to find the enemy in bulk, for when once his main forces have been discovered it is not difficult to deduce from them and a good map of the theatre of war his intentions. This is the first step towards uncovering his plan, and not until it is uncovered, at least in part, is it possible to modify our own plan. As modifications are bound to arise, this in itself demands that the initial plan be a flexible one.

In the past, problems of time and space could be worked out fairly accurately, because the distance the bulk of the troops advanced or retired was seldom more than twenty miles a day. Should the enemy be located a hundred miles off, it was known for certain that contact would not take place for at least five days, which meant five days wherein to prepare to meet him. To-day, on account of the enormous numbers of buses, cars, lorries, etc., to be found in all civilized countries, this period of time must be reduced by four fifths. I do not suggest that it will always, or even frequently, be possible to move a large force of men a hundred miles in a day; but the fact that it can be done will certainly be taken advantage of at the opening of a campaign. What does this mean from the point of view of strategical reconnaissance? It means two things:

(a) That the enemy's main forces must be located at the earliest possible moment.

(b) And that they are struck at, or threatened, at the

earliest possible moment, so that their advance may be slowed down and time gained.

It is obvious that the use of cavalry will prove exceptional in this work, for their mobility is not high enough, and their power of resistance is too low. It is equally obvious that aircraft is the superior arm in such operations, especially in locating the enemy, but in spite of their power to bomb marching and lorry columns, only in exceptional circumstances, such as a bombing attack on a defile, is their power of delaying an enemy's advance considerable. It would appear, therefore, that in warfare to-day the most effective delaying force is one composed of aircraft and motorized infantry and artillery supported by or working with tanks and armoured cars. The aircraft will not only locate the enemy but protect the motorized troops, whilst these and the mechanized ones carry out the delaying action. Obviously, in a friendly country such a force will be able to work at a great advantage, because the bulk of its supplies will be guaranteed; but on approaching the enemy it must be prepared, whether the country is friendly or not, to meet large numbers of motor car guerillas. These troops are likely to become as popular and annoying in another war, as did the Croats and Pandours, and free corps generally in the Seven Years' War. These irregular troops should be met by their like; for, as in the eighteenth century, it would seem a waste of military strength to employ highly trained and organised troops on this work.

In strategical reconnaissances air photography plays an important part. Photographs can be taken at great heights and can be rapidly developed in the field. As they do not lie they are invaluable in checking verbal reports sent in by the troops and culled from prisoners, local inhabitants, agents and spies.

Once contact is gained by aircraft it should never be lost, this is particularly important if the enemy possesses armoured forces. They must be found, watched and frequently reported upon; for as their mobility is

high, in a few hours they may shift their positions by many miles.

This necessity of contact and the dread of it being imposed will in all probability lead to considerable battles in the air immediately after war has been declared, and on the results of these battles will largely depend the ability to carry out efficient strategical reconnaissances. More and more does it appear, therefore, that on superiority in the air will the stability of a war plan depend.

20. Special Considerations in the Case of an Overseas Campaign.

As overseas campaigns are the sole ones in the category of wars of the first magnitude which face us, an examination of their difficulties is of considerable importance to us. In recent years these difficulties have so greatly increased, that the protective measures necessary have become complex in the extreme. Whilst in former times the one item in an army which complicated embarkation and disembarkation was the horse, which at a pinch could always swim ashore, to-day lorries, guns, tanks, tractors and aeroplanes, can only with the greatest difficulty be disembarked at a small port or on an open beach. The result of this is that the number of favourable landing places has been limited, for to-day a well-equipped port is essential if speed of disembarkation is of importance.

Besides this difficulty, which is a very formidable one, for even if surface command of the sea is absolute, this in no way guarantees security against submarine attack; consequently convoys of transports will have to be strongly escorted, and mainly by destroyers, a class of vessel which can be ill-spared by the fleet. Further, long before the convoy has reached the point selected for disembarkation, its approach is likely to be signalled by wireless, so that when it nears this locality it may

be met by an overwhelming force of aircraft, and strong forces of all arms rapidly assembled at the threatened point by motor transport. In fact, so great are the difficulties, that in wars of the first magnitude armies as at present equipped and organised will seldom be able to effect a successful landing in face of opposition.

At Gallipoli, though the opposition met with was not well organised or formidable, the landing was extremely costly. In the Russo-Japanese war, even though the initial Japanese landings were unopposed, had it not been for the fact that before the declaration of war preparations for them had been surreptitiously carried out, time sufficient for opposition to materialise in might possibly have been gained.

For a modern army, the port of disembarkation selected must not only be well equipped, but must possess in its immediate vicinity good landing ground for aircraft and ample space for base depots and stores. It should possess good forward road and rail communication, be easily defensible on its landward side and difficult to attack on its seaward. Even if several such points of disembarkation exist, their number will always be limited, and their very advantages will lead to the enemy placing them in a state of defence immediately war is declared.

Unopposed landings, except in wars of secondary importance, are, therefore, likely to become less and less frequent; consequently the problem of the opposed landing demands our attention. In such operations combined action of sea, land and air forces becomes necessary, and as the requirements of these forces are incompatible, friction between the three staffs is likely to occur, and to pacify all sides compromises leading to the adoption of half measures are apt to inoculate the entire operation with the germs of ruin. Here are a few of the more important problems:

The army looks for the safest and most convenient landing place from a tactical and strategical point of view. The navy from that of submarine and aircraft attack

and defence. The air force from that of suitable landing ground; for to operate in strength from aircraft carriers is out of the question, and the bulk of the machines used in war are not made to land upon water.

Turning to the main military difficulty: the weak link in all landing operations is the gap between ship and shore. To attempt to span this gap by means of open boats and lighters in face of machine gun opposition may be magnificent but it is scarcely war. To this problem *F.S.R.* offer us no solution, yet this is one of our most important problems in another war. This being so, I will place before you my own views for what they are worth. They are as follows:

I believe there is a solution to this problem, and though it is not one we are prepared for, this makes it all the more necessary for us to consider it and think it out. If the link between ship and shore can be safely spanned, rapidly spanned, and spanned in sufficient force, the main difficulty will be overcome, because the point selected, in spite of it being an obvious one, may be surprised, and surprise in such operations is essential. For this operation I suggest a self-propelled vessel, not exactly a tank, but a hybrid between a tank and a boat, that is to say a vessel which can propel itself through the water and move on land. Such a machine would look, I expect, like a small tracked submarine, and though on land it is not likely to be as mobile as a tank, or in water as handy as a motor boat, if it can solve this problem it is worth considering, and I suggest that it might with advantage be manned by the Royal Marines.

A considerable number of tanks of this description could be carried in a vessel of the size of an aircraft carrier, and a landing having been decided upon, one or more of these ships, accompanied by a small escort, would have a far better chance of effecting a surprise than is possible with a large force such as an infantry division. Should the landing prove successful, the next forces to be landed would be A.A. defence units, and

possibly a specially organised armoured force under cover of which the main landing could be effected.

Outside the expense of designing and building a small number of amphibian tanks, there is nothing to prevent us solving this problem. We realise full well the impossibility of advancing on land against machine gun fire unless the attacking forces are strongly supported by artillery and tanks, and we know also the cost of frontal attacks. Now practically every landing operation must be a frontal attack. As it would be carried out to-day it cannot be supported by tanks, and ships' guns are poor substitutes for field guns. We are not allowed to support it by gas attacks, and men in boats and lighters are not men in fighting formations. How then are we going to overcome the enemy's machine guns in such operations. This is the crucial tactical problem in opposed landings, even if opposition is weak, and if we are not fully prepared to overcome these weapons, we may be perfectly certain that they will overcome us. To publish text-books and instructions concerning landing operations without solving the ship to shore problem, may well be compared to issuing rules and regulations as regards fires, and fail to establish a fire brigade.

LECTURE IV.

CHAPTER IV. BATTLE.

21. General.

Battle is the accomplishment of strategy, and the object of strategy is to compel an enemy to relinquish the war and recommence political argument under conditions far less favourable to him than those which existed before war was declared. For example, in 1914 political argument was replaced by war; in 1918, the armistice of November 11 terminated the war and argument was reassumed and clinched at Versailles the following year.

Modern wars differ from ancient ones in that their termination is far less drastic. In former times whole countries were annexed; this is no longer possible or desirable, for the origins of modern wars are in nature economic, and as trade to a large extent is international, to destroy an enemy's power to work or to annex his country cannot lead to the establishment of a more favourable condition of peace than that which existed before the outbreak of war; consequently, destruction or annexation are no longer legitimate objects of grand strategy.

Strategy is accomplished by battle, but grand strategy is not concerned only with the application of military force, but with many other national activities, such as economic pressure, financial disorganisation, propaganda to lower the prestige of the enemy in the opinion of neutral countries; all of which it employs to break down the will of the enemy nation.

The advance to the battlefield is a strategical act, in which tactics begin to shape themselves directly

contact is gained. Battle itself is an extremely complex act which may be divided into three stages, namely, the approach, the deployment and the attack. The first is normally carried out under the protection of advanced guards, and the aim of the second is to seize and occupy certain positions which will lead to a clinch between the opposing forces, and which will allow of a favourable chance to manoeuvre once this clinch takes place. These operations of holding and hitting will be considerably strengthened, if whilst the clinch is in progress a distracting operation is set on foot; that is a movement towards a point not selected for the decisive attack, but sufficiently threatening to compel the enemy to take serious notice of it. Such an operation will in most cases force him to draw upon his reserves, and so distract his attention from the point where the main blow is intended to fall, and consequently lead him at an early stage in the battle to alter his plan. Alterations in plan are the foundations of demoralisation, the attack on the nerves of the enemy's command; for doubt in a commander's mind is highly contagious, and is apt rapidly to infect the morale of his subordinate leaders. To create an atmosphere of doubt is the first step towards creating a situation for surprise.

The next act, which, may be called the act of stabilisation, should aim at exhausting the enemy's reserves, by compelling him to attack at a point distant from that selected for the decisive attack. Napoleon once said: "I attack to be attacked"; what he meant was that he advanced a fraction of his army to attack the enemy so that the enemy would in turn attack it. He then gradually reinforced this fraction, drawing more and more of the enemy's men into battle, and when he had forced the enemy to throw in the bulk of his reserves, the decisive attack was launched in quite another quarter. Though, because of the error of Marshal Ney, the Battle of Ligny (1815) did not end in an overwhelming victory, this battle is a wonderful example of these tactics.

Stabilisation is not normally gained by throwing an enemy on the defensive or by assuming a defensive attitude, unless both these actions compel him to deplete his reserves and so reduce his power to manoeuvre; but by attack, the object of which is to pin down the bulk of his troops—not necessarily overwhelm them. Once this has been accomplished, the last act of the battle takes place, namely, the act of disruption, that is the decisive attack, the aim of which is by surprise, or concentration of force, to overwhelm the enemy at a point which when captured will threaten the security of his entire army, and which on account of the clinch he is unable to reinforce.

In brief, the art of giving battle consists in:

(a) Immobilizing the will of the enemy's command by distracting his attention from what you really intend to do.

(b) Immobilizing the enemy's strength by compelling him to exhaust his reserves.

(c) Mobilizing your reserves and hitting him at a point he can no longer reinforce.

From this it will be seen that in the word " reserves " lies hidden away from the common gaze the secret of victory or defeat.

Though frontal attacks are no longer profitable as decisive attacks, there is no reason why they should not be made extremely profitable as holding operations. Should A and B face C and D, and should A attack C in order to compel D to come to his assistance, then if A hangs on like grim death to C and D, all B has got to do is to slip round one of their flanks and hit C and D on the back of their heads. Such is in fact the secret of successful battle.

Finally, as regards the pursuit. Properly speaking this act, which may be called the act of annihilation, is a new battle. If the troops who are already exhausted by fighting are called upon to pursue, pursuit will take place under most disadvantageous circumstances, because

a man flying to save his life usually puts up a better pace than he who even in hot pursuit is attempting to take it. The instinct of self-preservation is a mighty stimulant, consequently a fresh force is normally required, and if possible a highly mobile force—in the old days cavalry, and to-day armoured troops. In the pursuit the object should be not so much to press the enemy's rear, except to compel him to reinforce his rearguards, as to head off his retreat by a rapid parallel movement. One of the best examples of this is Grant's pursuit of Lee in the final campaign of the American Civil War.

22. The Forward Movement from the Area of Concentration.

Once the forward movement takes place, and when the enemy's intentions may still be in doubt, the first step is to seize such geographical features as are likely to become strategical and tactical pivots—approaches in the one case and defensive and offensive localities in the other. This will most certainly be done by motorized troops at the very outset of the war. To-day in France, it is possible within a few hours of war being declared to move by motor transport to any point on the frontier at least one thousand field guns and several thousand machine gunners. To occupy and seize the main lines of approach in an enemy's country is all-important, not only to gain and restrict mobility, but because these lines normally run through highly populated areas, and consequently their occupation adversely affects the enemy's resources.

This forward movement of motorized and mechanized troops will undoubtedly compel an early deployment in order to cover or to turn the advancing enemy's lines of approach. This brings us to the question of march formations, a question not fully dealt with in *F.S.R.*

All march formations are in column, of which there are two kinds—single columns and multiple columns.

For a force of any size, the disadvantage of the single column is obvious. It gives the enemy a single objective to watch and to strike at; it forms an ideal air attack target; it is difficult to supply; it can never change direction rapidly, and the time taken in deploying it is in direct proportion to its length. Multiple column formations are far more flexible, of these there are three kinds (see diagram 1).

(a) Parallel columns—fig. 1.

(b) Columns in echelon—figs. 2 and 3.

(c) And columns in square—fig. 4.

The main disadvantage of the first is that it cannot readily change direction to a flank. The second overcomes this, whether moving in echelon by a flank or in arrow-head formation. In the diagram it will be seen, that if an enemy appears at A or B a flank wheel will become necessary, and in fig. 1, this wheel is a cumbersome operation, whilst in figs. 2 and 3, it is simpler. In an echelon formation the distance between columns should, if the roads permit, be approximately half their length. Thus, if columns w, x, y, and z are each 12 miles long, the distance between them should be at least 6 miles; this in a turning movement will mitigate delays.

The square formation, fig. 4, is the famous lozenge formation frequently made use of by Napoleon. One of the clearest examples of it is to be found in his Jena campaign. In it y is the advanced guard, and w, x and z the main body; but should the enemy appear at either A, B or C, respectively x, z and w will take over the advanced guard duties. This formation requires that each column is a column of all arms, so that it can develop strong delaying power until the other columns come to its support.

In present day fighting, when on account of motorized and mechanized forces, an all round defence is so necessary, it would appear that the arrow-head and

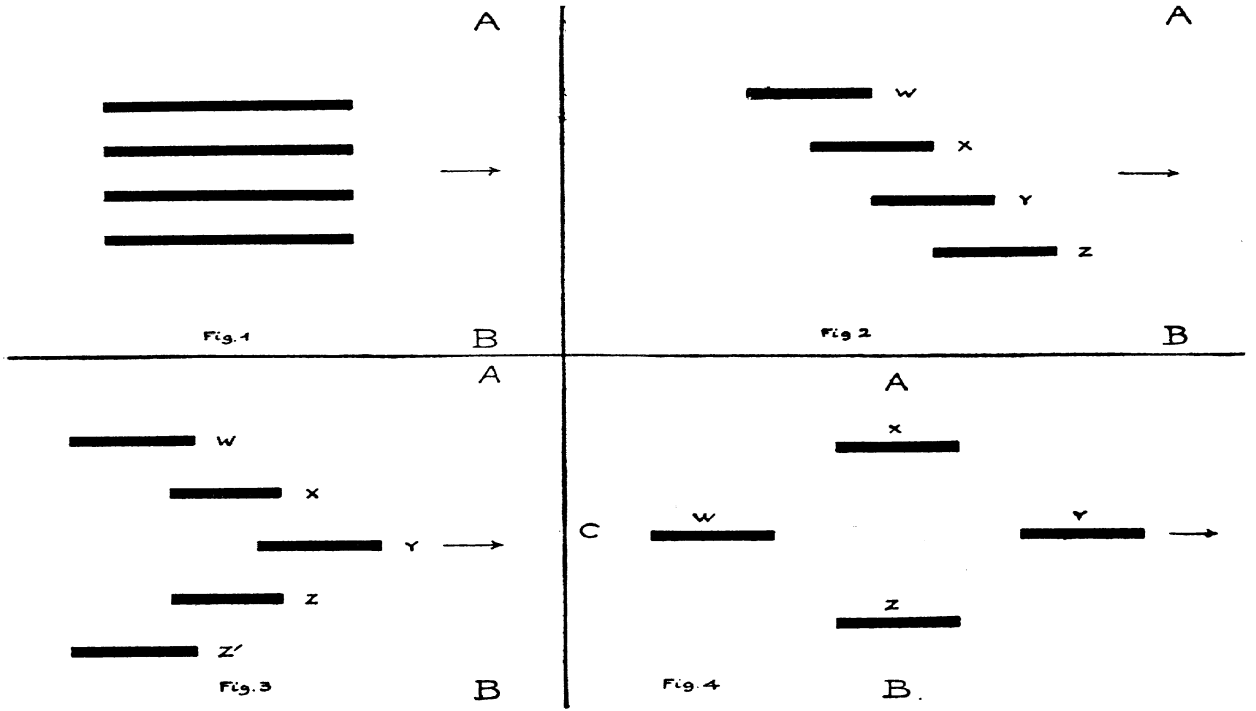

Diagram 1. *Column Formations.*

square formations are those which are likely to prove the more useful, as they enable the transport etc., to march, not as they have hitherto done in rear of the fighting troops, but within their logistical distribution.

Until recently strategy has been entirely woven on the system of roads and railways to be found in the theatre of war, but on account of the increasing value of tracked and multiple-wheeled vehicles, open spaces must also be added to these, though it should not be overlooked that these spaces generally possess the disadvantage of being more open than roads to air observation.

Generally speaking, an advance on a broad front is best, as width of front not only renders hostile turning movements more difficult, but it allows of more room for each separate column to change direction in. Besides this, the shorter the column the more rapid the advance. For example : a single man, or a small party of men, can easily march at the rate of four miles an hour, a brigade at three, but a complete infantry division will seldom attain a higher rate than two. Though the *F.S.R.* are against the splitting up of the infantry division into brigade groups of all arms, this temporary arrangement of force is, in another war, likely to become the rule rather than the exception, because even if the enemy possesses few mechanized troops, his armoured cars will always seek to attack unprotected transport. Consequently, unless strong escorts are allotted to the supply columns etc., they will have to march within the logistical formation and not behind it. This means that the division will have to march in an arrow-head or square formation, in which case, unless each column is composed of all arms it will not be in a position to meet armoured or motor car attack. The influence of the motor car guerilla upon the tactical composition of marching columns appears to me to have been overlooked in *F.S.R.*

A point which however is accentuated is the influence of aircraft on secrecy. A marching column is easily visible

from the air, and often presents a favourable target. Night marches are recommended, but rightly only as occasional movement, for they are in every way unnatural operations; the hours of night are hours to rest in and not to work in. The night movement of small motorized and mechanized troops, is, if efficient day reconnaissance has been carried out, not a very difficult operation, for in a normally well roaded country they can easily be moved 20 miles in three to four hours.

23. The Approach March.

As the enemy is neared it may become necessary to close in the advancing columns; if separated, each will be preceded by an advanced guard of its own, or if close together a general advanced guard may be used. This type of guard which was included in former editions of *F.S.R.* has in name been dropped in the present edition, to reappear as "a force of mobile troops and aircraft to operate in front or on the flanks of the advancing army." The main advantage of such a force is that being powerful in armoured troops it can rapidly sweep away all unarmoured opposition.

The order of march must be the order of battle, that is the order in which troops are likely to be required. Unless the country is very enclosed, artillery should be well forward in the column, especially howitzer batteries. The best local protection for artillery is undoubtedly the tank, for it can attack all forms of armoured troops as well as infantry. Some tanks should, therefore, be allotted to the advanced guard, as well as engineers and bridging equipment if rivers are to be crossed.

An important point, which is apt to be overlooked, is the protection of the administrative units and supply columns—the impedimenta of the army. Remembering that the front of an army no longer so completely protects its rear as formerly, for the enemy's armed motor cars

will be as ubiquitous as the old Parthian cavalry, they must march inside a strong rearguard or else be escorted. This also applies to A.A. defence, and here the problem of protection is most difficult, for A.A. guns generally will have to take up positions well on the flanks of the line of march. To move with the marching columns is not feasible if they are to carry out their duties efficiently. Here it would again appear that the square formation is the best, for then these weapons can be placed within the square where they need not be disturbed for several hours at a time.

The position of tanks is another problem. If roads or tracks permit, their best position is on the flanks of a column; if not, then in rear of the unit or formation they are supporting. As they can travel along a road at the average rate of ten to twelve miles an hour this is no great disadvantage.

24. The First Contact with the Enemy.

From the very first contact with the enemy a commander should attempt to impose his will upon him. Fear is failure and the forerunner of failure, and if from the opening of a war you can make your enemy think more of what you are going to do to him than of what he is going to do to you, you will gain moral ascendency over him. To do this, the initial blow must be a strong if not a staggering blow, aimed at unmasking his intentions and distracting his plan. In such blows the employment of armoured forces supported by armed motor car guerillas will prove of the utmost value. In the nursery a child will often keep the sugaring on its cake to eat last, but in war the pleasing prospect of keeping tanks up one's sleeve, like the deringer of the old fashioned gambler, until some presupposed decisive hour begins to strike may not be found such a pleasure after all. When some years ago now Carpentier knocked out Beckett, this did not happen in the third or sixth rounds, it happened

within a minute or so of these two champions entering the ring; in fact it happened so suddenly that many of the spectators never knew what had taken place until they were told. Such rapidity of decision is undoubtedly the exception in the ring and in war, but an exception which is likely to grow less frequent when tanks are used with audacity.

25. The Plan of Battle.

Once contact is gained a commander can attack, await attack, manoeuvre or withdraw. Which he does will depend largely upon circumstances, consequently his initial plan must be sufficiently flexible to withstand the stresses and strain of any one of these operations. To base it, say, on the fixed idea of attacking, as the French did in 1914, is to reduce the art of war to military roulette. Gamblers sometimes accomplish great things, but it is only through the luck of the Devil, and Satan is not a reliable partner.

Generally speaking, a commander must attack, because without attacking he can neither hit nor hold, and seldom can he manoeuvre ; but in any one of these cases he need not necessarily attack *au fond.* To await an enemy without attacking is frequently futile, and to attempt to manoeuvre without first doing so is often to risk annihilation.

The tactical forms of attack are of importance, and as these are not dealt with in *F.S.R.* I will examine them in some detail (see diagram 2).

(a) *Parallel Order* (Fig. 1 and 2). The simplest form of attack is in parallel order which presupposes a frontal attack. It is, consequently, unsuited for present day warfare. A modification of this order is obtained when the front of the attacker extends beyond his enemy's flanks, when an

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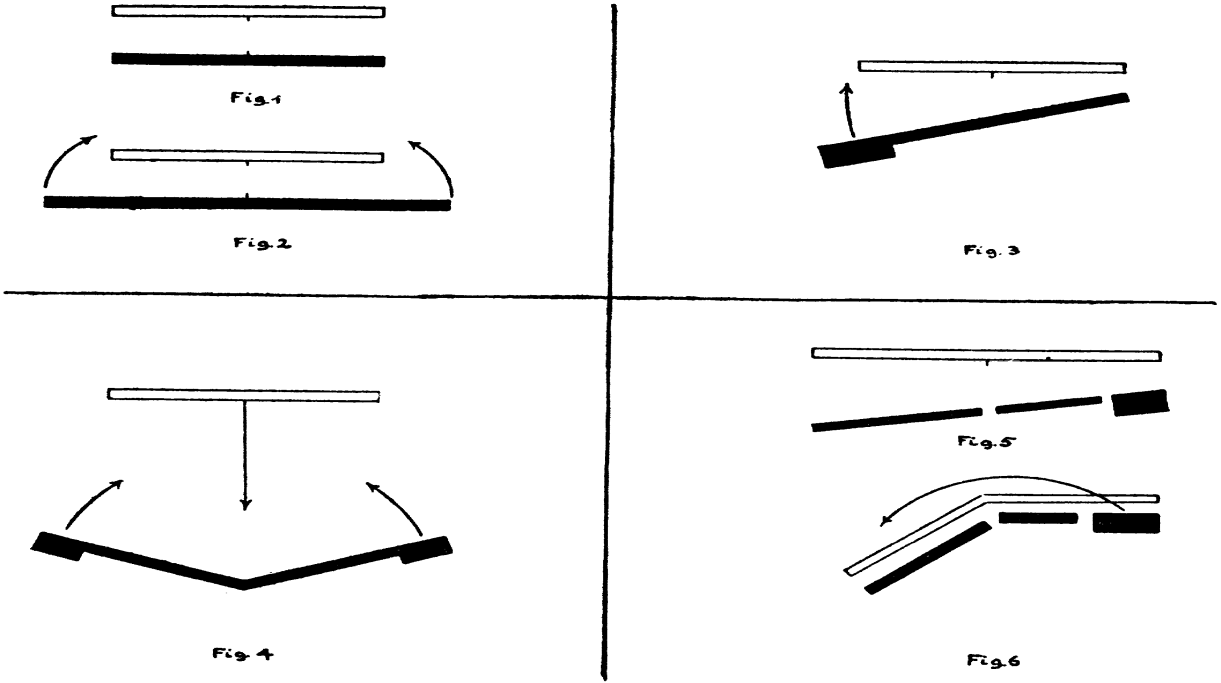

Diagram 2. Tactical Forms of Attack.

overlapping operation is possible. Unless the overlapping portions are highly mobile (see below Double Oblique Order), under modern conditions the chances are that the enemy will slip away before the double envelopment becomes effective.

(b) *Oblique Order* (Fig. 3). The oblique order of attack, as far as we know, was initiated by Epaminondas at the battle of Leuctra in 371 B.C., and in the eighteenth century it was made much use of by Frederick the Great. It consists in drawing up an army obliquely to the enemy's front, of threatening him along his whole front and so stabilizing him, and then with a stronger flank strike at his weaker flank.

(c) *Double Oblique Order* (Fig. 4). The double oblique order was somewhat similar. At the battle of Cannae (216 B.C.) one of its most famous examples, Hannibal drew up his army in this order, and let the Romans drive in his centre. Then clinching inwards he enveloped their two flanks and destroyed them almost to a man. In this example it is generally overlooked that the Romans were induced to get thoroughly well involved in the fight before the decisive outflanking attacks took place. Under modern conditions of fire power unless an enemy is well involved he may disengage and slip away.

(d) *The Rear Order* (Figs. 5 and 6). One of the most cunning forms of the oblique order was used by Alexander the Great at the battle of Arbela, in 331 B.C., and it could with ease have been applied by the German higher command in 1914. Alexander advanced in an oblique order with a strong centre, a weak left and a superlatively strong right. The centre acted as a pivot, and when the left wing was driven back enticing the

Persians to follow, the right wing swung round and took the Persian right wing in rear.

(e) *The Converging Order.* This order demands two armies, one to engage the enemy and hold him whilst the other falls upon one of his flanks or rear. There are many examples of this form of attack, notably the battles of Waterloo, 1815, Sadowa, 1866, and of Tannenberg, 1914. It is an admirable order of attack, but is easily put out of joint if the outflanking army is delayed in its advance.

To assume the offensive simply for the sake of attacking is a poor argument, and on certain battlefields, as happened at Austerlitz (1805) and Salamanca (1812), what is known as the offensive defensive may lead to the gaining of an overwhelming victory. Should the defensive nature of the ground be in your favour, it is frequently advantageous to let the enemy attack and use up his reserves, and then to counter-attack him in flank or rear. The time to change over from the defensive to the offensive is when the enemy is thoroughly involved and approaching exhaustion.

What I have now said will I hope show clearly, that there is no single road to victory. The method of waging each battle depends on circumstances. The danger to-day of purely defensive positions is the increasing power of manoeuvre by motorized and mechanized troops. Once conditions have been weighed, the order of attack must be decided upon, and the plan of battle elaborated. This plan should be simple, and if the order adopted enables you to hold, manoeuvre and hit, you will not go far wrong. To hold strength and hit at weakness. To pin the enemy's front down and hit him in rear, or flank, when he least expects it, and with a force superior to the one you are likely to meet, and to place the reserves in position with reference to these two ideas.

26. Deployment for Battle.

If the advance is made on a broad front, deployment is generally easy, if on a narrow—then difficult. In deploying, the rear should never be uncovered, because the rear services are vital to the maintenance of the fighting troops, and the shifting of them from one position to another in search of security is by no means an easy job. In proximity to the enemy, deployments are always dangerous. In 1914, the British Army was too far forward when its deployment took place, with the result that though it put up a stout resistance, its commander to a great extent lost control of it, which caused a good deal of suffering and friction during the retreat. Deployments at night are always difficult, and require minute preparation as regards timings, routes, positions of assembly, and starting points.

27. Organisation in Rear.

The protection of the vast organisations in rear of a modern army is an even more important problem than that of the fighting troops in front; for whilst these can protect themselves, the rear services cannot, and their discipline being less steadfast, they are apt to be thrown into panic at slight provocation. The most certain way to protect them is to be successful in front, that is to push on; for not only does a sustained advance lengthen the distance between the enemy and one's rear organisation, but it compels him to concentrate his attention on our fighting troops, and so distracts his attention from the services in rear of them.

28. Positions of Commanders.

Throughout a battle, the position of the headquarters is an important consideration. During contact and deployment, force headquarters should be well forward, so that a commander can rapidly modify his plan. He should not hesitate to take control of an advanced guard

operation by deciding what should be done, but once he has made such a decision he should leave it to its commander to carry on.

Once contact is gained and the battle is beginning to develop, he should retire from the immediate vicinity of the front so as to obtain a more general view, and establish his headquarters near a good centre of communications, and as close as possible to his reserves. From there he can keep in constant touch by means of his liaison officers, who should be saturated with his ideas and should personally know the characteristics of the commanders they are told off to visit.

Subordinate headquarters should be as far forward as conditions permit, and should when possible be grouped. For example a division in the attack has a divisional headquarters, an artillery headquarters, a R.E. headquarters, etc.; these should be in the vicinity of each other, and well hidden from air observance. It is amazing, even in peace training, how extensive a divisional headquarters will become; consequently it is advantageous to separate the actual thinking portion from the administrative portion, in order to secure the general and his operation's staff from constant interferences, especially from aircraft. For a divisional headquarters to move its position more than once in twenty-four hours will put a tremendous strain upon the signal service.

LECTURE V.

CHAPTER V. INFORMATION.

29. Information—General Principles.

From the theory of war as outlined in the preceding two chapters, in this one we turn to its practice. The first thing is to find the enemy. In great wars the main lines of approach are generally known beforehand. Thus, in the last war, the number of lines of advance from Germany into France were some half dozen in number, and the only doubtful point was which would the main forces take. This could have been discovered even by the aircraft of that period, but aeroplanes being in their infancy, they seem to have been overlooked. To-day, it is scarcely believable that for a week General Joffre doubted the fact that a strong German advance was taking place through Belgium, and this in spite of Liège having fallen and the whole of the Belgian army having retired westwards. A little later on, a single aeroplane reported to General Galliéni, then commanding the troops in Paris, that the Geman right wing was moving east of the city, and being a man of intelligence, he at once set on foot those operations which led up to the battle of the Marne. The point to note here is that finding an enemy is of no greater worth than picking up a nugget of gold, unless the finder realizes the value of the thing found ; for the chances are that such information will be thrown aside. To realize, means much more than hearing, seeing or reading; it means placing the thing heard, seen, or read about, in a strategical setting which will of itself show what it is worth. Knowledge of the art of war, especially as taught by the enemy's military school of

thought, knowledge of the theatre of war with reference to the enemy's strategical and tactical leanings, and above all knowledge of the enemy's higher command, constitute as it were a mental spectroscope which will at once disclose in its true colours the information received. The most accurate information obtainable is valueless, if, should the enemy be reported at A, and you happen to be at B, you are unable to appreciate, and with extreme rapidity, what this means in terms of strategy and tactics.

The whole subject of information may be divided under two headings, namely, gaining it and preventing the enemy from doing so. The organ of information is the entire army just as the human body is. There are special organs such as the eyes and ears, namely, the intelligence branch of the staff, spies, agents, etc.; but the troops themselves may be compared to the skin of an army, and all sensations they experience should be sent back to the brain to be valued. These sensations should not only refer to the actions of the enemy but also to the moral state of our own troops. This point is sometimes overlooked, with the result that a commander will plan an operation which at the moment his men cannot carry out. I have witnessed cases of badly demoralized troops, who, because they have not lost heavily, were ordered to do something not irrational but in the circumstances illogical. This lack of moral appreciation may often be traced to a subordinate commander fearing to report what he may rightly consider to be unsoldierlike behaviour. He seldom minds exaggerating physical loss due to the enemy's action, but he often minimizes moral loss, either because he cannot sense it, or because should he report it, it may be attributed to his lack of leadership. If a commander is unable to stand being told an unpleasant truth, then he is not fit to command; for truth quite as much as accuracy is an essential in imparting information.

Speed also must be equated with truth and accuracy. Information is like an electric battery which is apt in time

to run down, and often in a very little time. To be handed an accumulator which will not give off a spark is to be handed valueless junk; so also to receive information, when the circumstances in which it was gathered have vanished, is to receive mental junk—worse, for true and accurate information when out of date though meat to the historian is poison to the general staff.

There is yet another point, and in my opinion an important one. When possible, all tactical information should conclude with a judgment—a suggestion. Thus: "The enemy is at X, and it would appear that his intention is Y; therefore I suggest action Z." This does not mean that action Z is necessarily the right one for the superior officer to take. He may have received other information which throws a different light upon the situation; but if he has not, he will anyhow realise that here is a suggestion which a subordinate considers can be carried out, or that he can carry out.

Negative information is as important as positive, because by eliminating the vacant spaces the full ones are likely to become more apparent. To take an extreme example; if the enemy can only be in squares A, B. C and D, and if it is discovered that he is not in A, B and C, then he must be in D. A map may possess a thousand squares, yet negative reports from a hundred of them will reduce uncertainty by ten per cent.

In communicating information, remember that it can be sent in four directions, namely, to the front, to the rear and to the two flanks. If you are in front then there are only three directions, and two of these, namely, the two flanks, are in the hurry and skurry of battle often forgotten.

30. Reconnaissance—General Principles.

Reconnaissance may be defined as the art of finding, and conversely the art of not losing a thing once it is found. As in war, the thing looked for does not usually

want to be found, reconnaissance may be compared to hunting, not so much fox hunting as big game shooting, and above all big game photography; for to take moving pictures of wild life a man does more than stalk his "prey," for by degrees he learns to understand its secrets. Patience, quite as much as audacity, is an essential in efficient reconnaissance.

In war, finding an enemy, watching his movements, and from these estimating his future actions, are the foundations of correct strategical and tactical judgments. Consequently, it will be realised that finding an enemy also means appreciating the conditions in which he is found. The influence of the communications on his possible movements, of rivers, local supplies, offensive and defensive features, and so on. When, during the battle of Fort Donelson, General Grant learnt that the prisoners captured were carrying in their knapsacks five days' rations, he at once realised that he was not confronted by an attack to drive him back, but by an attack the aim of which was to evacuate the fort. This at once enabled him to make up his mind as to the correct measures to adopt.

The bulk of the information gathered up is poured into the intelligence branch of the general staff, where through a process of exclusion, condensation and verification, it is sorted out and valued.

The instruments of reconnaissance may be grouped under the headings of strategical and tactical. First the enemy is formed in bulk by aircraft, and secondly examined in bulk by armoured car patrols. Thirdly the cavalry come into contact with him, and fourthly the infantry report on the actions fought.

In all this work the reconnoitrers should be given a definite object, that is they should be told what to look for, though this does not prohibit them keeping their eyes wide open and reporting information generally. They should also be informed as to what their own troops are doing, otherwise regrettable incidents such as the stalking

of friendly in place of hostile detachments are sure to occur. I remember, during the South African War, two patrols of the Cork Militia being sent out one night from the railway junction of Wolvehoek. Not far from the station was a loop of line connected to the main track; but for some reason or other the railway authorities removed the connecting link. The first patrol struck the loop and could not find the line leading off it; the second did the same and did not know that there was a patrol already on the loop. A most extraordinary engagement now took place. The second patrol, hearing a noise in front of it, opened fire, whereupon the first patrol took to its legs and came up behind the second and hearing a noise opened fire in its turn. This circular action, afterwards known as the Battle of the Loop, or Col. —'s Circus, ended by one patrol running out of ammunition and surrendering to the other. The battle, which left both sides in a state of exhaustion, was entirely bloodless, for no one was hit.

31. Reconnaissance from the Air before Battle.

Air reconnaissance falls into three groups—distant, medium and close. The first resembles the work carried out by the old independent cavalry, and the second and third by the present day protective cavalry. Close reconnaissance is carried up to 15 or 20 miles of the front or flanks, medium from 15 to 30, and distant may penetrate as far as the radius of aircraft allows. Though there is bound to be a certain overlapping in this work, there should be no confusion of duties. These are, for distant reconnaissance, the rear of the enemy; for medium, the extent of his front and the position of his flanks; and for close, (the duty of the army co-operation squadrons working with corps or divisions), our own and the enemy's forward dispositions.

In the first, co-operation between the air patrols and armoured cars and armed motor cars is of importance,

and in the second close touch with the cavalry and the A.A. defence.

32. Reconnaissance from the Ground before Battle.

Again, definite instructions are essential, and especially for cavalry, because unnecessary work exhausts their horses far more rapidly than a machine, such as an aeroplane or armoured car. Napoleon's instructions to his mounted troops were always precise and clear—" You will proceed to A and report whether it is or is not in occupation of the enemy; if not occupied, you will proceed to B, and if found unheld will secure the bridge at this place and send in your report with the utmost speed." In this form were given most of his cavalry instructions.

The primary object of a cavalry reconnaissance is not fighting but discovering. When discovering requires uncovering, as I have already mentioned in an earlier lecture, in place of increasing the size of a cavalry force it is better to add mechanized guns and motorized infantry to it . Yet it will, so I think, prove the exception rather than the rule to combine armoured and cavalry forces, for their degrees of mobility are so very different. Generally speaking, when uncovering becomes necessary, armoured cars will be of great value, and in a friendly country the armed motor car is likely to play an important part in maintaining contact, and it is only when a firm contact is gained that fighting for information becomes necessary.

One of the great advantages, especially in a friendly country, is the power mechanical vehicles possess to disperse and to concentrate. Armoured cars can move out on a wide front, can rapidly concentrate at selected points, and withdraw from them on a wide front. It is true that cavalry can split and squander at will, but individually the trooper possesses little fighting power, and if faced by the motor car guerilla even a squadron is often likely to be taken at a disadvantage; whilst an

armoured car being bullet-proof has far less to fear. In my opinion, it is not mechanization but motorization which eventually will banish cavalry from all forward military operations.

I now come to an interesting sentence—"Time spent in reconnaissance is rarely wasted." It is interesting because it has been turned into a catch phrase, and this is apt to obscure its truth. In an argument it is an excellent precept to come to the point, but as the Americans say: "Come to the point, but don't camp on it." So also with reconnaissance; it is seldom wasted if rapid, but if slow the opportunity arising out of it is often lost. Reconnaissance is a means and not an end, extreme caution is as great a vice as extreme recklessness; for delay in movement is a frequent cause of defeat. In the attack, in June 1864, on the City of Petersburg, held by only 1,200 Confederates, General Smith carried out a meticulous reconnaissance lasting seven hours, at length he attacked and was defeated by the approach of night. Had he instead spent one hour in reconnoitering, there can be little doubt that the city would have been his, and that the Civil War would have been shortened by six months.

33. Reconnaissance during Battle.

If the plan is clear and simple, reconnaissance will follow automatically; if full of alternatives and suppositions, it will not. Simplicity and not complexity leads to the anticipation of probable events. Thus, in May, 1864, General Grant laid down as his objective the pinning down of Lee's army, whether he could destroy it he did not know, so this idea did not worry him. He foresaw, however, that Lee might fall back on Richmond, consequently before he opened his campaign he was prepared to cross the James river. Had he not done so, that is had he not made this mental reconnaissance, his campaign would probably have proved a failure.

Foresight in plan means foresight in reconnaissance,

and foresight in reconnaissance means economy of force. Every plan should, therefore, be analysed by the staff from the point of view of what may happen, and the reconnaissances required if it does or does not happen.

During battle, a commander modifies his plan on the information he receives concerning the enemy and his troops. In former days, generals, like Napoleon at Ligny and Wellington at Waterloo, could watch the greater part of their battle fronts, and consequently could judge things for themselves. Now others have to see for the commander, and unless they have been trained to see eye to eye with him, he will not see eye to eye with the situation. The simpler the plan and the clearer its controlling idea the easier will this focus of sight become.

The most important enemy units to watch are his reserves and his armoured forces. The first because they constitute his capital, and the second because of their power to destroy and demoralise unarmoured troops. Aircraft, once they have discovered the enemy's tanks, should not only signal their discovery, but also the direction these machines are moving in, and, when possible, what would seem to be their intention.

On the battlefield, now that the motor car and motor bicycle enable considerable distances to be covered in a few minutes, there can be no doubt whatever that liaison officers and officer patrols will prove of the utmost value. They establish a personal touch which no wireless communication can give, and which even the field telephone fails to supply, for a quick and intelligent officer at a glance can take in a situation which will occupy minutes to explain over the line.

34. Information from Prisoners, etc., and from Captured Documents.

A fact which should be recognised in war, and one not to be found in any manual is, that probably seven out of eight private soldiers captured will at once divulge

to the enemy all they know. With captured officers it is different, for it is the exception and not the rule that they give information away. In our own army, however, the private soldier is generally so ignorant and so badly informed that he seldom can disclose much of value. Twelve hours before the battle of Cambrai was launched, in November 1917, some of our men in a front line trench were captured, and forthwith informed the Germans that a number of tanks had assembled in Havrincourt wood. Fortunately this information arrived too late to be of any value; but it shows, regrettable though it may be, that the private soldier cannot be trusted with information of importance.

As regards documents, appreciations, suggested operations, and above all operation orders, these should be issued to the minimum number of people. It will be remembered how one of General Lee's orders, wrapped round three cigars, was found by a Federal soldier. It was sent to General McClellan and was the cause of his pushing on and fighting the battle of Antietam. In the final campaign of the Civil War, it is said, on what authority I do not know, that Lee's last order was picked out of a Richmond waste-paper basket by one of Grant's men.

35. Secrecy Regarding Information.

Over caution and concealment is apt to give an operation away, especially if it embraces a number of units and services. When, during the war, I was serving on the staff of the Tank Corps, the question of secrecy was a daily one, and it was successfully solved as follows: When an operation was about to take place, all those concerned, as well as all those who might come within its radius—the staff and heads of services, clerks, orderlies and even mess waiters, were assembled and informed that something of great importance was on foot, and if they obtained any inkling of its nature they were to keep it to themselves. After this system was adopted, I never

once remember any leakage of information. A man placed on his honour is endowed with a sense of responsibility begotten of trust; if not, he will often, through wishing to appear wise, show his superior knowledge by picking up things not intended for his ear and then retail them to his favourite gossips. During the war more secrets were thus revealed in the London drawing-rooms than were ever collected from the battlefields.

LECTURE VI.

CHAPTER VI. PROTECTION.

36. General Principles.

Protection is the foundation of all action, offensive and defensive. Its three most important forms are the protection of the plan, which may be called intellectual protection, and then physical and moral protection. The means of gaining the first are secrecy and deception, such as the broadcasting of false movements and operations; the second—ground, armour, extensions, guards and fire-power; and the third—confidence, discipline, interior economy, rest, sound leadership and the avoidance of unnecessary losses. In a carefully trained army, one arm protects another, hence the importance of co-operation.

In this chapter protection is examined under two main headings, namely, protection on the move and protection when at rest, and in this lecture I intend to deal with the former only. Both are complicated by the high mobility of the newer arms, for even at a considerable distance from an enemy, whether on the move or at rest, a force may be attacked not only by aircraft, but by armoured cars and armed motor cars. To send these forward even without any intention of attacking, will generally alarm the civil population which in turn will alarm the government and army command.

In an enemy's country, the danger of constant alarm caused by motorized guerillas will become a certainty. I have mentioned this fact several times already and purposely so, because it is a point not dealt with in *F.S.R.* It is inconceivable, now that civilized countries are looking forward to the day when one man one car

will become a possibility in peace time, that this enormous mass of cars is not going to be made full use of in war. Of itself, this danger of the motor guerilla attack which means incessant sharpshooting, will make it essential that every unit however small looks to its one local protection. No wagon line or store house can be left unguarded.

PROTECTION WHEN ON THE MOVE.

37. Mobile Forces.

The changing of old names and expressions is apt to confuse the military student, especially in his study of military history. The term "general advanced guard" is a well known one and clearly expresses the function and purpose it is intended for, why then, in the present volume of *F.S.R.*, "mobile forces" is substituted for it I cannot understand, for such an appellation does not express the protective idea.

When such a force is used, which in continental armies is almost certain to be the case on the outbreak of war, it will rapidly be pushed forward to protect important strategical and tactical features. In this case it is likely to consist largely of motorized troops, as I have in a past lecture explained. Behind it, and co-operating with it, may move one or more armoured formations which, manoeuvring between the pivots held will not only protect them from armoured attack, but will so threaten an enemy's advance that he will be compelled to act with great caution. This, it may well be hoped, will lead to a sufficient gaining of time wherein to complete mobilization. To suppose that both sides are going to declare war, and then do nothing until their respective mobilizations are completed, is to suppose that both sides are commanded by Rip van Winkles. Even in the last war, Liège was attacked by the Germans within a few hours of the declaration of war, and very little motor transport was in use at this date.

In my opinion, at the outset of a war, the main use of armoured forces is, by creating uncertainty in the mind of the enemy's command, to protect the plan and facilitate its application rather than protect the troops in rear of them. On the march, these troops are protected by aircraft, advanced, rear and flank guards, and more and more is it becoming necessary to make use of these forces in order to gain and maintain all round protection. An umbrella overhead may have been good enough for the old-fashioned shower, but a sou'wester and an oilskin and gum boots are far more certain to keep one dry in a modern (military) storm.

ADVANCED GUARDS.

38. Strength and Composition of an Advanced Guard.

If a general advanced guard is used, the advanced guards in rear of it are no more than protective organizations, shields against such projectiles which may fly over its head. If not, then they are offensive formations which gain protection quite as much by thrusting as by shielding. In such cases an advanced guard must be composed of all arms, including tanks; for if the enemy is armed with these weapons an advanced guard commander will lose confidence unless supported by them, and if the enemy is not, then he in his turn will lose confidence by being faced with them.

In open country an advanced guard should be as mobile as possible, and in this case there is no reason to suppose that the fullest use will not be made of motor transport, more especially so if the army is in possession of sufficient tanks and armoured cars to detail strong units of these arms for advanced guard work. For seizing centres of communication and tactical positions these weapons should prove invaluable, and if supported by

motorized artillery and infantry they can be relieved from holding them. There is no question that normally they cannot hold them if required to do so, for a tank does not hold, for example, a small hill, by sitting on the top of it like a statue upon its pedestal, but by prowling round it, like a watch-dog turned loose at night.

Some cavalry should always be allotted to an advanced guard, for in the work of searching, and collecting local information mounted men are most useful.

We are told that advanced guard mobile troops should move by bounds " from tactical feature to tactical feature." What is exactly meant by a tactical feature? I think the best answer is: An area of ground well suited to the weapon to be used in it, or an area in which mobility can be fostered or delayed. It is not necessarily an obstacle or point of observation. Thus, if tanks are used by either side, open ground becomes a good tactical feature for these weapons, and broken ground an indifferent one.

39. Advanced Guard Commander.

The position of the advanced guard commander should be well forward. A good general place is with the main guard. Before contact takes place it will normally be as well for the force commander to accompany the advanced guard commander, so that he may advise him as to what to do directly contact is established, as mentioned in a former lecture.

40. Action of an Advanced Guard.

Before an advanced guard moves off, its commander should by the aid of his map work out a series of bounds to be carried out by the troops most suited to the nature of the country within each bound. For example: In Diagram No. 3, the area to be traversed can be divided up into four bounds: A stretch of forest land, an open

plain, a river crossing and a mountain defile. In the first it is useless using tanks, obviously it is an infantry operation to clear the forest should it be found to be held. In the second, why exhaust infantry if a company of tanks can make good the plain. In the third, engineers may be required, therefore bring them forward, and in the fourth, if the enemy holds the defile, artillery will

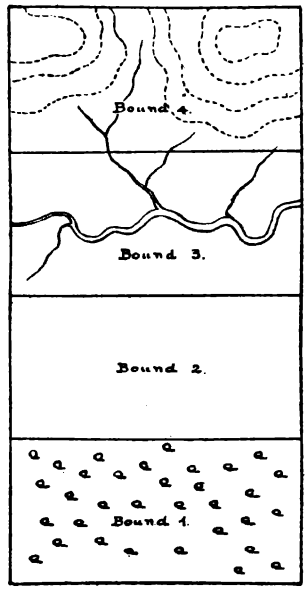

Diagram 3. *Bounds.*

most certainly be needed, consequently the guns should be well forward when the defile is approached. Working by bounds does not mean moving from line to line, but working over the areas between lines drawn on the map, and with weapons best suited to effect each bound economically. Examine each area before starting off, and make certain in your mind what troops will prove best to clear each should it be held.

41. An advanced guard in retreat.

An advanced guard to a force retreating is like a snow-plough which clears the way. In former times it was not necessary to make it a strong force, but to-day, because mechanical transport can move forward rapidly, it must not be overlooked that in a pursuit an attempt will generally be made to head off a retiring force by pushing motorized and mechanized troops round its flanks; and that at times some of these may be able to take up a position blocking the retreat. When the British Army fell back from Mons in 1914, had the Germans been able to push round its western flank a considerable force in lorries protected by armoured cars, it is not inconceivable that we should never have been able to cross south of the Marne river, and would probably have capitulated on its northern bank.

42. Protection when deployed.

When the main body is deployed, it, so to speak, becomes its own advanced guard, and is consequently responsible for its own protection. To compel an enemy to deploy is the first step towards immobilizing him, because deployment limits power of manoeuvre, and to retain this power is the object of all advanced guard work. When deployed, protection is gained by outposts, battle outposts and patrols.

FLANK GUARDS.

43. Composition and action of a flank guard.

In existing conditions of warfare it must never be overlooked that an advanced guard only protects the front of an army, and that all forces have as well as a front a rear, two flanks and a top.

Until recently, as I have already pointed out, the front to a considerable extent protected the flanks, but,

since the advent of the motor car, this is no longer so, and flank protection is becoming more and more important.

Like an advanced guard, a flank guard is a fighting force, and as the enemy it will probably meet will be either motorized or mechanized, it should also be allotted these troops and be strongly supported by armoured cars, which will prove invaluable in destroying motor car guerillas. Further still, as mobility, especially cross-country mobility, is even more important for a flank guard than for an advanced guard, the fewer marching troops it contains the better.

There are three types of flank guards, namely, a static protective force, a chain of flanking posts and a mobile force. Which is to be used depends on the nature of the country. Thus, if one main approach leads towards a flank of the advancing or retiring army, a static flank guard may prove sufficient. Should a range of mountains, a belt of forest land, or a river, lie to a flank, then a chain of posts holding the defiles, the road exits, or the bridges, will probably meet the bill. Should however, the country be open, then a mobile force will be required, not strung out like a chain but kept concentrated in a central position with armoured car patrols well out on its outer flank. A strong armoured force co-operating with aircraft will undoubtedly furnish the best protection. Failing this, then motorized infantry and artillery.

REAR GUARDS.

44. Action of a rear guard to a retreating force.

Should a man carrying an umbrella be pursued by a cow, from time to time, as the animal nears him, he will suddenly turn round open and close this frail weapon, and whilst the cow is startled by such an unlooked for display of force, he will continue his retirement to the

nearest hedge. Analysing his action we soon discover that its foundations are not physical force but a combination of mobility, correct timing and surprise.

Replace the umbrella by a mobile force of all arms, not necessarily a large force, but never, if avoidable, a tired out and disorganized force, and these are the principles we should apply; for the object of a rear guard is to keep the enemy at a distance and never become so involved in a fight as to jeopardise a withdrawal. To attempt to delay his advance by physical force, that is by fighting him, must sooner or later end in a clinch, and as this is to be avoided the only remaining means are to attack his nerves, that is to threaten and surprise him.

As it happens, this method of delaying him is easier in a rear guard action than in any other, because, whilst in a pursuit time is all important, the rear guard can carry out a fairly thorough reconnaissance of the ground as it falls back, whilst the pursuer has little time or opportunity of doing so whilst he advances.

The old idea of falling back taking up a position which the pursuing force must attack, and consequently deploy before he attacks, and then slipping away when he has deployed, is, so I think, the exception rather than the rule. It is too orderly and regular to be practical under modern conditions. What is more likely to occur is a running fight. Continual pressure on the rear detachments to compel their reinforcement, and simultaneously a movement of motorized forces on the flanks of the retiring army in order to head it off from its line of retreat, and in the end possibly surround it.

A rear guard should retire by bounds, and it should never halt long on any one position. Each bound should be decided upon as I have already described; it should constitute a tactical area not between two natural obstacles but including one, such as a range of hills, a belt of forest land, or a river. Each of these tactical areas should be reconnoitred in advance from the point of view of ambushes, ruses and surprisals generally. The

two most important weapons to effect these are machine guns and tanks, the latter covering the withdrawal of the former. A sudden tank attack, or the appearance of a tank, or the sudden opening of machine gun fire from an unexpected quarter will generally delay an enemy as surely as the opening of an umbrella will a cow.

In several ways the position of a rear guard commander is a peculiar one. He is much more independent than an advanced guard commander, and consequently must be more self-reliant. The main body is moving away from him and not towards him ; the force commander will seldom be near to consult. He will be thrown almost entirely on his own resources, and will consequently have to make the most of fleeting opportunities.

45. Action of a Rear Guard in Close Contact with the Enemy.

The retreat of a force takes place under one of two conditions, either it is voluntary or involuntary. In the first, time is usually sufficient to make full preparations for retreat ; in the second, preparations have to be hastily made, and unless a strong reserve has been kept in hand the danger of a retreat becoming a rout is always present. This happened to Napoleon after Waterloo, and to General Lee when in his final campaign he fell back to Appomattox Court House.

In either case the first thing to do is to take up a position sufficiently distant from the battle front to enable it being thoroughly well organized for defence. It should possess—

(a) Good lateral communications.

(b) Good flank protection and anti-tank obstacles.

(c) And possibilities of attacking the enemy in flank.

More and more do I think that river lines will be selected, as they constitute definite obstacles to armoured attack. The great danger when the enemy possesses

tanks and armoured cars is that of the rear guard being cut off from the main body.

Once such a position has been occupied by the reserves, the troops engaged in the battle should be withdrawn through it. This withdrawal will normally take place at night time, for more often than not in day time it will be found quite impossible to disengage. They should then for a brief space be rested and re-organized as a fresh reserve, which should as soon as possible move to the rear and reconnoitre another delaying position, sufficiently distant from the first to compel the enemy to move forward the whole of his artillery.

If the rear guard has been ordered to work on a time programme, each position taken up will be held to a certain hour. The entire action is one of two echelons of troops leap-frogging through each other from position to position not so much to occupy them as to cover each other's retirement, the main delaying action taking place between them in the form of a running fight. This, as I have explained, should be based on ambushes and surprisals, a constant hitting at the enemy's nerves to induce caution, which in its turn will induce delay. The action should consequently be continuous and not spasmodic, and when possible should be supplemented by demolitions which will slow down the pursuit.

46. Demolition Schemes and Expedients for Delaying an Enemy's Advance.

The great difficulty in carrying out demolitions is the time required wherein to prepare them. When, early in 1917, the German forces fell back to what was known as the Hindenburg Line, every road was blown, every village destroyed and nearly every orchard cut down; but when we were driven back in March the following year, few demolitions were carried out, and an immense booty of hospital stores, entrenching material, locomotives, etc., fell into the German hands. Time, therefore, is the

deciding factor, and when time is limited it will be useless to attempt to create large belts of obstacles which require weeks of preparation. In place it will be far better to concentrate on the demolition of bridges in order to delay motorized and mechanized pursuit. Yet it must be remembered that unless such demolitions can be carried out on a wide front, the pursuer will not be long delayed. He will turn them by means of motorized troops, consequently flanking obstacles to a retiring force should be looked for. For example: A retirement carried out between two rivers will, in many cases, be better protected than one with a river immediately in its rear, especially if the bridges over these flanking rivers are blown.

47. Rear Guard to a Force Advancing.

To-day there is always a possibility of a rear attack, not so much by strong forces as by armed motor cars, consequently all transport will either have to be protected by a rear guard or be given an escort. In the case of a rear guard to a force advancing, it should be allotted a small number of armoured cars. Generally speaking this will be possible, because the reserves of armoured troops will march in rear of the main body.

LECTURE VII.

CHAPTER VI. PROTECTION.
PROTECTION WHEN AT REST.

48. General Nature of Outpost Duty.

The subject of outposts is one which needs a good deal of thought because protection at rest is strongly influenced by mobility. The object of outposts is to prevent an enemy gaining information, to secure rest for the bulk of the troops, and to gain sufficient time wherein to resist an attack should one be made.

As formerly the fortifications of a city were close in, for the range of artillery was low, so until quite recently outposts, which are human fortifications, were close in, because the speed of attack was low. To-day this is changing, and on account of petrol driven vehicles, the outposts will have to be planned on a deeper system than made use of in past wars.

To watch an enemy does not only mean to be in a position to see him should he approach, but to discover him, and keep him under observation before he sets out to do so. As the enemy may be many miles away, this demands a division between the main watching and main resisting forces of the outposts; these two forces are represented by the contact and the fighting troops. To maintain contact with the enemy is becoming more and more difficult, and demands constant reconnaissance which may be divided into three classes:

(a) Local reconnaissance, carried out by cavalry and infantry patrols.

(b) Medium reconnaissance, by armoured cars and motor cars.

(c) And distant reconnaissance, by aircraft.

We thus get three zones of reconnaissance round the outpost position, and in my opinion the medium and the distant zones should come directly under the orders of the force commander, the commander of the outposts being only responsible for local reconnaissance.

49. Factors Affecting Protective Measures.

Outposts have got to meet any form of attack, coming from any direction, though naturally certain directions will be more important than others. What does the form of attack depend upon? First, the nature of the country, and secondly, the nature of the enemy's fighting forces and their arms and means of movement.

Should the enemy be employing guerilla, or irregular, troops, as he probably will when fighting in his own country, constant petty annoyances may be expected, which will demand strong fighting patrols, especially armoured cars and light tanks, to put a stop to them.

As regards an organized enemy we are told that the chief factor is, is he within striking distance? What is striking distance? Though his main body may be composed of marching troops, he may possess armoured and motorized forces. Whilst in the past twenty miles was a long day's march, now, in many cases one hundred miles will in time be no further.

If the country is mountainous, or covered with forests, or intersected by rivers, the likelihood of mechanized or motorized attack is slight. Thus we see, that the nature of the ground and the mobility of the enemy are the two factors which most closely affect outposts.

50. Protective Measures when the Enemy's Main Forces are not Within Striking Distance.

When the enemy's main forces are not within striking distance, which generally will mean that he is weak in armoured troops, and consequently is unable to deliver strong long range blows, the main object in outpost work

will be to prevent him obtaining information. This entails air superiority, anyhow local, and all round protection thrown fairly far out so as to establish a closed area or zone between this protective ring and the troops at rest.

All round protection is of increasing importance, not so much because the enemy can attack from any direction, but because he can disturb and annoy. This protection must include all the rear services, and consist in blocking roads and establishing anti-tank defences.

As regards anti-tank defence, the common conception is the use of static guns defending roads and approaches.

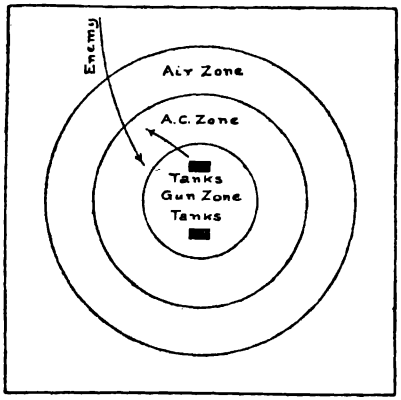

Diagram 4. Anti-Tank Defence.

This is all very well in its way, and an excellent system if the enemy can be induced to fall upon these weapons unawares. Though chance often plays a leading part in war, to rely solely on static guns is to gamble with fate. A better system would appear to be (See diagram 4.) to organise anti-tank defence into three zones, namely, the air zone, the armoured car zone and the gun zone, the first two being about ten miles in width. This will mean, that when the enemy approaches to within some twenty-five miles of the protected position his movements will be observed.

To carry out the work of observation, large numbers of aeroplanes and armoured cars are not necessary. One aeroplane at a time should prove sufficient to patrol the air zone, and one or two sections of armoured cars the armoured car zone. Frequently armoured cars may well be replaced by motor cars with anti-tank weapons. In which case it would be an advantage for armoured cars, or tanks, to be held in reserve in two groups within the gun zone, ready to move out into the armoured car zone and attack an enemy in flank as he is attempting to break through the gun zone.

Once again this problem like most others is one of finding, holding and hitting. It is quite insufficient to block, that is to hold up, unless mobility can be developed from this holding up, and an enemy out-manoeuvred and hit in flank or rear. The answer to the tank, the armoured car and the armed motor car is not the anti-tank gun or the machine gun, but mobile offensive power developed from the local protection these weapons establish. Static weapons may be likened to pliers which grip, whilst mobile to hammers which through being wielded hit the thing held.

51. Protective measures when the enemy's main forces are within striking distance

The nearer a force approaches the enemy the securer it becomes from sudden organized flank and rear attacks, because the nearer your opponent is to you, the more has he to collect his forces, like a cat hunching its back, so that he may be ready to spring upon you. No army commanded by any but a third rate general will dissipate his forces when threatened by the enemy's near approach. This, however, does not refer to guerilla forces, which, as the advance deepens in an enemy's country, are likely to become more and more active; for every additional mile will render the line of communications more vulnerable to attack. Nevertheless, as we are told, every

halt demands a battle deployment, "to resist any form of attack possible." What does this mean? It means that whilst hitherto observation was the primary problem, with it must now be bracketed that of local defence.

We are further told that "a suitable position" should be occupied. What is a suitable position? It is one which will enable a commander to develop his plan. Consequently, it is not solely a position which will protect him and his men, but which will enable pressure to be developed in certain directions and resistance in others. It does not necessarily mean an impregnable position, but rather one possessing good inter-communication where pressure is to be developed and good powers of resistance, such as machine gun positions and anti-tank obstacles, where resistance is required.

Its suitability for outposts is important, for the stronger are the positions occupied by these forces the weaker can their garrisons be, and in this stage of the advance economy in detachments and consequent increase in reserves is imperative in order to be able to concentrate in any direction. Generally speaking, the most suitable outpost position is one which forms a semi-circular line of natural bastions—hills, woods, villages, farmhouses, etc., which can be held by machine guns, and patrolled in between. In my opinion the machine gun is by far the most effective outpost weapon we at present have.

52. Protection during battle.

Protection during battle will depend to a large extent on the excellence of the protective measures adopted immediately before battle, because these will form the foundation upon which the edifice of battle is built. It is for this reason, that in the last section I have accentuated the importance of selecting a position which will enable a commander to develop his plan, and not merely protect it. If he has *selected* a position, and this does not mean making the best of any position, but

manoeuvring his opponent in such a way that he himself can occupy a locality which offers good flank and rear protection, that is one which as far as mobile warfare allows will protect the rear services and communications, and if simultaneously he has manoeuvred the enemy into one which does not offer these advantages, then before a shot is fired the battle is already half won.

As the front no longer so completely protects the rear as formerly, should it be impossible to take up a position protecting the rear, then normally it will be as well to echelon the flanks back (see diagram 5.), keeping an armoured force, or armoured troops, in a central position in rear, so that it may take in flank any enemy force attempting to turn the front.

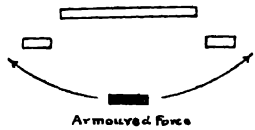

Diagram 5. Rear Protection.

53. Commanders in an Outpost System.

Normally, I think that the outposts will be developed from the guards, especially if these are strong. This is suggested in paragraph 1 of this section. Should this be done, a slight difficulty will arise as regards the outpost commander; for if an advanced guard, two flank guards and a rear guard simultaneously provide sections of the all-round system of outposts, there will be four commanders in place of one. In this case I consider that the force commander himself becomes the co-ordinating authority, and being responsible for the security of the entire force is equally responsible for its all round protection.

I do not intend to examine the rest of this section, not because it is unimportant, but because the information imparted is obvious.

54. Miscellaneous.

I do not particularly like the heading of this section, because the points it includes are of outstanding importance, and apt to be neglected. For instance, patrolling is, in my opinion, far less efficiently carried out to-day than it was thirty years ago. Then, in many regiments, the traditions of the Peninsula War lingered on, and during this war patrolling was reduced to a fine art.

Patrolling to-day should be carried out by motor car and motor bicycle, the two often combined, as well as by men on foot and on horseback. Intercommunication can also be maintained by these vehicles, and certainly in the case of detached posts they will prove invaluable, for if threatened, or attacked, these can easily withdraw.

OTHER PROTECTIVE DUTIES.

55. Artillery Escorts.

I do not agree with this section when it says, that "Artillery is, as a rule, protected automatically by the distribution of the other arms." It is true, as a rule, that the enemy is unlikely to be able to spare tanks and armoured cars to circumvent a front and cut out guns and more especially their wagon lines. But the enemy will be particularly wanting in audacity should he fail to attempt to do this by means of motor car guerillas. Time and again during peace training I have seen occasions when half a dozen bold men could have with impunity approached by car to within a few hundred yards of a wagon line, have crept forward, and shot every animal in five minutes. Frequently these lines are two miles away from any supporting infantry. To-day it should be considered the rule and not the exception that artillery will require an infantry escort, and in some cases an anti-tank one also.

56. Protection of Convoys.

In the course of these lectures I have already pointed out the growing importance of the convoy system as a means of protecting supply columns. In small wars it is well recognized, as also is it in sea warfare, because the submarine can circumvent the battle fleet. Equally can the tank, armoured car, motor car and aeroplane circumvent the battle front, or the mass of the army, which in all armies is still a marching mass ; consequently the protection of transport is an essential operation of war, for as always an army marches upon its belly, and its columns are its stomach.

There are two systems of protecting convoys, namely, by defended posts or by escorts. In all probability these will be combined as they were during the South African War, when blockhouse lines represented the defended posts, and mounted infantry provided the escorts.

The outstanding difficulty in this protective work is that the convoy is tied down to a road, its powers of movement are one-dimensional, whilst the enemy is operating in an area, consequently his powers are two-dimensional. Even if moving in motor cars he can use many more roads than the convoy can. To mitigate this disadvantage, it would appear that the smaller and faster the convoy is the safer will its movement be ; further, that as all supply columns are now motorized, motorized troops must form their escort.

An escort should work well out to the flanks, because as the convoy cannot move off the road, it must be kept out of rifle shot ; besides, against modern fire-arms it would be useless to form laager, or coral the vehicles, as the American settlers used to do when attacked by Red Indians, or the Dutch in South Africa by Zulus. If the protection is distant, a zone of comparative safety will be created ; the object of the escort being not so much to prevent penetration into this zone as to threaten any

enemy in flank or rear who is bold enough to enter it. In a permanent line of communications, the escort should form part of the defended posts, working out from them and back to them when their protective duties are finished.

The commonest solution to this and similar problems is to block all side roads. I do not say that blocking is useless, but I do think, when this system is suggested, it might be realised that most continental roads are open and not ditched and fenced like those in our own country. To block a road running through fenceless fields is about as sensible as putting a cork into a soup tureen ; in most cases it will be sheer waste of time. Should a tract of country be found, resembling, say, Kent or Surrey, then to block all the side roads will demand an army of its own, just as the picketing of a mountain pass does in India.

Lastly, for these operations I do not consider that night movements will normally prove profitable. They are extremely slow and exhausting when headlights are not allowed, and it should be remembered that the ideal time for the motor car guerilla to work in is night and not day. If boldly handled, these men will snipe the leading lorry with a machine gun, and then whilst confusion reigns will retire on their cars and motor bicycles which may be several miles away. At night the risk of their being taken in flank or rear is small.

57. Protection of Railways.

The protection of railways closely resembles that of road convoys, but as railways are generally speaking communications of less changeable nature than roads, their defences must be of a more permanent type, consisting of defended posts, block-houses, wire fences, and land mines protecting bridges and culverts. From the posts should work forward on the flanks of the intervals in between them strong patrols capable of dealing with hostile armoured cars and motor cars. In

some cases when the enemy is very active it may be necessary to protect the intervals themselves by a chain of block-houses. This was done in the South African War, the block-houses being linked together by wire fences and alarm gadgets.

58. Protection from Aircraft.

Protection against aircraft is obtained either by small arms, anti-aircraft artillery, or by aircraft. Troops must always, whether at rest or on the march, be ready to protect themselves against air attack. Infantry should not solely depend on anti-aircraft artillery, but must be prepared at any moment to use their own arms. On the line of march this is difficult as long as they are armed with machine guns carried in limbers. When a lighter gun is issued, and for many reasons one is badly needed, this difficulty will to a considerable extent be overcome. In any case, infantry must realize that anti-aircraft artillery can seldom protect them against low flying attack.

Protection against air attack mainly depends on a well worked out plan of air defence, in which all arms, machine guns, anti-aircraft guns and aeroplanes co-operate by taking on certain phases of the defence. Whenever infantry are at rest air sentries must be posted and all ranks must understand what is required of them on the alarm sounding. Generally speaking, they are unlikely to encounter low flying attack except on bridges and in defiles. Protection of transport columns is the main difficulty, and here again small fast-moving columns will be less vulnerable than long slow moving ones. Adequate spacing between groups of vehicles is all important ; this may be compared to the intervals between the skirmishers in a firing line.

The use of anti-aircraft artillery dates from the early period of the last war. In theory, though somewhat complex, it is not difficult, for most of the measurements

required are worked out by calculating machines in a few seconds. In practice it is much the reverse, for the object of these weapons is to protect areas, and of areas there are two kinds, namely, the fixed area such as a railhead or city, and the shifting area, such as the ground covered by a marching column.

As regards the first, the problem is normally simple enough, as the guns and lights are automatically protected by permanent defences. In the second, it is far from being so, especially in a hostile country, unless anti-aircraft units move within the chain of guards, or are provided with guards of their own. To send these weapons out unescorted is to ask for trouble.

59. Concealment from the Air.

Concealment from air observation is one of the most difficult problems which faces an army to-day. Woods and wooded country are likely to grow in importance, but wooded country is not generally good country for mechanized forces to operate in, unless the woods are small and scattered. Smaller formations, using several roads, the careful concealing of headquarters, the burning of oil in place of coal and wood in field kitchens, the use of natural camouflage and the rapid shifting from cover to cover are all means of mitigating this difficulty, which can often be taken advantage of by the use of empty bus columns, and the creation of false tank tracks to bewilder an enemy.

LECTURE VIII.

CHAPTER VII. THE ATTACK.

60. General Principles.

In this chapter we turn to the execution of the plan in the form of the attack. The plan may be compared to a blue print which guides an engineer in his work. Whatever form of execution is decided upon the principles remain the same; but according to the nature of the work to be undertaken they must be applied so as to fit the conditions which surround them at the moment. These—the tactical value of the ground, the enemy's dispositions and his morale are constantly changing and application must change with them, consequently unceasing reconnaissance is necessary.

Ease of execution depends largely upon the simplicity of the plan. If the flanks and rear of the attacking force are secured, its commander will only have to consider the safety of its front. Security also depends upon establishing a strong protective base of action. From such a base can be developed in logical sequence, holding, manoeuvring and hitting. Each unit, or group of units, must be allotted definite objectives—points to pin the enemy down to, or to manoeuvre from, or hit at. Like tools, units must be distributed according to tactical objectives, and it should be remembered that objectives only become tactical features when they are held.

How can the strength of the enemy be ascertained? The surest answer to this question is by hitting him. I have already quoted Napoleon's saying, "I attack to be attacked," a saying which will bear repetition. A bold

initiative unmasks an enemy, and an enemy unmasked is an enemy found. Finding is the first step towards manoeuvring, just as hitting is the first step towards holding. Only when an enemy is held, is liberty of manoeuvre gained, and liberty of manoeuvre carries with it freedom of action which is the aim of all generalship.

61. Objectives and frontages.

The plan itself is the theory of what is to be done, and objectives are the pivots of what to do. The most effective thing to do is to strike the enemy in rear. This is the controlling idea in spite of the fact that at the moment it may be the most difficult thing to do. When this is so, we should work towards a flank, because a flank is the next nearest position to the rear, and if both flanks are so well protected as to be unattackable, we are compelled to select the front, or rather some point in it which if captured will affect a flank or the rear. If such a point cannot be found we may have to penetrate the front or drive it in, yet again the idea is the same, namely, to create flanks or gain a position from where we can threaten the enemy's rear.

Objectives should be definite, as definite as the goal posts on a football field, or the rounds in a ladder, each should be related to the last until the final one is gained. Unless objectives are limited it is next to impossible to make them definite. Such a thing as an unlimited objective does not exist, because the distance from starting point to goal is always limited by the endurance of the troops, who "are soon affected by physical and moral exhaustion." One of the main difficulties in selecting objectives, or steps of progress towards an objective, is to equate the endurance of the men with the resistance likely to be met.

Again, objectives are like the keys of an instrument, by means of them a commander plays his tune, some require to be struck lightly others with strength.

Endurance depends on maintenance of:—

(a) Moral power,
(b) Physical power, and
(c) Material power, or supply.

All three are influenced by many factors, of which one of the most important is depth, for it gives confidence, it secures resistance, and by protecting the rear it facilitates supply.

The depth decided upon is usually arrived at by calculating the resistance which is likely to be met. Depth in itself is not a virtue, but a condition governed by resistance and flank protection. The form which depth takes is either a series of complete units, such as a battalion behind a battalion, or a series of sub-units, such as a company behind a company, or a platoon behind a platoon. Which of these is decided upon depends upon the depth of the advance. If the distance to be traversed is slight, the first of these systems is usually best and causes less confusion; if considerable, then the second, because continuity of movement is easier gained by advancing successive fractions of one unit, or formation, than a series of separate units or formations. The main reason for this is that the command is not changed, and men follow their cap badges less reluctantly than those of other units.

Once the objectives are settled upon, the next question is to examine the flanks. Of flanks there are two types—external and internal, the internal ones being those points where the flanks of the various units meet. These are always points to be watched, as they are points of junction between subordinate commands, and their strength depends on the closest co-operation between their commanders. For the first, the external flanks, special measures must be taken to protect them, such as, throwing them back, that is refusing them, or by echeloning troops in rear of them, or by covering them by fire.

Having considered the safety of the external flanks,

and co-operation between the internal ones, the last problem is to examine the frontages of attack.

A frontage is the width of the objective to be attacked by a given number of troops, and this width depends on the resistance the enemy is likely to offer and the protection which can be afforded the attackers. "The front of attack which can be supported by the artillery of a division is very small," about 800 yards if the enemy is strongly posted, and even less if he is entrenched. Frontages can be widened by using tanks, but the risk of using these weapons in a frontal attack is considerable if the enemy is equipped with anti-tank weapons. Whether used or not, the piling in of infantry is to be deprecated, for it can only lead to useless slaughter.

THE GAINING OF CONTACT.

62. Special Considerations.

On gaining contact the object at once becomes one of discovery, of uncovering the enemy by penetrating or thrusting aside his protective curtain of troops. As in an encounter battle the enemy's object will be the same, audacity coupled with rapidity of decision and action are the factors which are the more likely to gain this end. As both protective screens will normally be spread out on a wide and shallow front, and will be at no great distance from the main forces following them, it is all important that a commander should possess the tactical sense to select, after the briefest consideration, the tactical points vital to the security of the enemy's protective screen, as it were the hooks it is hanging on. To attack these frontally is to court delay, consequently, whenever possible, they should at once be outflanked and threatened in rear. The ground being suitable, obviously this can be most rapidly carried out by armoured troops.

Should the hostile protective forces be thrown back,

the initiative is at once gained, for the enemy will be compelled to modify his plan. This gaining of the initiative from the very opening of battle is so important, that, as I have pointed out in a previous lecture, the initial action should be decided upon by the force commander, and not by the advanced guard commander. This in no way is an infringement of responsibilities, for, be it remembered, the true battle is one between plans, and in a well led army the modifications of a plan must not be thrust upon a commander but must be decided upon by himself.

In former days the force commander was with his troops and could closely watch his enemy on the ground, now he must watch his enemy on a map, like a chess player watches his board; consequently the correctness of his judgments will largely depend on the excellence of his intelligence staff. If all important enemy movements are brought to his notice, and if the means of distributing orders is efficient, he is at no greater disadvantage to-day than he was a hundred years ago.

In a lesser degree the same applies to the command of the artillery. The artillery commander must also watch the pieces on the board, and be in closest touch with the force commander, because alterations in artillery fire and dispositions frequently require a considerable time to effect, and obviously can be more rapidly carried out if these two commanders work in close co-operation.

The watching of the pieces on the board depends considerably on the flank protection of the attacking troops. This applies to all commanders. If they can keep their eyes fixed on their respective objectives, concentration of mind, the foundation of concentration of force, will result. If they have constantly to glance over their shoulders they will have to think in two or three directions in place of one, and if their rear is also threatened, possibly in four. But when their flanks and rear are safe they can project all their thoughts forward. This is not only a mental but a physical advantage.

THE ATTACK.

63. Special Considerations.

The changing of a plan of action depends on time, ground and method. Time for a commander to prepare an attack in largely depends upon the time available for the enemy to meet it, and even more on a sufficiency of time for subordinate commanders to carry out their dispositions in an orderly way. The various calculations as regards time are a matter for the staff, and at any moment an efficient staff officer should be able to inform his general what a proposal represents in terms of time. Whilst a commander examines his map from the point of view of positions, one of his staff should be constantly thinking in terms of time. Time again is vastly speeded up if subordinates are not only energetic and skilful but ready to carry out the tasks ordered with the means at hand, and not at once ask for something they have not got. A man who is always asking for support is a man who normally is lacking in self-reliance.

Ground may be divided into three categories—to protect movement, to see from and to move over, and the nature of these three categories varies with the weapons used. Thus, observation for artillery is vital, but quite secondary to tanks; broken ground for infantry is important, but detrimental to tanks; and open country, especially of an undulating nature, is advantageous to tanks and disadvantageous to infantry. Consequently it is not sufficient to look at ground generally, but from the point of view of the arms to be used, and particularly from that of the predominant arm. If you are banking upon artillery then look at the ground from an artillery point of view, if on tanks, from a tank point of view. The normal mistake is to consider it from an infantry point of view, and then fit in the other arms as best you can. This is the very worst turn you can play the infantry, for remember that in section 10 of *F.S.R.* it is

clearly stated that "Concentration of artillery fire and the co-operation of armoured fighting vehicles are the best methods of assisting the advance of the infantry. . .'

Method depends on envelopment or penetration, and under envelopment may be included the rear attack, which is envelopment in its most decisive form.

In armies as organized to-day, that is mainly on an infantry basis, envelopment does not necessarily lead to decisive results, because of the enormous stopping power of the machine gun on the defensive. But when tanks, anti-machine gun weapons, are used in numbers it is likely to lead to overwhelming results. Whilst a frontal attack is almost purely a tactical operation, an enveloping attack is also a strategical and moral operation, because it attacks the enemy's communications and consequently sets his nerves on edge. Further, from a tactical point of view, it can generally bring to bear concentric in place of frontal fire. It, therefore, delivers three attacks in one.

Surprise in such attacks is a potent factor, but I disagree with *F.S.R.* when they say "Surprise is essential," if by surprise is meant an unexpected event. Should the enemy's front be firmly held it is not necessarily so. Again, an enemy may not find time wherein to change his front, even if it is not held. This shows the value of an extended front of advance, especially when the attacker possesses motorized or armoured forces; for by rapidly converging them on a point he may be able to overwhelm it before it can be reinforced. The power of the machine gun to hold and of mechanical transport to move will undoubtedly re-establish envelopment as the most important method of delivering battle.

Penetration, if successful, is frequently decisive; but success means a complete break through and not a mere bending in, which was the normal result of trench attacks in the last war. The main disadvantage of an attack of penetration is that usually surprise is impossible,

consequently reliance has to be placed on methodical preparations, and these consume much time, and the longer they take the more time does the enemy gain to meet them. They are comparatively easy to organize, but difficult to carry through.

As I shall be dealing with the trench attack in another lecture, I will here examine it only generally. Should the enemy hold a wide front, the main difficulty is to stabilize those parts of his front which are not to be penetrated. Unless this is done, failing a penetration of extreme rapidity, the enemy will draw in troops from the front not attacked, and envelop the flanks of the penetrating force.

Failing surprise in such attacks as these, as *F.S.R.* clearly say: "It is by . . . superior fire power and not by men's bodies that success is won. Mere weight of numbers in the infantry assault [? attack] will not of itself be effective and will result only in unnecessary casualties."

Not only can infantry no longer act independently (except in a few special circumstances, such as forest fighting), but they cannot act at all unless they are strongly supported by artillery or tanks, or both. "Artillery conquers, infantry occupies" is a saying I have already quoted, and it is one which bears repetition, so also does "Tanks conquer, infantry hold." As regards artillery, as *F.S.R.* say: "The bulk of the artillery supporting the main attack must therefore be sited well forward," and by well forward is not meant two or more miles in rear. As regards tanks, these weapons must be given very clear and definite objectives, and usually to a flank of the main infantry defence. Strong reserves should always be held in hand, for, if penetration is effected, immediate exploitation should take place; for the object of this method of attack is not to break the front but to attack the rear behind it. It is like breaking through a fence, the parting of the branches is but a a means of getting into the next field.

64. General Conduct of the Attack.

In an attack to-day, success more than ever depends upon a correct distribution of weapons to ground. Open plain land can no longer be considered even feasible country for infantry to attack over, because such country can be rendered impassable by a comparatively small number of machine guns. In broken country what is required is light infantry and not infantry of the line—workers of machine guns and light automatics. When infantry, through force of circumstances, are compelled to fight in open country, then they must be escorted across it by either artillery fire, machine gun fire, or tanks, probably all three combined.

In *F.S.R.* we are told that " Whatever form of support is adopted, covering fire, to be effective must be concentrated on those portions of the front where the attack is to be driven home." In attacks of penetration I agree, but in outflanking movements I disagree, because in nine cases out of ten this concentration of fire will defeat surprise. In such cases the object of concentrated fire is to pin an enemy down so that he cannot reinforce the point at which the attack is going to be driven home.

The barrage fire of artillery is the most potent form of covering fire which can be delivered, but it demands an enormous number of guns, normally one to ten yards of front. Even then, unless the enemy's defences have been subjected to an intense bombardment, barrages frequently do not destroy the enemy's machine gun defence. When barrages are resorted to, in the initial stage of an attack, artillery will generally work to a time programme, that is to say the guns will increase their range so many yards in so many minutes, their shell fire slowly escorting the infantry advance.

These barrages should normally be strongly reinforced by machine gun fire, and as *F.S.R.* state " Machine guns are most effective when using direct fire "; this is certainly true in the field attack. In such attacks overhead fire is

often dangerous, as it is most difficult to know at any moment where the advancing infantry are. If this fire is to be used, then again a time programme should be made out for it.

The third method of covering an infantry attack is by means of tanks, which can replace the artillery barrage by advancing in front of the infantry, as they did at the battle of Cambrai in 1917, or by moving from a flank diagonally upon the objective. In either method the tanks should be strongly protected by artillery fire and aircraft.

Once the objective is occupied it should be immediately consolidated by taking up a series of machine gun positions, a minimum number of riflemen being used. The front should at once be extended in order to protect the flanks and the ground in rear over which reinforcements or the pursuit will advance .

In this section a large number of general factors are mentioned, the most important of which are: Constant touch with neighbouring units in order to maintain the tactical framework of the attack, and constant information to the commander so that he may be prepared to change it or make use of his reserves. Constant observation of the enemy and particularly his reserves by aircraft, and the bombing of the enemy's headquarters in order to attack the nerves of his command.

LECTURE IX.

CHAPTER VII.

THE ATTACK.

65. Infantry in the Attack.

To the infantry soldier this section of *F.S.R.* is of the greatest importance; once again is the weakness of infantry as a separate arm accentuated. Infantry, we are told, can confirm the victory and hold the ground won, confirming is not fighting in the ordinary meaning of the word, any more than confirming a court martial means taking part in it, and ability to hold will depend on whether the enemy, should he counter-attack, employs armoured troops or not. If he does the ability of the infantry to hold a position will be much reduced and frequently negligible, unless supported by armoured troops. As *F.S.R.* say: "Whereas the vulnerability of infantry remains unchanged, the destructive power of modern weapons tends to increase," and not only their destructive power but their self-protective power, as in the case of the tank.

To aid an infantry advance, even to within 800 yards of the enemy, demands in any open country enormous covering fire. Even at 2,000 yards' range, if the enemy is well supplied with machine guns he can sprinkle an area so completely with bullets as to make it extremely dangerous for infantry to cross it. Futher, we are told that infantry must adopt "suitable formations," what are these?

A suitable formation is one which offers the smallest possible target, an irregular front, and which fits the

ground like a hand does a glove. Further, one which will enable the attacker to develop effective fire, and with the fewest possible men sprinkle the enemy's position with the greatest possible number of bullets. If infantry are compared to a gambler, then depth of formation, which also means concentration of fire, is their banking account. It enables them to raise the stakes, that is push on; to meet misfortune, a counter attack, and to play high, or bluff, that is to terrify.

Without capital to back him up a player becomes timid, and so do infantry without depth of formation. Reserves imbue a commander with moral as well as with physical force. When the play is opened, a small stake, the forward units, is put up, for the game may be a long one, and the skilful gambler realizes the wisdom of keeping the bulk of his money in reserve.

In battle the advance on each successive objective may be compared to a reshuffle of the cards, for a new stake, a new body of troops, has to be put up. To send forward exhausted troops against a fresh objective is to court failure. It is morally wrong, especially in the case of troops who have already occupied an objective, for they very rightly feel that they have done their bit.

When possible, every attack should start from a moral base, that is a secure position not influenced by the terrifying bullets. The assembly should be under cover, where the men can be rested and fed, and not hugging mother earth to avoid shells, or listening to the zip-zip of bullets.

The starting line should also be secure, it is the tactical base, and should be easily recognisable and parallel to the objective, so that all the men have got to do is to move straight forward from it. Here the attackers should be formed into their attack formations, a concertina closed as it were, which can be opened when the advance is signalled. When this takes place it should be covered by the "greatest possible degree of artillery fire." In spite of this, if tanks are not used, unless the position

has been subjected to an intense bombardment, and the infantry are covered by a barrage as known in the great artillery battles of the last war, I see no reason to suppose that the attackers will normally be able to approach closer than within 800 yards of the enemy's position. If this is doubted, anyhow it should be remembered that in most armies automatic weapons have increased roughly twenty fold since 1914.

The stronger the covering fire the more direct the advance, which also depends upon landmarks, but which may be complicated by smoke. Smoke it should be remembered is only cover from view, and if the enemy opens machine gun fire on the smoke cloud its value is considerably reduced.

Changes of direction in open country under fire are generally impossible, yet should the attacking troops break away and seek cover, supports must be pushed up to take their place. Forward movement is best maintained by covering fire, for if infantry stop to fire, it is often difficult to get them on the move again. When infantry are obliged to fire, not only to assist their advance but to relieve the nervous tension they are working under, fire should be carefully controlled, men being pushed forward whilst others fire, so that the act of firing does not induce a static situation. What is required here is infiltration, that is the old light infantry work—holding, manoeuvring and hitting at a flank of the position held, which is seldom a line, but in place a zone of posts.

Considering infantry fire alone, by far the most important is that of the machine guns. Unfortunately, the present Vickers guns are heavy and cumbersome, consequently they are not so suited for forward work as the Lewis guns, which though heavy to carry are essential if any form of infantry fire superiority is to be gained.

My opinion is that the main use of machine guns and light automatics is to pin an enemy to his position, that is to box him in by streams of bullets. Firing on localities which afford him observation, on approaches and exits,

in fact upon all points which affect his mobility. They also should be used to protect the flanks of the advancing infantry, cover gaps by fire and be prepared to silence counter-attacks.

Machine guns are usually divided into three groups —the forward guns, the supporting guns and the guns in reserve. The first co-operate closely with the riflemen, and the second cover their advance and protect their flanks. Economy of machine gun fire is only possible if co-ordinated with artillery fire, consequently the probability is that machine guns will often have to be brigaded.

66. Artillery in the Attack.

Artillery fire may be divided into four categories, namely:

(a) Covering fire to infantry.
(b) Counter battery fire.
(c) Close support fire.
(d) Pro- and anti-tank fire.

All these require considerable time in preparation, especially the first two, consequently more so than that of any other arms is the artillery plan governed by time; therefore the infantry, or tank, plan should be as simple as possible; for if either is complicated the artillery plan will be delayed.

When time is short and urgency demands immediate action, though undesirable, decentralization is inevitable, which means the allotment of batteries, or artillery brigades, to infantry formations. For decentralization to work effectively there must be the closest co-operation between artillery and infantry commanders, which is quite impossible unless they understand each other's tactics.

For the infantry to advance, the enemy's resistance must be broken down. Where does this resistance mainly lie? In his machine guns and light automatics. For example, take our own battalion establishments: They

consist of 16 machine guns, 24 Lewis guns and 168 rifles. On the assumption that the first two can each on an average fire 200 rounds a minute, and the rifles 10 rounds a minute, then the respective fire powers will be 8,000 bullets to 1,680 bullets. This clearly shows where resistance comes from.

Frequently the attacking infantry will be able to locate the enemy machine guns, or anyhow the areas in which they are firing; consequently artillery forward observation officers must be well up, and if frontages of attack have been selected from the point of view of artillery covering fire, and not solely from that of infantry movement, this work will be greatly facilitated.

It should never be forgotten that to-day, if tanks are not used, artillery is the base of infantry action in the attack, and that machine gun fire is the main strength of infantry on the defence. That the field gun is not a weapon of precision, it is not made to hit a bull's eye but a much larger area. To place a number of shells in succession into a square of thirty by thirty yards at a range of four to five thousand yards is extremely accurate shooting. Therefore, even if a hostile machine gun can be pin-pointed on a large scale map, though it may not be a difficult target to shift, it is by no means an easy target to hit. To shift an enemy machine gun is simply to silence it for a few minutes, consequently, when we closely examine this problem we cannot help coming to the conclusion, that except when using barrage fire the field gun is not an efficient anti-machine gun weapon.

In my opinion, incomparably the most effective weapon will be the light tank, when we are equipped with it; for being bullet-proof it can advance under machine gun covering fire against the enemy's machine gun fire. This covering fire will not only fix the enemy's machine guns, but will also disconcert any hostile anti-tank weapon in their vicinity. This fixing operation is important, as simultaneously it protects the light tanks and holds its prey until they can spring upon it.

Should no light tanks be available, then, if the ground is broken, whilst machine gun holds machine gun, sharpshooters should work forward under cover of ground and attempt to pick off the enemy's machine gunners—a true light infantry operation.

Either one or other of these methods of attack should be attempted before artillery is called upon. Not only do such calls upset the artillery plan, but they seldom can be answered under twenty minutes to half an hour, and if the attacker is under heavy fire, often not at all, on account of the difficulty of communication.

As the infantry have to be protected, so have the field guns themselves; how? By counter battery fire, the medium and heavy artillery forming their base of action. These weapons are generally controlled by corps headquarters, and the form of fire used is predicted, observation being carried out by aircraft.

Bombardments are standing barrages on localities, and creeping barrages are moving bombardments to protect advancing infantry, and are worked on a time programme.

Besides covering fire from the rear, infantry also want fire they can themselves control, that is close support artillery fire, and this fire is provided by the light artillery, mountain warfare howitzers. Their main function is anti-machine gun and anti-tank work, though for the second they are indifferent weapons.

When tanks are launched into the attack they also must be protected by artillery, generally firing smoke shell on likely enemy anti-tank positions, and also by machine gun fire, which is especially important as it can do the tanks no harm, and renders inaccurate all hostile fire directed against them in the areas swept.

67. Tanks in the Attack.

In theory we are supposed to possess three types of tank—medium, light and support; but in actuality, not counting experimental machines, we possess but one—the first, which in this section is alone considered, and

mainly with reference to infantry. The second type is represented by the Carden Loyd machine gun carrier, which is not a tank. The third, when it does materialize, will probably be a tank armed with a heavier gun than the present medium machine is.

When these three types are combined in one formation, an armoured force is created, and as such a force, a most powerful offensive instrument, if closely tied down to infantry will be seriously handicapped, its main role is likely to be independent action against a flank or the rear of the enemy's position. For such operations it will probably be held in hand until a clinch takes place, that is the holding of the enemy by the main attack. Then, under cover of darkness, it will disappear, move perhaps twenty or thirty miles during the night, halt, reorganize and replenish; and when the main attack is at its height, debouch from its lair and sweep down through the gun lines, rear services and headquarters of the enemy's army; the light tanks leading and the support tanks covering the attack of the medium machines.

To me it seems that the object of such an attack is to demoralize and disorganize the command, that is the base of action of the enemy's army. It is a blow at the foundations in place of the gradual removing of the tiles from the roof. It is an eruption which may through the terror and uncertainty it creates lead to a general panic; nevertheless, directly it begins to take effect, the main attack should be speeded up to maximum intensity, every weapon firing at maximum rate, and under this deluge of shells and bullets should a general advance be made to force back the enemy's front on to his demoralised rear.

Turning now to co-operation with infantry. Tanks can be used either to lead the infantry into battle, as happened at the battle of Cambrai, or what is more likely to-day, both will move forward from separate bases upon a common objective. In which case, once again the infantry should attempt to pin the enemy down while the

tanks strike him in rear, and, directly they do so, the infantry should move forward and occupy the position, the tanks rallying and coming into reserve close by.

Tanks should be used in strength and over good going, and they should be protected by gun fire and aircraft; the aeroplane scouting in front and searching for enemy gun positions and anti-tank weapons, which when found it can either attack or report to the artillery.

68. Cavalry in the attack.

Frankly I cannot swallow this section without grave risks of acute mental indigestion. Were *F.S.R.* considering oriental wars or, say, a war between Poland and Russia, much here laid down might be of value. But this is not so. In my opinion cavalry have little or no power in the attack, and are out of place upon a battle-field in a war of the first magnitude. They are still useful for gathering information, and if their armoured car squadrons act independently they should prove invaluable for purposes of flank protection.

69. Engineers in the attack.

Engineers are not strictly speaking combatant troops. On the battlefield their main duty is to facilitate and restrict movement. To improve communications, repair or build bridges to facilitate rear movements, or prepare them for demolition should a withdrawal appear probable. Also, to place certain areas in a state of defence. They should be brought into every battle plan; for if the attack succeeds they will be required in the pursuit, and if it fails in the withdrawal. They need considerable time to prepare their work in, and so should be warned of possibilities well ahead.

70. Aircraft in the attack.

Aircraft is an essential arm whether in attack or defence, advance or withdrawal. As already explained

in a previous lecture, the first operation in war is to clear the air, and before battle it is the same. To gain local air superiority is to gain local information. A blind man is a poor fighter, not because blindness deprives him of physical strength, but of the knowledge necessary to use it. A blind man, or a man groping in the dark, is surrounded by phantoms.

There are three categories of aeroplanes—fighters, bombers and army co-operation machines. The fighters clear the air, the bombers attack vital centres in order to demoralize the enemy and compel him to withdraw his fighters for protective work, and the co-operation squadrons reconnoitre for artillery, take photographs and carry out close reconnaissance. There must, therefore, be the closest possible touch between the officers commanding these squadrons and the general staff. The commander's appreciation, plan and intentions must be known to them, as well as the changes in dispositions made during the battle.

LECTURE X.

CHAPTER VII. THE ATTACK.

FURTHER CONSIDERATIONS FOR THE ATTACK ON AN ORGANIZED TRENCH SYSTEM.

71. Special Conditions.

This chapter of *F.S.R.* is packed with detailed information, the greater part of which I do not propose to touch upon. In place I will briefly deal with the theory of the trench attack.

To begin with, the theory of mobile warfare is the order of the day, just as it was before the outbreak of the last war, and why? This question is difficult to answer, for against a powerful continental army we have no greater justification to suppose that warfare will be mobile than we had in 1914.

Strategically, since 1918 mobility has been speeded up by the enormous increase in motor transport; yet in spite of the armed motor car, which will most certainly be used, tactically, mobility has been restricted by the vast increase in machine guns. In 1914, we went to war with two machine guns to a battalion, to-day if we went to war we should have 40 automatic weapons. In 1914, bullet power was so devastating that the whole theory of mobile warfare broke down within six weeks, and was followed by a war of trenches out-distancing anything of the kind seen in history. A war of trenches which lasted four years. What justification have we to-day to lay our tactical odds on mobility? We have

none, and yet, in my opinion, we are right to train for field warfare, nevertheless entirely wrong if we are unprepared for trench warfare, as we certainly are.

It will be said that the tank is the answer to the machine gun, and if the machine gun is defeated mobility can be gained. This is so, but were we to go to war to-morrow we could not put two battalions of efficient tanks into the field, and what would the war be like?

A rush to the frontiers; walls of machine gun bullets; a shortage of small arm ammunition; a pause; a feverish and chaotic digging of trenches; a barbed wire crisis; yells and yells for tanks of any description; a patching up of museum specimens, as the arsenals were scoured for trench mortars in 1914, which for a century or so had been carrying out decorative duties along their side walks and before their entrances. At length, at amazing cost, the development of armoured warfare, and the eventual destruction of the machine gun walls.

Therefore, we must be prepared for two phases of war—the static and the mobile, and if we cannot find time to practice both, then I think we are anyhow wise to think in terms of the second, for though we are better equipped for the first, it is not the road to victory but to mutual defeat.

The main characteristic of static warfare is that of a siege. If a fortress, or a castle, is to be attacked, there are four methods of reduction—assault, attrition, starvation and treachery. In the last war all were made use of. We attempted assaults and they failed; we attempted attrition, and found that it was a two-edged knife; we made use of blockade, and as always discovered in it a most potent weapon, and we spent much time and money upon newspaper propaganda splashing ourselves with our own mud.

Siege warfare is not in theory a difficult operation of war, but in practice an extremely costly one. The attack can be reduced to a drill, method and not surprise is its foundation, and, since the advent of air photography,

method can be reduced to a science; for the exact position and strength of the trenches are equally well known to both sides.

Plans may be compared to detailed blue prints, orders grow in length until they cover many pages; I have seen a corps attack order run to eighty-six, containing between twenty-five and thirty thousand words, that is over half the length of this series of lectures. Observation is exact, being electrified, so to speak, by sound ranging and flash spotting instruments. Covering fire is more powerful; at the Third Battle of Ypres, in 1917, 4,283,550 shells were fired in the preliminary bombardment alone, and to spend three or four milion pounds on a barrage is an event which scarcely bears notice.

The preparations for an attack on a strong trench system often require months of works, as was the case before the Battle of the Somme or the Third Battle of Ypres. Those laid down in paragraph 4. of this section are sufficient to show that surprise is out of the question. This was the case during the last war, until tank or gas attack replaced the barrage, reintroducing surprise by their power suddenly to cut through the enemy trenches or suffocate their garrisons.

72. Issue of Orders, Conferences and Preliminary Arrangements Prior to the Attack on an Organised Trench System.

The preliminary arrangements are many. There is the plan which is generally an ideal, followed by conferences to settle detail. The troops are trained, frequently in areas where life-sized models of the trenches they will eventually have to cross have been dug. Objectives are laid down, frontages decided upon, boundaries between units fixed, and barrage maps prepared. The administrative arrangements are multitudinous. The dumping of thousands and tens of thousands of tons of ammunition, engineer stores, petrol, forage, and fuel, etc.

The erecting of hospitals, laying of railways, building of new roads, prisoners' cages and aerodromes, and a hundred other things now forgotten. Before the battle of Arras, in April, 1917, the old chalk workings under this city were converted into an underground encampment to accommodate 20,000 men. They were laid out in unit areas with their cook-houses, headquarters, latrines, etc; and were connected by metre gauge lines, and lit by thousands of electric lights. At the battle of Messines, which was launched a little later, twenty-one mines were constructed, and sufficient explosives packed in them to demolish a fair sized town.

These two examples alone are sufficient to illustrate the stupendous labour required in preparing a trench attack.

73. Special Preliminary Measures in the Attack on an Organised Trench System.

The instructions in this paragraph should be carefully studied, for we are unable to find either the money or the time to carry them out during our peace training. We are utterly unprepared in this respect, and unless we know something about trench warfare, we shall once again be surprised by it.

74. General Conduct of the Attack on an Organised Trench System.

We are told that "Surprise is equally important in all forms of attack." This is a truism, but in a trench attack the difficulty is how to effect a surprisal in such a way that continuity of movement will result. It is true that an enemy can generally be surprised by the fixing of zero hour, or as *F.S.R.* say, "by the opening of effective fire by a mass of artillery at the moment of assault." Such surprisals, however, are like saying "boo" to the cook as she enters the pantry, they may startle her, but they

do not help to cook the dinner. Surprise is not an end but a means to an end, and even if the artillery preparation is "confined to a short and very intense bombardment just prior to the attack," it is quite possible that the enemy's outpost line will be overrun, but it is most unlikely that he, should he have learnt anything from the last war, will hold this line in strength. In place his forces will be concentrated half a mile or more in rear of it, and will be given notice even by the briefest of bombardments of what is about to happen.

Surprise, without the possibility of continuity of movement until the enemy's entire defences are penetrated on a wide front, is far more likely to prove a will-o'-the-wisp leading us into a bog, than a reliable lantern to assist us to find our way home to victory through the fog which covers every battlefield.

The only reliable means of surprise are gas or tanks. The first we are not allowed to use, so we are left with the second. The tank may not, however, be able to effect such surprises as it did in the last war, because in another war, by the time it is obtainable in large numbers, not only are both sides likely to possess tanks but also efficient anti-tank weapons. Nevertheless, wire is no obstacle to it, and it can crush down the most formidable wire entanglements in a few seconds, and so replace the alarming wire cutting bombardment.

I will now turn to the main difficulties which the attacking troops are faced by in frontal attacks of penetration, for these are not examined in *F.S.R.*

The fundamental difficulty is continuity of advance, and this is restricted more through hostile flank pressure than hostile frontal resistance; for it is an interesting fact, and one of the highest importance, that in the last war the flanking angles of the salient formed by attempted penetrations, were normally 45 degrees, and never more. What does this mean? It means that the problem of penetration must be founded on a mathematical calculation involving the factors of the depth to be penetrated,

and the nature of the enemy's defences. These, bearing in mind the sloping inwards of the flanks of the attack at 45 degrees, will enable us to decide whether we have sufficient men for the required frontage of attack. If we find we have not, then it is suicidal to attempt to penetrate. Thus, in diagram 6, if A B, the depth of the enemy's defences, is five miles, then we know that the front C D to be attacked is ten miles. But to push a few men through at A is not sufficient, for the gap created must be wide enough to enable the exploiting forces to be moved rapidly forward, which means outside of hostile machine gun range. Such a gap must be at least five miles wide—E F. This will allow of a frontage two miles wide, namely G H, which is fairly free from projectiles,

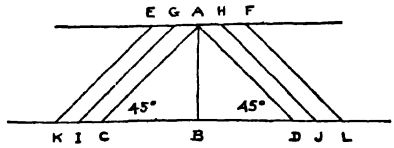

Diagram 6. Theory of Single Penetration.

and a considerable area, G I J H, also free to assemble troops in. Consequently we must add two and a half miles to each flank of the original ten miles frontage of attack, extending C D to K L. K L is therefore, fifteen miles.

Having worked this problem out, we must examine the enemy's defences, divide them into objectives, allot an attacking force to each, and decide upon what force we require for exploitation. Lastly, we total up these figures and see whether we have sufficient men. If we have not, then to attack is to court disaster. During the war scores of thousands of men's lives were thrown away, because it was not realized that the flanks of an attack of penetration slope inwards at angles of 45 degrees.

Not possessing the required number of troops, what

is the solution? There are two, namely, the dual penetration, and the tank attack. I will examine these in turn.

Granted that somewhere on the enemy's front there is to be found a salient—A B C, in diagram 7. Then, if two frontal attacks are launched from D E and F G, not with the idea of penetrating his defences on these fronts, but instead of rendering the area H E B F I untenable, this area will have to be evacuated, and by rapidly following up this evacuation a penetration may be effected along the line J K.

The difficulty in this method of attack is once again

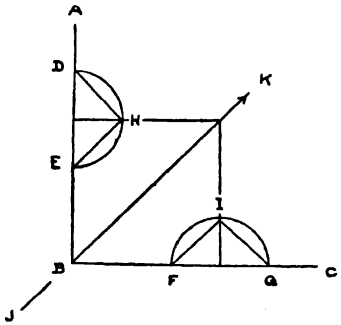

Diagram 7. Theory of Dual Penetration.

the large numbers of men required, because both attacks have to be made in strength, and sufficient strength to draw in large forces of the enemy, so that he is unable to oppose the advance along the line J K.

This method is in fact a makeshift, for it does not overcome the main difficulty, which is the sloping inwards of the flanks. If in place we could make these flanks slope outwards, how easy would the problem be. This is exactly what the tank enables us to do, because it is bullet-proof.

First, take the method of single penetration. The attack is launched, artillery protecting the tanks and the tanks leading on the infantry, which results in a deep

dent, or salient, being made in the enemy's line. As this attack begins to peter out, as it will after it has penetrated some 10,000 to 14,000 yards, the main tank attack is launched at follows: The tanks move off in three bodies, see diagram 8. The central one goes straight forward and passes through the front of the initial attack, the two flanking ones enter the dent and then wheel outwards and roll up the rear of the enemy on each side of it. What does this lead to? The automatic widening of the initial front in place of the automatic dwindling of the advancing front as the penetration grows deeper and deeper.

In the method of dual penetration this ability to push out the flanks reaches its maximum effect; because it

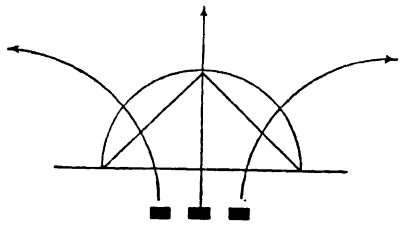

Diagram 8. Theory of Tank Penetration.

enables the two attacks to be separated by a far greater distance. The area threatened between the two attacks is also far greater; consequently the wound made in the enemy's defences is more extensive, so extensive that he is likely to bleed to death.

It may be thought that such tank attacks will be prohibitively costly. This is not so. Pause and think. Suppose that 500 tanks are used in the initial attack, and 1,500 in the main tank attack, and suppose that each tank costs £10,000 and further that every single one of them is eventually lost, then the cost will be £20,000,000. This is a little less than the cost of the preliminary bombardment which heralded the Third Battle of Ypres, a bombardment which so completely destroyed the artificial

drainage of the area to be attacked as to doom the battle to failure before a single infantryman clambered over his parapet.

To turn now from the method of battles of penetration to details, we are at once confronted by two great difficulties, the first is administrative, the maintenance of the forward movement, and the second is tactical—its initiation.

As regards the first it must be remembered that enormous masses of men are assembled not far from railheads, and are supplied by an elaborate system of road transport. Directly the move forward takes place, roads grow worse and worse, and even if a wide penetration is effected it will take some time to bring the railheads forward. As far as I can see the only practical solution to this problem is to be sought in cross country transport—vehicles which can dispense with roads or use exceptionally bad ones.

As regards the second, the difficulty begins with forming up. This can seldom take place in daylight, consequently it has to be carried out during hours of darkness, and the attack launched at dawn; for masses of men cannot be left in the open as long as the enemy has a single aeroplane in action.

Generally speaking, the attacking troops should not be drawn from the trench garrisons, for if they are great risk is run that a single successful hostile raid will divulge to the enemy what is about to take place. They should be passed through these garrisons from their forming up place to their starting line, all routes being taped so that the men do not lose their way. The whole movement may be compared to that of a ceremonial parade in slow time.

At zero hour, to the tick of the clock, a thousand guns will open in one stupendous crash, and hundreds of machine guns will add to the din which can be compared to no other sound on earth. The guns throwing down a barrage of shells in front of the infantry, a

barrage which slowly creeps forward a hundred yards in from two to four minutes. Meanwhile standing barrages are placed on the enemy's O.P's and communications.

In attacks of artillery and infantry, it is important to realize that the barrage is the firing line, and that the infantry are its supports, they confirm what the barrage effects. In that of tanks and infantry it is the same; the tanks are the firing line, and once again the infantry confirm what the tanks accomplish. If, however the enemy is to be kept on the run, this system of confirmation is not sufficient, either the infantry will have to be moved forward in mechanical transport, or the leading line of tanks will have to be supported by a reserve line. To keep the enemy on the move is the object of the attacker, and this is generally done by leap-frogging fresh troops through exhausted ones.

In attacks of artillery and infantry, when the barrage ceases, normally the infantry advance ceases. The difficulty of moving hundreds of guns forward and supplying them is one of the greatest; consequently, unless tanks are used, exploitation becomes almost impossible, and even if cavalry can move forward, the difficulty in feeding and watering them is likely more often that not to bring them to a speedy halt.

If the attack fails then it should not be pushed.

THE FINAL PHASES.

75. General Considerations.

The final phase of a trench battle is either the utter exhaustion of both sides or the rapid withdrawal of the defeated side and the slow movement forward of the victorious. Should armoured forces be in reserve, the attacker may well look out for flank counter-attacks, and the retiring enemy for a rapid pursuit. Counter-attacks of the old description, that is with the bayonet

are seldom possible in these days of the machine gun. A counter-attack, in the modern meaning of the word, is by fire and not by cold steel.

THE PURSUIT.

76. General Considerations.

Pursuits are the exception and not the rule, in spite of the fact that the object of the attack is seldom attained without them. The reason for this is, that at the conclusion of a battle the victor is generally as disorganized as the vanquished, and that unless he has a preponderance of force, such as the Allies had at Waterloo, Grant had over Lee in April 1864, and Lord Allenby had over the Turks in Palestine in 1918, he is generally unable to find a formed body of troops for this operation.

If tanks are not used by either side, then the breaking off of an engagement is not generally a very difficult task, because the machine gun controls the field, and as long as the beaten force can deploy a line of these weapons it is unlikely that it will be rushed. Consequently, in such battles pursuits will become rare.

As I have already explained in a previous lecture, pursuits are of two kinds—the direct and the outflanking, and the best results are gained by combining them, the first compelling the enemy to defend himself whilst the second attempts to get round him and cut him off.

On this point the *F.S.R.* are very clear; in them we read:

Direct Pursuit. "The main body of the force will take up the direct pursuit at the earliest possible moment, and will continue it day and night." But if the enemy can disengage, "a direct pursuit by the main body will rarely lead to decisive results."

Outflanking Pursuit. "The most decisive effect will be obtained if a large force of mobile troops, acting in

conjunction with aircraft, can place itself across the enemy's line of retreat at a considerable distance behind his battle front. Even a small force acting in this way may produce far-reaching results . . . . Armoured fighting vehicles will be of particular value in . . . . attacking formed bodies of the enemy and reserves. They will also have great effect if they can attack the hostile headquarters, and administrative centres, etc., and if they can seize and hold important points such as bridges and defiles . . . . Owing to its speed, circuit of action and the large quantities of ammunition carried, mechanized field artillery is particularly valuable in a pursuit."

These quotations will show quite clearly why we are really training for a war of mobility and not for siege warfare. Siege warfare is a phase and not an object. The object is continuity of movement. To say that one side may want to stop movement is true enough. This daily happens, but movement is only temporarily stopped by damming up a river, sooner or later the water will rise to the top of the dam, flow over it and gain impetus as it falls. Movement is only profitably stopped by counter-movement. Movement is the soul of war, but this does not in any way exonerate us from understanding what static warfare entails; for without this knowledge we shall repeat the mistakes made in the last war, and possibly at even greater cost.

LECTURE XI.

CHAPTER VIII. THE DEFENCE.

77. General Principles.

In most minds the idea of defence pre-supposes weakness; often this is true, but by no means always so, for the offensive-defensive is frequently the stronger form of attack. Briefly, its aim is to induce the enemy to attack when the advantages of ground and position are against him, and then when he has become involved to attack him in turn.

Caution is the true base of audacity—something held firm, like a bow, from which audacity, the arrow, speeds its way.

There is also what is known as the "defensive order," which is in fact the foundation of all offensive operations. The secret of many of Napoleon's successes is to be discovered in it; he clearly expressed what he means by it when he says: "The whole art of war consists in a well reasoned and extremely circumspect defensive followed by rapid and audacious attack."

In the Grecian phalanx this order is to be discovered in the depth of its eight to sixteen files; in the Roman legion, in the depth of its four-fold order of troops. In Alexander the Great's order, we find the defensive centre, the phalanx, from which his left and right wings swing backwards and forwards; in Frederick the Great's order the defensive front and the offensive flank, and in Napoleon's lozenge, the defensive distribution, which enables any one of his corps to become a holding force, a pivot for the rest of his army to move upon.

There is a defensive strategy and an offensive tactics,

such as Hannibal's, and an offensive strategy and a defensive tactics, such as that of his great opponent Fabius. In brief, defence is as closely related to the offence as is the left arm to the right arm of a boxer. The attack protects the defence, and the defence the attack. A one-armed pugilist is not a formidable antagonist, neither is a general who assumes a passive defence, or who attacks *à outrance,* that is all out.

In *F.S.R.* the defensive is largely considered as a thing apart, and as the action of the weaker side—the occupation of a hastily organized position, or the occupation of a well organized one. In both cases the underlying principles are much the same, namely:

(a) The distribution of weapon power to ground. The smallest possible force being used for the defence, and the largest possible kept in reserve.
(b) The distribution of the defensive troops in depth, so that the resistance may be flexible and prolonged.
(c) The protection of the flanks and rear, and possible lines of approach to the enemy's flanks and rear when he attacks.

If the defence is assumed in order to avoid battle, then the position selected should be difficult to attack; if to invite battle, then it should cover some object of vital importance to the enemy; if to attack from, then its forward communications and the nature of the ground should favour the offensive.

78. Choice of a Defensive Position.

We now arrive at a series of sections in logical order, namely:

(a) Choice of a defensive position.
(b) Preparation for defensive action.
(c) Organization of defence.
(d) Occupation of defensive positions.
(e) Ultimate offensive action.

The first must at once be referred to the last, for choice depends on the ultimate object. Is the position one to manoeuvre from, or to hold, or to attack from? This makes a considerable difference.

Secondly, it depends upon what arms we possess, and what arms the enemy possesses. If we are strong in tanks and he is weak, the position must favour the tank counter-attack. If we have no tanks and he has, then it must favour anti-tank defence.

Thirdly, the position should offer good rear and lateral communications. The second are particularly important in order to effect surprise. A good main road running from flank to flank, behind the position will enable force to be shifted rapidly from flank to flank, or flank to centre, or centre to flank. It will, consequently, constitute a means of surprise.

Now as to the position itself, there are four factors to consider:

(a) The vital points, or vital areas.
(b) The localities which defend them.
(c) The artillery observation posts.
(d) The anti-tank obstacles and approaches.

I shall examine these later on, when I come to Section 80. Here I will turn to the key of this problem—ability to see, that is to observe fire. This key will at once unlock the problem as to whether the infantry should occupy a forward or a rear slope. Can the forward slope be observed from the enemy's O.P's, and can any dead ground in front of it, or tank approaches leading towards it, be observed by our own O.P's? If the enemy's powers of observation are indifferent, the forward slope fairly steep, and the dead ground in front of it of no great danger, then, as long as the approaches to it are well concealed, frequently a forward slope is advantageous.

Salients we are told " constitute a source of weakness owing to the facility with which converging fire can be brought to bear on them." This is true in many cases

when salients are formed by pronounced natural features; nevertheless, defences generally should be laid out in salient form, just as the old medieval castles and later enclosed fortresses were. The position should possess its machine gun bastions flanking its wire curtains, so that an enemy approaching these ramparts may be caught in flank. Advanced posts we are also told are a weakness. This is so if by a post is meant a small defended locality; but if these posts are placed on a mobile footing, that is if armoured cars or armed motor cars are posted on the roads and approaches, then I consider that these look-out stations are essential to the defence.

Depth of defence is important for reasons I have already discussed in my last lecture, namely, that the flanks of an attack slope inwards at angles of 45 degrees. Consequently, should the enemy not be using tanks in large numbers, if the total force he can attack with is known, it is actually possible by deepening the defences to create what to all intents and purposes is a zone impregnable to frontal attack. In the defence, depth may rightly be considered to be the foundations upon which initiative rests.

Finally, to return to my starting point—the counter-offensive, the *F.S.R.* are not altogether clear on this subject. They lay down that "the ground in front of the position must be suitable for the assumption of the offensive," and then a little later on they state: "The most favourable ground for the ultimate assumption of the offensive is that which lends itself to envelopment of the hostile forces." In which case it is obvious that it is not so much the ground in front of a position which matters, but the ground on its flanks.

79. Preparations for Defensive Action.

As the defence causes a temporary cessation of mobility, reconnaissance becomes all the more important in order to ascertain the use the enemy is making of

his own mobility. Consequently, not only should his forces be kept under constant observation, but a network of posts should be thrown well out, from which patrols can work backwards and forwards. It is for this reason that I have suggested the use of armoured cars and armed motor cars—the former normally establishing the posts and the latter the connecting and reconnoitring patrols.

In these reconnaissances the main point to discover is the enemy's intention: Does he mean to advance on the position, or to turn it, or to mask it? The general strategical and tactical situation will undoubtedly give some inkling, and this may be corroborated if the patrols operate with boldness and capture prisoners. If motor cars are used this should not be difficult to do by means of well laid ambushes.

As regards reconnaissances, I have frequently seen hours and hours wasted for lack of method. To take an infantry brigade for example: The Brigadier should first examine his map and not the ground; divide the defensive area into battalion sections, fix the boundaries, and then at once send out the Battalion Commanders to reconnoitre, telling them that at such and such an hour he will meet them on the boundaries, and will then co-ordinate the defence of the inner flanks. The Battalion Commanders should act towards their Company Commanders in a similar way. Normally, everybody wanders round everybody else's front, which is quite unnecessary. The Brigadier's main job is the battalion flanks and his own outer flanks; the battalion commander's—the company flanks and the machine gun and anti-tank defence. Should the Brigadier be given artillery, then the gun positions equally concern him. When all these things have been done, if time suffices, a general ride round can do no harm.

Turning to the defences themselves, trenches and wire entanglements play the leading part. They not only protect the defenders, and delay the enemy, but, if carefully sited, they should enable a commander largely

to reduce the number of men and weapons required for the defence, and so strengthen his reserves.

Of obstacles there are two types—barrier obstacles and deflecting obstacles. The first are used to block a direct advance, and the second to divert it. Both are of little use unless covered by fire. Thus in diagram 9, fig. 1, trench (a) covers barrier (b), and in fig. 2, an enemy striking obstacles (c), unless he can cut through them, will be diverted towards (d), and there come under fire. Deflecting obstacles, which were not made much use of in the last war, are most effective as they introduce the element of surprise.

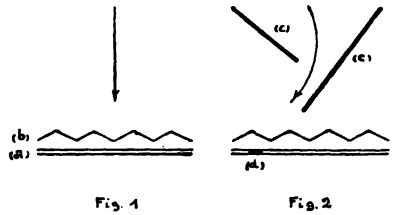

Diagram 9. Barrier and Deflecting Obstacles.

80. Organization of Defence.

In the organization of a defensive position, the first thing to decide upon is: What points are vital to the security of the object? Should it be to prevent an enemy from occupying a stretch of high ground, then this high ground itself will become a vital point; should it be to block a defile—then the heights overlooking it; or if it is simply to delay an enemy—then the artillery O.P's. Generally speaking O.P's and vital points coincide.

These points should, whenever possible, be placed in a state of defence, for they represent the keep of a castle, and as a keep is defended by outer walls and bastions, so they should be. Their outer line, or circumference, of defence is called the foremost line of defended localities. It should be sufficiently far forward to prevent the vital

points coming under small arm fire, and sufficiently close to be easily protected by the artillery detailed to support it. This foremost line is not so much a line as a chain of mutually supporting posts, from which machine guns and light automatics can bring enfilade and cross fire to bear upon an attacker. In front of this foremost line, and for purposes of observation only, is established an outpost line, which on the enemy's approach must retire into the localities so as to clear the front. Theoretically the general outlay is shown in Diagram 10.

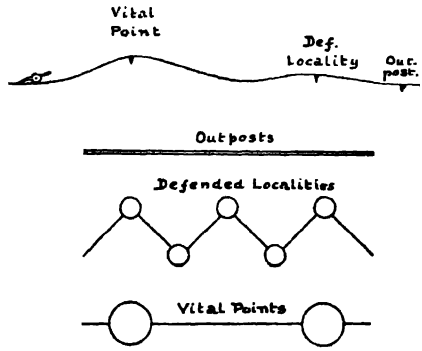

Diagram 10. *Organization of Defence.*

81. Occupation of a Defensive Position.

On occupying a defensive position a commander must at once remember that he will have to hit as well as to hold, consequently his first problem is to decide upon the division of his force into two bodies—defenders and reserves, these may again be compared to the left and right arms of a boxer.

Having decided upon the extent of his front, he will divide it into tactical sectors, and allot to each sector a definite body of troops, taking care not to break up unit organization; for nothing is more provocative of friction than the allotment of units of one command to another. Sometimes, however, in the case of machine

guns, this is unavoidable. Where internal flanks join up, special care must be taken that it is perfectly clear which of the two units is responsible for their security; and for external flanks special support will usually have to be provided.

Rear protection must also be considered should there be any likelihood of the enemy turning the position, and if he is equipped with tanks it becomes of the utmost importance to select the foremost line of defended localities with reference to them, and when a river or stream can be found, such an obstacle will prove invaluable; failing this, broken ground which can be observed and which does not offer covered approaches.

Outside natural and artificial obstacles—such as deep trenches and mine fields, anti-tank defence may be organized in three ways:

(a) Tank counter attacks, which I will examine in the next section.

(b) Artillery: If the field batteries are well to the rear as they normally are, then a forward anti-tank position to which guns can be sent up directly enemy tanks are reported advancing must be reconnoitred. As this move will take time, the nearer the guns are to this anti-tank position the better.

(c) Anti-tank weapons, such as anti-tank machine guns, should normally be kept mobile, that is in reserve, and a number of alternative positions for each gun reconnoitred. If at the outset of an attack these weapons are in position, they may come under such heavy fire as to be difficult, or impossible, to shift. The positions selected should be such, that, when occupied, the fire of the anti-tank weapon will drive the enemy tanks into areas in which tank counter-attacks can be launched against them.

The position of the general reserve, depends mainly on the nature of the ground, the direction of communications and the nature of the weapons used. Generally speaking, the defensive position itself should be so sited as to deflect the enemy towards one flank. This is more particularly important, if the defence is of a temporary nature. Should this be done (see diagram 11), and the enemy can be persuaded to attempt an envelopment, then the general reserve should be placed behind this flank ready to strike the enemy in flank as he approaches.

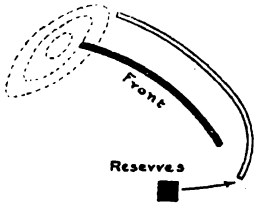

Diagram 11. *A Deflecting Position.*

82. Counter-attack and Counter-offensive in Defence.

A counter-attack is a driving back operation, and a counter-offensive a driving forward one; the object of the first is to restore a position, to gain back something lost, and of the second to change a situation, definitely to abandon the defensive and assume the offensive. Thus, at the battle of Ligny, when Napoleon had exhausted the Prussian reserves, he ordered d'Erlon's column forward to turn Blücher's right flank, and attack him in rear.

Counter-attacks are of two types—immediate and deliberate. The first are generally quite small affairs; the forcing back of an enemy who has penetrated the foremost line of defended localities. They should be delivered in the shortest possible time with the greatest audacity, in order to take advantage of the disorganized state the

enemy will be in. Generally speaking, they should not be attempted, as daily seen during peace training, by a bayonet charge, but by opening intense machine gun fire on the locality in question, and advancing riflemen under cover of this fire.

To be prepared for these counter-attacks, directly a locality is occupied its commander should decide upon a series of simple counter-attack plans, such as—alternatives A, B and C. His reserves, the eventual counter-attacking force, should be practised in these, so that, should any one have to be carried out, all the commander need do is to fall in his men and shout " Alternative A," or whichever it happens to be. I have seen this done in peace time with marked effect.

A deliberate counter-attack in no way differs from an ordinary attack, except that it follows upon an attack. It is an operation of all arms, and when possible should be launched against the flank of the enemy's forces.

For counter-attacks, if careful preparations have been made, tanks are by far the most effective weapons. These preparations should consist in taking a map, or a large scale sketch of the whole defensive position, dividing it into squares—A, B, C, D, etc., and reconnoitring the approaches leading into each square from those adjoining it. The tanks held in reserve in a central position will then be able, on the alarm " enemy have entered D," to move at once to the counter-attack in this area. These attacks should be immediate and no time should be lost in attempting to establish co-operation with the defenders of D.

83. Infantry in Defence.

The necessity of infantry holding on to the localities they garrison is all important, because, if driven out of them, the creation of an internal flank, or gap, may lead to neighbouring localities being attacked in rear. When infantry are driven back, it must be recognized that generally speaking they are quite valueless as fighting

troops unless they can occupy a rear system of defence, when immediately their morale is revived. This being so, it is important that, when time permits, forward localities should be supported by unoccupied reserve ones in rear.

To push up fresh troops to reinforce demoralized ones is worse than useless, because the chances are that they in their turn will be thrown into disorder. Instead, they should be moved to a flank of those falling back, and should counter-attack the enemy in flank as he pushes forward. They must be hinged on to something solid and not floated on to something fluid, so that they may work from a firm base of action. When a door is torn off its hinges, it is useless to slam it; instead, step aside, and, protected by the wall, attack in flank any would-be intruder.

84. Artillery in Defence.

The object of artillery in the defence is to bring the maximum fire down in front of the foremost line of defended localities; to search dead ground, and to afford flank protection. I will repeat it again, should the enemy be likely to use tanks, then for anti-tank purposes artillery is quite useless if much more than 1000 yards in rear of the positions attacked. Considering that one machine gun on the defence can frequently hold up an entire infantry brigade, and that an infantry brigade in the defence may easily be overrun by a company of tanks, it appears to me only logical to suggest that when the enemy is strong in tanks the bulk of the defending artillery should be forward.

The nature of the various types of fire used is given in paragraph 5, of which counter-preparation and anti-tank fire are in my opinion, the most important. "Counter-preparation is co-ordinated artillery fire, directed against the enemy's probable forming-up places and forward communications, and is put into operation when an attack is anticipated."

85. Cavalry in Defence.

Cavalry, we are told, should "be concentrated in a position which will give them full scope for co-operation in the decisive phase of the battle." What is this position? I cannot say, unless it is the entrance of a railway tunnel, unknown to the enemy, which will enable them to pass beneath the battlefield and attack the enemy in rear. With such a God-sent gift and an electric torch or two, I admit that a Jeb Stuart operation may still sometimes be possible.

In my opinion, most of this section belongs to eighteenth century warfare. Cavalry are practically valueless in the defence, except for reconnaissance and advanced post work before the battle begins.

86. Engineers in Defence.

The whole of this section is clear sailing, and boils down to this: In defensive operations engineers have so many special tasks to carry out: such as demolitions, road making, dug-out construction and water supply, that for all other work the combatant troops must rely upon themselves.

LECTURE XII.

CHAPTER VIII. THE DEFENCE.

FURTHER CONSIDERATIONS IN PROTRACTED DEFENCE.

87. Special Conditions.

Sections 87 to 95, fifteen brief pages, deal with a problem which held our attention for four long years during the last war. A problem which was a stupendous one, and concerning which only a sketch is here attempted. It is a problem which, in another war, every nation will wish to avoid. It was a problem which, in 1914, no army was prepared to solve, and one which to-day no army is any the better prepared for.

This problem was created by the rifle bullet in the Crimean War of 1854, the Italian war of 1859, and above all in the American Civil War of 1861-65, which may be considered as the first of the great rifle bullet wars. What were its peculiarities—trenches and slaughter. Nearly every battlefield was entrenched and over half a million of men perished. The next series of wars, those fought in 1866 and 1870 saw trenches, but not so many. Then, in the Russo-Turkish war of 1878, they reappear. In 1899-1902, in our South African War, they are replaced by block-house lines, and in the next conflict, the Russo-Japanese War, 1904-05, practically every battlefield is entrenched and most are wired.

The rifle bullet created the trench, the trench cried

out for wire, and in the last war, between 1914 and 1918, to overcome trench and wire supported by fire three means were used—the gun, gas and the tank. The first failed, the second was countered, and the third succeeded ; because the only practical answer to half an ounce of lead is half an inch of steel. This would seem obvious, but to many it still appears to be no more than a senseless platitude.

The bullet halts the man, that is a man on the defence is endowed with a far higher offensive power than a man in the attack who cannot fire until he lies down, that is assumes a defensive attitude. In the American Civil War it was calculated that one man on the defence was equal to from three to five men in the attack ; and this was in the days of the muzzle-loading rifle. Consequently, since the introduction of this weapon, in offensive power the defence has steadily grown stronger and stronger than the attack. The Achilles' heel of the defence is, however, lack of movement. The defender is tied down to a position whilst the attacker is not. The strength of the attacker lies in the fact that he can change his position, that is he can manoeuvre. If he cannot or will not manoeuvre then he has no option but to deliver frontal attacks, in which the rifle and the spade always beat the rifle without the spade ; consequently the attacker takes to the spade, and when spade and rifle meet spade and rifle there can be but one result—fortress, siege, position, static, protracted or trench warfare, it has many names.

The offence is now handed over to the artillery, because gun fire can cut wire and demolish trenches. When defences are shallow and guns are multitudinous, the gun can still sometimes beat wire and spade; but when defences grow in depth, in the end wire and spade inevitably beat the gun, and in the last war this happened in the year 1916.

As defences grow stronger and deeper, fewer and fewer men are required in their forward zone, which

becomes a lightly held outpost line behind which strong reserves are massed to counter-attack any attempted break through. Such, in brief, are the main conditions of the protracted defence, to the organization of which I will now turn.

88. Organizations for Protracted Defence.

Once a front can neither be turned nor broken, as happened in France from November 1914 to October 1917, the true battle is shifted to the industrial areas; here lie the reserve forces which will ultimately win the war. This is what happened during the last war, and is likely to happen during the next; consequently, unless some totally new method of war is devised, or some weapon of novel powers is invented, the main military strength of a nation will continue to lie in its power to manufacture. If industrial centres can be so heavily bombed that their output is seriously affected, or if by submarine attack the raw material they require can be denied to them, these rear attacks, which entirely ignore the battle front, may have such an enormous influence on the economic and moral foundations of a war as to bring it to an end.

These methods of attack are rightly not considered in this chapter, as they are not tactical means of waging war; yet it is a little bewildering to find practically no mention of the tank and the defence to be adopted against it, for it was this weapon which in the last war solved the problem. This being so, I will begin by setting down a few ideas on this subject.

The tank is a moving fortress, or it might almost be said—a mobile entrenched line, like " Great Birnam wood to high Dunsinane hill shall come against him." How can this armoured line be stopped? It can be stopped as a battleship is stopped, by a land fort. Therefore, I am of opinion that when it is recognized that tanks are the one and only effective weapons in a trench attack, the

defences are likely to pivot on the problem of how to stop and how to destroy the tank.

This problem even if dealt with briefly would require a lecture of its own. Here, I can only outline a few salient points. Failing a definite tank obstacle, like the river Meuse or Rhine, defences will have to be artificial. These, omitting inundations, may be divided into three categories :

(a) Anti-tank weapons—guns, machine guns, mines and tanks.

(b) Barrier and deflecting trenches.

(c) Anti-tank forts.

To begin with the third. Anti-tank forts are not likely to be placed within the effective zone of the bulk of the enemy's artillery, but when possible just outside it. They will consequently be sited well in rear of the forward zone of defence. This will mean that unless the garrisons of this zone can halt the attacking tanks, or gain time to effect a withdrawal to or beyond the main anti-tank defences, they run a serious risk of being annihilated.

Wire will not stop a tank ; mine fields are extremely dangerous to the garrisons of the forward zone, they limit tank counter-attack and are liable to be destroyed by gun fire. Consequently, I think that reliance will have to be placed on barrier and deflecting trenches, as well as upon wide and deep communication trenches which will simultaneously facilitate withdrawals and act as anti-tank obstacles. What form will these trenches take, for though the Vickers tank has a small span, only six feet, in the last war, by means of fascines or cribs, tanks could span as much as eighteen feet. I think that in place of veritable canals they will take the form of rows of slits about ten feet long, three to four feet deep and two feet wide joined by V-shaped trenches, in fact long graves in which the tracks of the tank will get buried

(see diagram 12). Three or four rows of these graves laid out in a diamond pattern should prove a formidable obstacle unless a pronounced zig-zag course is steered across them. This in any case will consume time, and offer favourable targets to gun fire.

To return now to the forts: They should be either concrete works sunk in the ground, or small deeply entrenched earthworks, armed with one or two anti-tank machine guns and a field gun. These works should be so sited as to allow of concealed anti-tank counter-attacks being carried out between them by tanks against the enemy's advancing machines, and the mine fields should be so placed that these counter-attacks have a good chance of driving the enemy tanks into them. In the

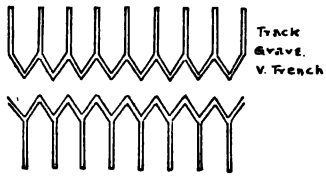

Diagram 12. *Anti-tank Trench.*

neighbourhood of these mine fields should be constructed small anti-tank forts, well concealed, which can open fire upon the enemy tanks directly they get into trouble, and from which a flag can be hoisted to warn our own tanks that they are approaching a mined area.

I hope you have now got my idea, which is this: If at the opening of a war one side is strong in tanks, and the other is weak, there is a chance of trench warfare being avoided. If both sides are weak, trench warfare will follow. If trench warfare is prolonged, it is not by any means unthinkable that the defence will beat the tank, more especially so should we have carefully thought out the anti-tank problem beforehand, and are mentally prepared to construct effective anti-tank defences directly trench warfare begins. This will never be done if this

subject is neglected in *F.S.R.* To me it is an amazing oversight, that though in this part of *F.S.R.* infantry, artillery, engineers and even cavalry are considered with reference to the "protracted defence," tanks are not; and that the only mention of anti-tank defence is that it will be organized. How? this is what the soldier wants to know. It is useless saying, "the baby will be called 'John,'" if we refuse to beget one.

To return now to pre-tank warfare, nineteenth century warfare, which unfortunately for the exchequer we must still be prepared to wage.

Defensive zones are organized the same throughout. Each zone consists of an outpost system, a system of defended localities, and the main position which may be compared to the vital points in the field defence. When the enemy is about to attack, that is when he opens his wire cutting bombardment, the garrisons of

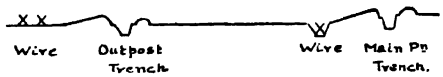

Diagram 13. *Concealed Wire.*

the outpost line should be reduced to a minimum, if not evacuated altogether, and those of the defended localities, should they come under heavy gun fire, must be protected. This introduces two problems—the protection of wire and the protection of the garrisons.

During the war very little wire was trenched, and most of the entanglements erected were of the barrier type. When the field attack originally halted, trenches were dug and were seldom looked upon as temporary defences to cover the construction of permanent ones behind them, but were turned into permanent ones themselves. Had the reverse process taken place, half a mile or so behind the outpost line, it would have been possible to sink the bulk of the wire in trenches, see diagram 13, and consequently have rendered it far more difficult to cut or to observe from the air.

As regards the protection of the garrisons, little by little the deep dug-out came into use. There was nothing wrong with this type of shelter except that normally it was provided with two entrances, both leading into the same trench. I remember, in 1916, suggesting to the Chief Engineer of an Army, that a dug-out like a house should have a front door and a back door, and that the back door should not be in its front. He, however, could not see my argument, consequently I explained my idea more fully and said: "The fire trench is a good place to be in during the daytime, because you can see from it; but at night time it is a poor place, because you cannot see very well from it, and if a raiding force enters it you

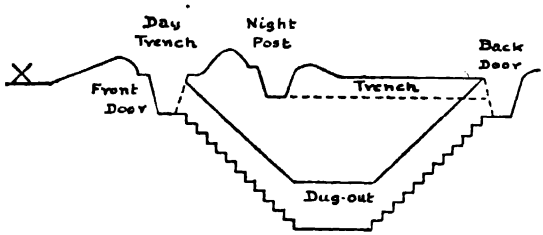

Diagram 14. *Back-door Dug-out.*

may be taken in flank, and the men in the dug-outs can all be 'hands upped' if the back door is a few yards on the right or left of the front door; therefore, why not evacuate the fire trench and have a real back door." He thought I was quite mad, so I continued: "If you agree to such a kind of back door," which he most certainly did not, "then its stairway should lead into a small covered trench dug from its outer entrance to a rifle pit constructed immediately behind the parados. At night time the fire trench (see diagram 14), can then be evacuated, and will become a dry moat, an obstacle, its garrison can retire to their dug-out and shut their bomb-proof front door, and a sentry can be posted in the rifle pit. When a raid comes along the sentry

presses an electric button which rings a bell in the dug-out; the garrison debouch from the back door, line up behind the parados, and, when the raiders come along, all they do is to cry 'hands up.'" Is there anything wrong with this suggestion? Yes and no. Yes, in 1916, for it was not included in the *Manual of Field Engineering*; no, in this present year of grace, because it is. Anyhow the Chief Engineer was totally unconvinced.

We are told towards the end of paragraph 3, that "there is only one degree of resistance for the troops," which in section 77 is defined as "to the last round and the last man." Were armies recruited from Argonauts, this would be an admirable precept to follow; but I have in France seen so many taverns and inns called "La Dernière Cartouche" that I have come to the conclusion that in war there is a good deal of running to the next cover, if not to the next pub. Consequently, if it is of the utmost importance that a position should be held to the last man, it is not sufficient to rely on the theory of the last round; but to see that these localities are all but impregnable. They should be flanked by fire, have deflecting obstacles leading up to them, be surrounded by anti-tank trenches, and be provided with back-door dug-outs.

As the *F.S.R.* very rightly insist upon, the secret of all defensive work is to be found in depth, and this is just as true whether tanks come into the picture or not. Depth depends on time, and in the last war we wasted millions of man-hours upon forward work which would have been far more profitably expended on deepening the rear systems.

Within a defensive zone, frequently depth can be more readily obtained, not by lines of trenches but by groups of localities, united by communication trenches which themselves, if so constructed, can also be used as fire trenches. When a bombardment on a localitiy takes place, the garrison can man these and then return to it when it ceases; but if the bombardment is followed

by an attack it must of course remain in the locality itself.

This linking up is important, not only because it enables rapid reinforcement and covered withdrawals, but it bewilders an enemy and also reduces the feeling of isolation among the garrisons. The upkeep, however, of a large number of trenches is always difficult, and during the winter months, when attacks are not so likely, as many trenches as possible should be closed to traffic and repair. In one fine week of spring weather more repair work can be done than in weeks of rain, slush and frost.

Finally, all wire entanglements should be tactically sited, alternative positions should be prepared, and for every sector, or locality, a plan of defence should be worked out, all sector plans fitting together into a general plan for the entire front of the formation concerned.

89. Counter-attacks in Protracted Defence.

In trench warfare counter-attacks should normally, as in field warfare, be carried out by fire. Small immediate counter-attacks should be practised on the alternative system which I have already explained. Deliberate counter-attacks should be initiated from the main position, and, should tanks be used, the area immediately in front of it should not be encumbered with trenches, for such counter-attacks require an open sweep of ground.

90. Infantry in Protracted Defence.

The object of wire and earthworks is not only to protect the troops allotted for the defence, but to enable them to be cut down to a minimum. As regards infantry, this can be done by fashioning the defences round the machine gun and the light automatic. To maintain observation by day and night is of course essential, and to patrol at night is equally so; but if Lewis guns are used for frontal fire and machine guns for flanking fire,

a comparatively small number of men can hold quite an extensive frontage. This is not only important from the point of view of increasing the reserves and of reducing casualties, but of maintaining the trenches in a state of repair.

91. Artillery in Protracted Defence.

In the defence of an entrenched position the main object of artillery is to bring fire down on the front of the position attacked in order to destroy the attacker or to isolate him by what during the war was generally called a box-barrage. It is important to conceal the batteries, though normally this is impossible, and still more important is it to maintain secret the localities upon which the defensive barrages will fall.

92. Cavalry in Protracted Defence.

The information given in this section properly belongs to the age of the armoured knight. If the words "cavalry" and "horses" are replaced by those of "men" and "tanks" in the following sentence: "The separation of cavalry . . . from their horses, and their employment as weak bodies of infantry, lead to the loss of opportunities for mounted action at a time when their mobility as a mounted reserve may be of the greatest value"—then I full-heartedly agree; otherwise I am of opinion that in this type of warfare cavalry have no place outside that of mounted police in the rear areas.

93. Engineers in Protracted Defence.

As in the field defence, except for special work, such as constructing mined dug-outs, concrete emplacements and trench railways, the engineers should not be employed upon any work which the infantry, etc., can carry out for themselves.

The entire planning of the defensive system should, however, be worked out by the Engineer-in-Chief and

his staff, and should not be left to the formations which garrison the defences, for they are but temporary residents. If left to them, a chaos of work will result. During the war, in one small brigade sector, I remember no less than seven different brigade headquarter dug-outs being constructed by an equal number of temporary and truculent tenants.

94. Information in Protracted Defence.

The acquisition of information in the defence is an elaborate subject of its own, depending on air photography, flash spotting and sound ranging, etc. As regards the fighting troops information is gained by means of observation posts, patrols and raids. No unit in a front line trench should remain satisfied until it has ascertained the identity of the unit opposed to it. This is best done by a raid.

95. Reliefs in Protracted Defence.

Not only are frequent reliefs essential for rest and training, but also for hygienic reasons, and in order to maintain the morale of the troops. There is much detail in this section, and all of it is clear sailing, so I will only consider one point, a point of some importance, namely, how to discover a falling off in the morale of a trench garrison. Watch the morning sick return of each unit, as they go up it will be found that morale is going down, not because men are really falling sick, but because they are trying to escape from the trenches by pretending that they are unwell. When this happens it is time to relieve a unit.

DISENGAGEMENT.

96. General Principles.

As already mentioned in a former lecture, on account of the enormous stopping power of the bullet and the

range of artillery, disengagements, if carried out by night, are not dangerous operations ; but they require high grade staff work. In 1917, the Germans retired to the Hindenburg Line at their leisure. In Gallipoli we did much the same. In March, 1918, we never succeeded in disengaging ourselves from the Germans until we were told to sit down. The main reasons for this were, that we were not prepared for their attack, though we knew that it was coming. We were surprised with our eyes open, having arranged no rallying positions in rear or collected reserves. If this were not bad enough, when the crash came, in place of army, corps and divisional headquarters pushing forward to show their colours and stem the retreat, they fell back dragging tens of thousands of men after them. I happened to be an eye-witness of this event, and can only say that disengagement was impossible because of the gross ineptitude of most of the commanders and their staffs. They had become so saturated with trench mud that they could think in no other terms but getting back and digging trenches. It was not until, on the advice of a junior major general (a substantive major), G.H.Q. issued an order for the various headquarters to halt, that the retiring front was once again stabilized.

Nobody knows for certain what is going to happen in battle. Disengagements and withdrawals often occur, and must frequently occur in mobile warfare. The commander who is unprepared for them will one day be inevitably caught on the hop. The last man and the last round theory is a frail reed to lean upon, but forethought is a girder of steel.

LECTURE XIII.

CHAPTER IX.

NIGHT OPERATIONS.

97. General Principles.

Night operations are of unusual interest, because they may be defined as unnatural operations. Night is the time to rest in and not to fight in, and to fight during hours of darkness is as unnatural as to sleep during hours of daylight. All the great captains have recognized this abnormality, and from Alexander to Napoleon they have one and all looked upon night work as the exception and not the rule.

Night operations pre-suppose a weakness or a difficulty, and before they are contemplated every other source of action should be explored. In war, these operations are the last resort, and not, as often is the case during peace time, the first suggested. It is a fact of importance to remember that whilst during war time night operations are seldom heard of, during peace training they constantly come bubbling to the top. Before the outbreak of the last war, in order to avoid the bullet, night operations were frequently mentioned; to-day, for a similar reason, without half the justification, they are again suggested, and this in spite of the fact that we know that the power of the bullet can be reduced to zero by a sheet of steel.

Successful night work depends on constant training. *F.S.R.* rightly stress the importance of cultivating a "night sense," but this is by no means an easy thing to do, and

certainly cannot be accomplished by carrying out a night exercise now and again.

On this subject I feel that I can speak with some authority. During the last six months of the South African War I was an Intelligence officer, my duties being totally different from those of similarly named officers during the last war. I was in command of two white intelligence agents and some seventy Kaffir scouts. Fifty per cent. of our work was carried out at night. Frequently we rode out forty or fifty miles during the hours of darkness, laid up during the day time in a spruit or pan, and when we had discovered the enemy's whereabouts we would work our way home. I remember leading columns of mounted infantry out during the night time, and have often watched a commander who fearing nothing in the daylight at once become obsessed by a semi-supernatural dread. The darkness not only isolated him from his men, but isolated his nerves from his reason. He was thrown back upon the primitive instinct of fearing that which is most hidden. His mind would become the play-field of ghostly forms ; he would see shadows and the glimmer of matches, and hear distant voices and the sound of hoofs. His men would bunch together to gain the tangible support of their comrades, and this also, I think, unconsciously affected his nerves. Darkness brought out his weaknesses, and now and again when a sleepy horse stumbled there was a start, a turn in the saddle and an anxious " What's that ? "

Night, when it is unknown, gets on men's nerves, but when known, that is when a " night sense " has been cultivated, it endows a man with the greatest confidence in himself, because he realizes how difficult it is to be hit and how easy it is to defeat danger by vanishing into the darkness. I can frankly say that when working with Kaffirs, who are never very reliable, I often felt anxious during day time, but at night time I never felt that anything really could have gone wrong. It never did; yet had it, all we should have done would have been to scatter in

all directions, and either meet again at some pre-arranged point, or work our ways home independently.

The one and only anxiety was finding one's way. I soon discovered that Kaffirs are wonderful guides as long as there is the slightest track to follow, but often hopeless when such does not exist. I knew nothing more of astronomy than the average school-boy, but I soon realized that by taking any easily recognizable group of stars rising in the east shortly after sunset, and by a rough calculation as to where it would be hour by hour, it was quite easy to find one's way. At one time in the year Orion's belt was my closest friend. What with the stars, some feature as a river or road in one's rear running at right angles to one's line of advance, as well as the fact that directly a farm was struck the Kaffirs could pick up a track, I only once out of at least fifty night expeditions remember losing our way. This occurred as follows: We had been marching on a search-light working on a railway some thirty miles north of us; we lost it behind a dip in the ground and picked it up again half an hour later. Unfortunately it was not the same light we had seen, but one miles to the south-east of it. The night was clouded over and the stars could not be seen; then Orion's belt suddenly gleamed through a fleeting cloud gap, and I at once realized what had happened. This mistake took us at least ten miles out of our way. It may be said: "Why not use a compass?" True, but I had not got one. I had given up carrying one, foolishly no doubt, because I had found that on several occasions on account of ironstone compasses were very unreliable.

In the last war, night operations, except for purely logistical purposes, consisted mainly in raids. I have never taken part in such work, but I can say this: that through constant practice, the Australian troops cultivated a wonderful "night sense." Their raids seldom failed, and consequently became the terror of the Germans opposed to them.

Night operations are undertaken for three purposes: surprisals, the avoidance of the bullet, and the shifting from one position to another.

As regards the first, the would-be surpriser, unless he possesses a "night sense," may easily be surprised; as regards the second, with the normal regular soldier formations must be kept closed up, in spite of the fact that if they come under machine gun fire, fifty men may be struck down in as many seconds. With anything like a large force of men, the third can be considered as the sole normal night operation, and one of increasing importance on account of the growing use of mechanical transport and armoured machines.

Though simplicity is not a principle of war, for night operations it is as well to consider it as such. The plan should be simplicity itself. No converging movements should be attempted unless inter-communication can be kept up, which is more often than not impossible. Changes of direction should only take place at easily recognizable land-marks. Reconnaissances I will deal with when I examine section 99. Concealment from enemy air observation before starting is all important; but observation can be used as a ruse by marching in the wrong direction a little before dusk.

Night operations fall into three classes: night attacks, night approaches and night withdrawals.

NIGHT MOVEMENTS CARRIED OUT BEHIND PROTECTIVE TROOPS.

98. General Considerations.

Such movements may be considered as normal. They affect reliefs and the shifting of troops. When motor transport is used, the main disadvantage is that headlights frequently cannot be switched on.

99. Conduct of Night Marches.

A night march is a day march in darkness, and the difficulty is not only to see but to see correctly. I have already in a former lecture mentioned the absurd incident of the Battle of the Loop, when two patrols got on to a circular railway siding and could not get off it. Walking in circles is anyhow a very easy thing to do during night time, and usually the soldier circles round to the left. Whether this is due to being taught to step off with the left foot I do not know, yet it is an undoubted fact. As regards seeing things correctly, I remember once in South Africa passing a lot of white stones. As I neared them on my return journey they got up and ran away—they were not stones but sheep! Had their position as a landmark been important, and had they moved after I first passed them, on my return I might have been searching for them half the night.

Reconnaissance for night operations is essential, and it should not be confined to reconnaissance during daylight, for reconnaissance during darkness is as important for at night time land-marks often take on quite other forms to the eye.

In preparing for a night reconnaissance the following suggestion may assist you. If you have got to operate over an area of country, make an enlargement of it from your map. From an air photograph of the area insert on your sketch hedges, walls, etc. Then set the sketch aside, and on another sheet of paper redraw it from memory. Compare the two, note what you have omitted and redraw it again. Do this several times until the enlargement is photographed on your brain. This means a lot of trouble, but in an important operation it is certainly worth while.

Another better known assistance can be derived by a road map. Take a sheet of paper and down its centre rule two vertical parallel lines representing the road you are going to reconnoitre. Then walk down the road and

mark in the left hand margin everything of importance you see during the daytime, such as landmarks, fences, houses, etc., as well as their compass bearings and the distances between cross-roads, streams, etc. This done, do the same during the night time, marking in the right hand margin whether any difference is noted, such as: " cannot be seen," " tree looks like a church spire," " road disappears," etc. Such a map, which demands no sketching ability whatever, will unfailingly prove of assistance to you.

As regards formations, use day formations closed up, because everybody will then understand them. The position of commanders should be fixed and the rate of march slow. As regards halts, my own experience lead me to differ from the opinion expressed in paragraph 5 that " During halts men may lie down." Should the halt be a prolonged one this may be correct enough ; but for a short halt, especially if men are tired, should they be allowed to lie down they at once pull their ground sheets over their heads and chloroform themselves. A man thus asphyxiated is almost unwakeable and, when he is eventually aroused, for several minutes he is in a semi-idiotic condition. I think, if the halt is to be a short one, it is better for the men to sit down. I do not know whether in fact there is any affinity between snoring and whinnying, but I have noticed that they are apt to keep chorus.

NIGHT MOVEMENT WHEN THE FORCE IS RESPONSIBLE FOR ITS OWN PROTECTION.

100. Night Marches.

A night march may in several ways be compared to marching through a defile, that is to a mountain warfare operation, consequently the same system of protection

should be put into force. This means that the flanks of the column should either be protected by fixed posts, or by flanking parties thrown out by the advanced guard and gathered in by the rear guard. To prevent flankers getting overlooked, each party sent out to one side of the road should be given even numbers, and the other—odd; and as they report to the rear guard, these numbers should be checked, when it can be ascertained whether any party is missing.

Infantry should march in the most exposed position, that is generally in front, with the other arms behind them. If tanks are to form part of the column they should move well behind, or on a separate road altogether. The noise of their tracks will carry great distances, but it frequently is extremely difficult to locate. On quite a still night I have more than once listened to tanks several miles away. At one moment the noise appeared to be coming from the west, at another from the east, at another is seemed quite close, then it died away and was barely heard, then it stopped, and then it roared out again. During training I have heard the rumble of gun wheels five miles off, but the noise on a road does not vary like the noise across country, and its direction can generally be marked down. The noise of tanks can of course be used for effecting feints.

It is most important that everyone should know what to do in the event of an alarm. The column should at once halt, the men lie down or kneel, and local protection automatically move out.

101. Night Advances.

A night advance is a movement in battle formation carried out with the object either of attacking during the night or more often at dawn. The main difficulty is the deployment into columns at the assembly position, and to lessen this and avoid confusion troops should march to this point in ployed formations. Once deployed, they

move to the forming up place and get into attack formations, of which I will give two examples, one for a company and the other for a battalion (see diagrams 15 and 16.)

These examples are nothing more than examples, others can be used according to ground ; but the distances given in them are I consider sufficient.

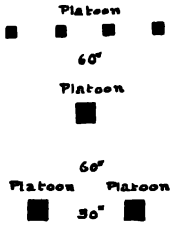

Diagram 15.
Company Night Formation.

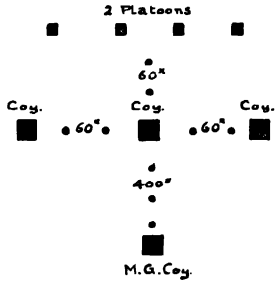

Diagram 16.
Battalion Night Formation.

102. Night Withdrawals.

Night withdrawals are, as I have already mentioned, normal operations of war. In fact frequently it will be impossible to withdraw during daylight on account of the enormous holding power of modern fire arms. It may be taken as a maxim of war that a withdrawal is far easier than a pursuit at night, because the side withdrawing knows where it is going, whilst the pursuing side does not.

The method to adopt is to maintain normal behaviour so that the enemy does not suspect that anything unusual is about to take place ; then, on a carefully observed time programme, to begin withdrawing from the rear working forwards to the front. The use of alarm guns, which are fired mechanically, and of delayed action bombs, etc., may for several hours after a position has been completely evacuated lead the enemy to suppose that it is still held.

NIGHT ATTACKS.

103. General Principles.

Night attacks are generally carried out with the object of surprising a position, of avoiding a fire swept area, or aircraft observation. One of their main limitations is the impossibility to manoeuvre; another, that only small forces can undertake them with any safety, seldom more than one brigade, and a third that exploitation is most difficult.

The best method to carry them out is to feint in one or more directions and strike in another; but, whatever plan is adopted, strong reserves should always be held in hand. Unless they lead to immediate success they should be abandoned, the attacker falling back behind his reserves.

In these attacks each subordinate leader must know the object and the direction and nature of the objective, the formation to be adopted at the forming up place, and the action to be taken if surprised or the surprise fails.

If fired on, an immediate forward movement should be made, but formations should not be broken up or allowed to become disordered by over rapidity of advance.

Tanks are not mentioned in this section, yet their importance for feints cannot be exaggerated, and in the attack I consider that unless the enemy's position is strongly entrenched, they will often prove a most effective weapon. It is sometimes imagined that they are totally blind at night. This is not so, and if proper reconnaissances are made and remembered on the lines I have suggested, it is not very difficult for tanks to steer an accurate zig-zag course across country in the night time by following tracks, hedge rows, the borders of fields, etc., until they strike their objective. This I have seen done over a complicated piece of country in Oxfordshire, and with startling success.

The moral effect of tanks, especially at night time is very great. They are difficult to hit, their noise is nerve-racking, and in the above case I witnessed the enemy's position completely turned by them and the whole of his artillery shot up by their fire.

When used they should not attempt to work in close co-operation with the infantry, who in any case should be provided with clear and unmistakable distinguishing badges.

104. Orders for Night Attacks.

I do not intend to deal with this section as I have nothing to add to the points mentioned in it.

NIGHT MOVEMENTS BY MECHANICAL VEHICLES.

105. General Principles.

Personally, my own experience does not coincide with that laid down in this section when it is said: "It is undesirable to separate convoys at night into small detachments." Given, say, one hundred vehicles, buses or lorries, I am of opinion that they should move forward in groups of ten with at least 100 yards between each group. Each group should have one motor dispatch rider attached to it to keep contact with the group in front, or with the group in rear. Frequently ordinary cyclists can carry out this work, as the average speed of the entire column is unlikely to average more than ten miles the hour.

The column should be preceeded by an advanced guard in motor cars accompanied by motor cyclists. The occupants of one vehicle in each group should before starting be told off as the flank guards of their group and on the alarm being signalled, or a halt taking place, they should at once debus and line the sides of the road. The

rear guard should again consist of two or three motor cars and a party of motor cyclists.

Under peace conditions which, on account of civilian traffic, are quite as difficult as those met with in war, I have seen an infantry brigade and a battalion of tanks move by road at night time a little over forty miles in six hours. Though in this actual move the average speed was no more than seven miles an hour, the roads were narrow and the drivers of the vehicles were all civilians. The enemy was completely turned and attacked in rear.

LECTURE XIV.

CHAPTER X.

WARFARE IN UNDEVELOPED AND SEMI-CIVILISED COUNTRIES.

160. General.

This is a short chapter, yet one of considerable importance to us, for at the moment we are not faced by the likelihood of a great war; but the problem of a small war, especially in India, is always present. With mountain warfare this chapter does not deal at all, and with other forms of small wars only in a very limited way.

Now that I am nearing the end of this course of lectures and before examining the problem which here faces us, I will take this opportunity of returning to my first lecture and examine rather more fully our obligations as soldiers; for this will enable us to obtain a completer picture of the various types of war we may be engaged upon.

In brief, the whole of our duties may be summed up in less than a dozen words: To enforce the will of the government in peace and war. Therefore we are faced by two military problems:

(a) Police work: Maintenance of peace policy.
(b) War work: Enforcement of war policy.

The first may be divided into the following degrees:

(a) The power behind the policy—our inconspicuous everyday duty.
(b) The power to reinforce or reinstate the police—in riots and disturbances.
(c) The power to replace the police—in the event of of a rebellion, when martial law supersedes civil law.

The second can also be divided into three categories of action:

(a) War against organized military force—great wars.

(b) War against partisan forces—guerilla wars.

(c) War against uncivilised peoples—small wars.

Of these six degrees, or categories, rebellions approximate closely to guerilla wars, and both may for tactical purposes be included under the general heading of civil war.

Now, turning to the enemy: The main differences between a civilized and an uncivilized enemy are:

(a) Political: No central government to deal with or to strike at.

(b) Adminstrative: The enemy lives on the country, and has seldom a complex economic organization to damage.

(c) Strategical: The enemy is excessively mobile and possesses no organized supply system to impede him.

(d) Tactical: The enemy is frequently indifferently armed and depends on outside supply for his ammunition.

(e) Moral: The enemy is brave but undisciplined.

When these points are remembered we can work out what we should do and what we require, namely:

(a) Politically, a decisive victory with enemy casualties as a demonstration of our will.

(b) Administratively, a very mobile supply system.

(c) Strategically, great flexibility and mobility of organization.

(d) Tactically, full use of weapons the enemy does not possess.

(e) Morally, "guts and wits," high self-reliance, audacity and discipline.

In small wars we are up against topography far more so than against the enemy himself, and especially so in a campaign on the North-West Frontier of India. In this

case, topography is not, however, altogether advantageous to the hillman; he cannot live for long on a hill top. Normally his farms and villages lie in the valleys, and there are to be found his means of livelihood—his flocks and his crops and stores of food, as well as his women and his children. There are to be discovered our true objectives, and in striking at them aircraft have proved a most valuable arm. An air attack will force him out of his village, to which sooner or later he must return to obtain food. Such attacks demoralize him and upset his lazy everyday life, but in their turn they are only a step towards solving the problem, for its solution is to show a moral and physical ascendency over him, to meet him in the field face to face, man to man, to beat him, to disarm him and to occupy his country and compel him to sue for peace.

This being so, even if only for moral effect, our tactics and strategy must be of a bold order, and for such boldness to be maintained our supply system must be a highly mobile one, and one which can be easily protected; for remember: The enemy's strategy is based not so much upon defeating us in the field as upon attacking our supply columns. He is also aiming at a rear attack, and his objective is also an economic one.

107. Mountain Warfare.

As regards mountain warfare *F.S.R.* refers the reader to the *Manual of Operations on the North-West Frontier of India.* This, I think, is a pity, for its principles are not only of great importance, but as in any war against a civilized nation we shall almost certainly be confronted by the motor car guerilla, and also in many cases by periods of mountain warfare, these principles should be generally understood.

As in any other war, the main operations against hillmen are advances, attacks, halts, pursuits and withdrawals, and though the principles of war equally apply

to these, conditions, as I have already shown, are so different that application of these principles must differ also.

In an advance, the main difficulty is the protection of the supply columns. So great is this, that in actual fact the whole of a force becomes, so to say, a box in which these columns are secured, a box the enemy is always attempting to break into; consequently the longer the box the easier is it for him to attack it. The normal protective system adopted is that of picketing the heights. The bulk of the fighting troops move out with the advanced guard, which throws out pickets to right and left as it moves forward. These clamber up the hill sides, and by posting themselves upon the flanks of the column form its flank guards. As the tail of the column nears them, they descend from the hills and join the rear guard, and from the rear guard they rejoin the advanced guard; thus the protective work continues. From this it will be seen that the whole operation must of necessity be an extremely slow one. There can be no true liberty of action, except by aircraft, for the fighting troops are literally tied to their transport, the protection of which is the governing tactical factor.

Should the line of advance become a permanent line of supply, then this system is replaced by one of protective posts, that is two flanking lines of sangars, or stone block houses, with patrols in between. Though these absorb just as many men, a greater liberty of action is obtained, because the army can be organized in two permanent groups—a protective force to picket the hills and a fighting force to operate outside the protected area. The numbers of men required in the former will, as long as the present system holds good, vastly exceed those in the latter; for example: If we wanted to take one infantry division to Kabul, in all probability five or six divisions would be required to protect its line of communication back to Peshawer.

Is there then no means of overcoming these difficulties?

Yes, the building of roads and the use of mechanical transport, and this is what is now being attempted on the Frontier. Given a road, though the cubic capacity of the protective box does not alter, and may even grow larger, it is telescoped up from a long coffin shaped thing into a compact cube. As in the old system, the heights must still be picketed ; but with this difference, and to explain it I will take an example. Suppose a force were to operate from Razmak, and for a four months' campaign it required 10,000 tons, that is 3,400 lorry loads of supplies. Supposing 200 lorries are used, then seventeen trips will have to be made, and during them the heights will have to be held ; but once the last lorry has returned to Bannu, these may be abandoned for four months, and still communication maintained by wireless and the severely wounded evacuated by air. The road and the lorry, that is the motorization of the Frontier, will entirely change the old tactical problem of protection.

As regards the attack, I will examine the use of the light tanks rather than that of infantry. Infantry tactics are well known, but those of the tank have scarcely been considered, and though I possess no actual experience in the use of these weapons in mountain warfare, in 1926 I examined over 1,500 miles of the North-West Frontier from the tank point of view, and my conclusions are that, omitting engagements in the open valley land in which obviously tanks can take part, in two operations, namely, the attack on villages and the attack on defiles, they are likely to prove invaluable weapons.

In the first, what is the difficulty? It is that the majority of the villages are rude yet strong fortresses. Their huts and walls are built of sun-baked mud, and often each family compound is provided with a mud tower, which is by no means easy to destroy by mountain or even field artillery. For infantry to approach these towers often means certain death ; but a light tank can easily do so, because it is bullet-proof. If equipped with a lachrymary gas projector, it can blind the occupants ;

if with a small gun, mortar, or machine gun, it can open fire at fifty yards' range on the loop holes; or if with a smoke producer it can blot out all vision and so safeguard the infantry advance. These are all quite simple methods of attack, and there can be no doubt that any one of them would prove effective. The best, so I think, is the use of lachrymary chemicals either from a projector or contained in a shell.

Turning now to an attack on a defile, what are the main difficulties? The defile cannot be avoided, because the nullah used is sure to be the line of supply, and this cannot be abandoned. The enemy occupy its two flanking

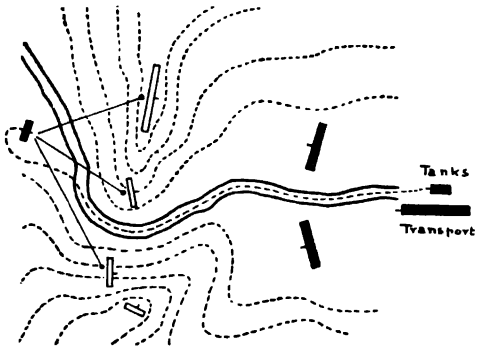

Diagram 17. *Tank Nullah Tactics.*

heights. To attack them frontally means a heavy casualty list; to outflank them is often impossible and frequently difficult; yet if they can be outflanked, that is threatened in rear, tribesmen are so sensitive to such a threat that they generally abandon their position. I examined many of these defiles, and most which I looked at presented little or no difficulty to the advance of light tanks, which in a few minutes could move up the nullah, and by mortar and machine gun fire take the enemy in rear (see diagram 17). The value of such an attack is, that the enemy will be caught between two fires, and his line of retreat threatened if not cut. I feel certain myself that once hillmen have

been attacked in this way, on the next occasion directly they see the tanks advancing they will bolt. Defile forcing will consequently loose its dangers.

In a major small war, such as a war with Afghanistan, my own opinion is that the hope to bring it to a successful conclusion by, say, picketing the Khyber route, as has been done in the past, is no longer a profitable operation of war, because our enemy will be armed with modern rifles and machine guns. Instead, I believe, that a properly equipped mechanized and motorized force moving out from from New Chaman could reach Kandahar in twenty-four to thirty-six hours, and from there could operate against Kabul with comparative ease. Picketing might have to be resorted to in places, but generally the protection of supply columns would be carried out by mechanized escorts. I mention this fact, because I firmly believe that mechanization and motorization are quite as important in small wars as in great.

The other mountain warfare operations, namely, siting and constructing perimeter camps, pursuits and withdrawals are all dealt with in such detail in the Manual that there is no necessity for me to examine them here.

BUSH FIGHTING.

108. Conditions Affecting Fighting in Bush and Forest Countries.

Each year renders the possibilities of bush warfare more remote, for civil motorization is rapidly conquering the areas in which it can take place ; yet its study is of importance, for from the experiences of this form of warfare in the past may be learnt lessons which will help us in forest warfare even if it takes place in a great war.

The obvious difficulty in this type of warfare is to see, consequently survey, reconnaissance, and map making from air photographs become all important. Local reconnaissance is always difficult, for sometimes the bush

is so thick and entangled that before movement can take place tracks have to be cut through it.

In this type of warfare all columns should be kept well closed up. The advanced guard should be close to the head of the main body, and the rear guard should be strong, because savages are very prone to attack a column in rear. The advanced guard and rear guard

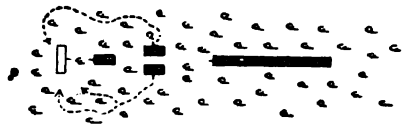

Diagram 18. *Bush Advanced Guard Tactics.*

should be organised in three groups (see diagram 18), the advanced group and two flanking groups. Directly the advanced group, or point, is fired upon, it should halt and hold the enemy with its fire, whilst the flanking groups move outwards, and, under cover of this fire attempt to turn the enemy's flanks and take him in rear. This operation is once again but a special reading of our old friend—hold, manoeuvre, hit.

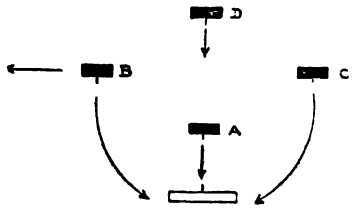

Diagram 19. *Forest Warfare Formation.*

In forest fighting the soundest formation to adopt is that of the diamond, or elastic square, an advanced guard, two flank guards and a rear guard, each group being prepared to assume any one of these three duties. Thus, in diagram 19, in a column advancing with B as advanced guard, if A is attacked, this group holds, and B and C manoeuvre towards the enemy's

flanks, whilst D remains in reserve. If B is attacked, then this group holds and A and D manoeuvre, and so on.

An interesting example of these tactics occurred in 1780 at King's Mountain during the war of the American Rebellion. Major Patrick Ferguson at the head of several hundred English troops and local Militiamen, was confronted by a number of American backwoodsmen. I forget now who their commander was, but he was no mean tactician. He organized his force into three groups—A, B and C, see diagram 20. When A came into contact with Ferguson's column—D, it fell back, and D advancing was suddenly threatened in flank by B, and so had to change front to meet this threat, whereupon A turned

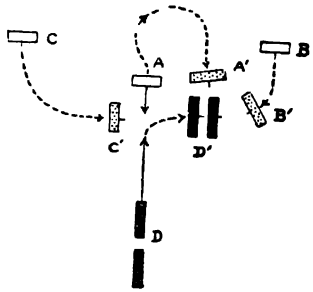

Diagram 20. *Battle of King's Mountain,* 1780.

about and struck at D's left flank and C fell upon D's rear. A prettier piece of forest tactics it would be hard to devise, further, it is just as applicable to-day as it was then.

Forest warfare has bulked large throughout military history. Varus's legions were destroyed in the Teutoburgerwald in A.D.9 ; Braddocks' army was cut to pieces on the Monongahela, in 1755, and during the American Civil War Grant's campaign in the Wilderness was the largest operation of this kind recorded in history. Of all forest warfare leaders, probably Colonel Bouquet, the first Lieut-Colonel of the 60th Royal Americans, now the 60th K.R.R.C., was the most expert, and a tactical

formation he made use of to defeat an encircling attack in dense forest land is worth noticing, because such attacks are very difficult to deal with .

When halted, Bouquet formed a square of men with a chain of advanced posts thrown out (see diagram 21). In the centre of the square he parked his transport and in its corners he drew up his mounted and foot hunters in four groups. When the Red Indians attacked they

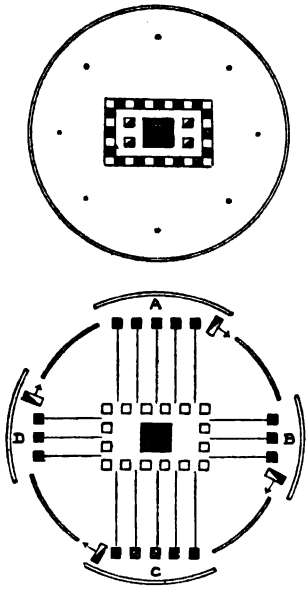

Diagram 21. *Bouquet's Method of Attack.*

did so concentrically, and as the posts were driven in the sides of the square suddenly opened, half each face moving forward under the fire of the other half which remained where it was. This resulted in the savages being driven back in four directions. Thus automatically four gaps in their circle were created, which in diagram 21 are marked A, B, C, D. The hunters, on horseback or on foot, according to the thickness of the undergrowth, moved forward through these gaps and turning to the

right or the left attacked their enemy in rear. Though, on account of machine guns, these tactics would be more difficult to apply to-day, still I think they could be adapted, and that successfully.

109. Convoy Camps.

Convoy camps have been used ever since wagons and carts encumbered a battlefield. In medieval times, when armoured knights fought armoured knights, their wagons were drawn up in laager formation in rear of them, and were in fact fortresses manned by camp followers. To these, when weary with jousting, the knights would retire and refresh themselves. (War in these days was a gentlemanly affair). Ziska, in the Hussite wars, (14th Century) used his wagons to form veritable mobile fortresses: and in the nineteenth century, when attacked by Red Indians or Zulus, the Americans and Boers made use of laagered wagons for protective purposes.

In organized warfare they have not been used for many years; but the advent of the motor car guerilla, and the increasing likelihood of transport being attacked by armed motor cars, armoured cars and tanks, will compel armies to return, not to this actual method of defence, but to its modern counterpart. Mechanical transport when halted must now be carefully protected, and the locality to look for is one which cannot easily be observed from the air, and which offers good anti-tank and anti-armoured car protection. Such a locality is not easy to find, because lorries require roads, concealment from the air demands in most cases trees, and protection against tanks demands water obstacles, and against armoured cars roads which can be effectively blocked.

DESERT WARFARE.

110. General Principles.

The controlling factor in desert warfare is scarcity of water, consequently desert tribes, who are nearly

always mounted, do not usually attempt to assault or to push home an attack ; but in place, by circling round and round their enemy, they aim at slowing down his advance between two watering points, and by so doing compel his capitulation by offering him no alternative to surrender except death from thirst.

This method of warfare is as old as war itself, and again and again have the Scythians, the Parthians and the Arabs annihilated great armies, as Crassus was

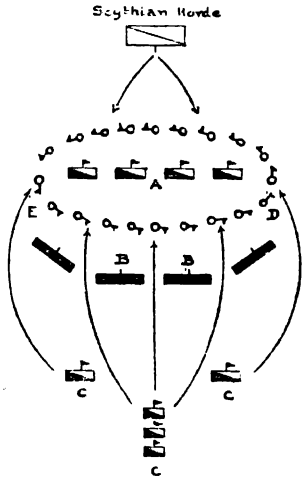

Diagram 22. Alexander's Anti-Scythian Tactics.

annihilated at Carrhae in 53 B.C. Alexander the Great, who was never at a loss for a tactical solution, whether he was confronted by an organized army, guerillas, hill tribes, or a siege, defeated the mosquito attack of the Scythians by a method which for cunning has seldom been equalled. First he threw out, well ahead of his main body, a strong force of light cavalry and horse archers —A in diagram 22. Seeing these men, at once the Scythians broke their horde formation and began circling around them. Next Alexander advanced his infantry in half moon formation—B, and drew up his heavy

cavalry—C, behind them. Suddenly, at a signal, his heavy cavalry galloped forward through and around the infantry, and filling up the gaps D and E bottled up the Scythian horse between the light cavalry and the infantry. This done, his enemy was speedily slaughtered.

To-day, I do not think it would be impossible to carry out the spirit of these tactics by means of armoured cars; for its ingredients are—a bait (A), two restricted flanks (A and B), and a highly mobile force (C) to drive the two corks home.

The difference between these tactics and those made use of by ourselves in Egypt and the Sudan, some forty years ago, are that we formed hollow squares to meet an attack, whilst Alexander formed a hollow square to entrap an attacker. His square was in fact formed round the attacker, it was an offensive square.

On account of aircraft, armoured cars, tanks and mechanical transport, desert warfare is likely to lose its sting. Large supplies of water can now be carried, and the mobility of the machine will in the end beat the mobility of the horse.

LECTURE XV.

CHAPTERS XI, XII AND XIII.

CHAPTER XI.

Movements by Sea, Land and Air.

In this final lecture I do not intend to continue the system I have hitherto adopted, namely, of examining each section in turn, because the last three chapters in *F.S.R.* are routine and not tactical ones, forming in fact appendices to the preceding ten. The information they contain is mainly of a detailed nature, and I do not think I can add much of interest to it.

Movements are by sea, land and air, and the only one which directly concerns us is the second, which until recently was carried out by road and rail. To these must now be added cross-country movement, by which I do not mean that there is anything novel in this third degree of movement, far from it, for it is the most primitive of all; but that for purposes of transport, the tracked or multiple-wheeled petrol driven vehicle can now definitely compete with the railway train, the lorry and the horse wagon. At present these vehicles are not extensively used for commercial purposes, but there can be little doubt that the time is approaching when in badly roaded countries we shall see true cross-country trains hauling upwards of 100 tons. When such come into use, it will not be long before armies seek to free themselves from the shackles of the railway so that their strategy may become more flexible and harmonize more closely with the changes now taking place in their tactics.

More than any other invention, the introduction of

the railway affected the organization of modern armies. Just as before the introduction of the McCormick reaper big scale agriculture was impossible; so before the introduction of the railway, big sized armies were impossible. By this I do not mean that before the days of the railway large armies were unknown; but that the largest of these armies was but a small affair when compared to the veritable hordes of men which fought in the last war. These hordes were only possible because the railway could supply them. The road alone could never have done this. The railway could feed great marching masses, and these great masses by extending so as to cover the railways protected these jugular veins from attack. So great were these extensions that frontages ran into hundreds of miles, flanks were either pinched out, or became all but impossible to turn. Tactics, consequently, reverted to the primitive order of the Greek phalanx, which advancing or retiring up or down a valley, always sought to rest its flanks upon the hills on each side. Push of bullets replaced push of pikes, and should one side be forced back, then if this side could destroy or disorganize the railways as it retired, the pursuing horde could not be fed, consequently its strength dwindled until it was insufficient to push back the retreating enemy, who halted, dug himself in, and defied further pressure.

In all the great artillery battles of 1916-1917 we see this clearly. The railways enabled a million men to be assembled and fed, but once the battle area was entered, the roads, having been destroyed by the artillery bombardments, rendered this feeding so difficult, that even had the enemy packed up and retired a hundred miles no sustained advance could have taken place until the railheads had been pushed forward and the roads repaired. All that could have been done would have been to carry out a pursuit with a comparatively small force, which could have accomplished little or nothing, because on its approach the enemy's horde would have halted, turned about and have eaten it up.

We see, therefore, that though strategically, the railway was a benefit, tactically it created a deficit, and that the link in movement which was missing was the crossing of the battle area, an area in which roads and railways are either destroyed or sufficiently damaged to delay an advance; this delay being in direct proportion to the size of the army to be advanced. The only practical solution to this problem is cross-country transport.

I will turn now to a smaller yet equally important aspect of movement. It is obvious that for road movements a man in a motor car can travel more rapidly than a man on his feet. It is equally obvious that there is no great difficulty in moving the men of an infantry battalion from place to place in mechanical vehicles; but if by doing so they are divorced from their transport, for the time being they cease to be fighting units.

It will be at once recognised that this lesser problem is in nature very similar to the greater; for whilst in the railway problem the difficulty was to maintain fighting power, here it is just the same, and as the solution of the first was to provide an army with cross-country vehicles, in the present problem it obviously is to motorize the first line transport. Once this is done, then, when a battalion is moved in mechanical vehicles, its transport can move with it.

Though solving one problem, this motorization of the transport at once creates another, which is the difficulty of moving mechanical transport with a marching column. In an infantry battalion it is quite easy to leave echelon B behind; to brigade it, protect it, and then when it is required to whistle it up. But echelon A cannot be left behind. To place it behind a marching column is to divorce it from the troops—to disarm them temporarily, at any moment the machine guns and light automatics may be required. As long as these weapons cannot be easily carried by the men themselves, the only practical solution would appear to be to motorize the infantry, or at least organize infantry battalions so that they can be

easily enbused by complete sub-units. When this is done rapidity of movement can be assured.

At once arises another difficulty : If infantry battalions are normally to move in mechanical transport, how are they going to be protected, for a bus or lorry column is not a tactical marching formation. I have already explained in a former lecture the necessity for giving such a column a potential advanced guard, etc., but this protection which is purely one-dimensional, that is protection in a vertical line, if suddenly met by a deployed enemy will have but a slight chance of carrying out its work.

What then is the solution? The only practical one is to escort the infantry, and the best escort will certainly be the light tank. Consequently, it would appear, that the most suitable organization for an infantry brigade is three infantry battalions and one light tank battalion, just as for an army it will be the fighting mass and the cross-country transport columns.

Why have I entered into this detail? Not only because none of its is included in *F.S.R.*, and cannot very well be included at present, but because to-day we are faced by a change in movement, an expansion of one of the three elements of war, and I want to show as clearly as I can that such a change must inevitably influence the remaining two elements—offensive power and protection. Military organization is built upon the foundations of these three, and so must change with them.

Before I leave this chapter I should like to say a few words on march discipline. First, the more frequent do movements by mechanical vehicles become, the more perfect must the march discipline be when these vehicles are abandoned for normal marching, and abandoned they must be several miles from the point to be attacked. Unless this is so, the fullest advantage will not be gained from their use. There must be no overloading of vehicles, a temptation which will grow as motorization grows ; no waiting about and no time lost. Good march discipline largely depends on physical fitness, which in its turn

depends on adequate feeding and rest.

Rest may be examined under two headings—halts and bivouacs, and both should be reduced to a drill. Weather permitting, on a short or long halt, the men should automatically fall out on the left side of the road, remove their packs, open their coats and lie down. Lying down rests the whole body, it is for this reason we do not go to bed standing up. At a long halt, boots should be taken off, socks removed and beaten out, and then replaced on opposite feet—the former left on the right foot, and the former right on the left. If this is done many a sore heel will be spared.

Bivouacs should be carried, especially in wet weather. Four men should constitute a bivouac, and all tents should be dressed, if cover from air observation permits, as a camp is. This, in the event of an alarm, will save confusion. Directly the men have had their food they should be turned into their bivouacs and rest.

CHAPTER XII.

Orders, Instructions, Reports and Messages.

An operation order is a plan in writing, either in an official or an unofficial form, and it does not matter much which, as long as the order is clear. I remember once, during the South African War, one of my intelligence agents writing an excellent unofficial report to General W. G. Knox which began as follows: "Dear General, things are getting b—— thick here . . ."—and I have seen orders quite as unconventional.

The value of the official form is that it assists the writer to think logically. In actual operations, when the issue of orders can be preceded by a conference, it is not always necessary, or desirable, strictly to adhere to it. Information as regards our own troops and our intentions are frequently better left out.

What is a conference? It is the explanation of an idea and a distribution of duties to the executive, and not a seeking for an idea and letting people do what they please. The average subordinate commander will usually grumble over any order he may receive. This is natural, for, in a way, from the start it exonerates him from blame should it fail. Yet nothing does he love better than a definite order, in any case it reduces his responsibility.

An order is evolved from a appreciation, and, as I have said before, it is the commander and not his staff who should do this work. The method of appreciating a situation is quite simple. First consider your object: secondly, the conditions which will affect its attainment; thirdly, the courses open to both sides, and lastly settle on your plan.

What do we get here?

(a) What we want to do—the leading idea.

(b) The factors which will assist and resist us in attaining it. These two must be equated by means of the principles of war, for ourselves and for the enemy. The results are:

(c) Various possible plans for both sides.

(d) Compare these carefully and select the best.

If the best is open to objections which cannot be overcome, then hold a strong reserve in hand. This is your capital which will save you when there is a run on the military stock exchange. Never, if you can possibly avoid it, break up an organization; the enemy will do this for you quite rapidly enough.

Probably the most difficult plan to formulate is that for an attack, and this being so I will examine such a plan in detail.

There are three fundamental ideas in planning, namely:

(a) The plan must carry out the object;

(b) It must be as simple as possible;

(c) And as flexible as possible.

If these three points are remembered a foundation of rock will be laid to the plan.

What now is exactly meant by flexibility? Flexibility is like elastic, it is power to move where you want to without shattering your plan. It is our old friend liberty of action.

If the enemy can stop your plan working, in seven cases out of eight your command will become rigid or fixed. Conversely, to fix the enemy is the first step towards gaining flexibility. Therefore flexibility is gained by so distributing your arms that the chances are that you will fix the enemy before he fixes you. How is this done?

First you must find the enemy, and find out all you can about him, and not merely paint a mental picture of what he is going to do. Secondly, you have got to decide where you intend to attack, and with what force. You have got to attack to hold and you have got to attack to hit. Thirdly, you have got to protect your attack, and lastly you must be prepared to meet the unexpected, consequently you will require reserves.

There are, therefore, three categories of troops in every attack:

(a) The attackers divided into those who hold and those who hit.
(b) Troops which protect the attackers;
(c) And reserves.

Next we come to the question of the decisive point of attack. This I have already answered at some length, so all I will repeat here is the order of importance of attacks, which are:

(a) The rear attack;
(b) The flank attack;
(c) And the frontal attack.

Whichever is decided upon, then that part of the enemy's army which it is not your intention to envelop or penetrate, must be held back and pinned to its ground, so that it cannot move towards the point of attack.

Having decided upon the point of attack, we must examine the relationship between our own force, the nature of the ground, and the enemy's force.

The ground can either assist or resist you, also it can assist or resist the enemy. Its assistance and resistance is threefold in nature. It can facilitate or impede:

(a) Observation;
(b) Protection;
(c) And Movement.

To-day, we have two main categories of attacking troops—armoured and unarmoured, and, for reasons I have examined in a former lecture, consequently,

(a) Tanks should be used over open spaces;
(b) Infantry should be used on broken ones;
(c) And tanks should be employed in outflanking operations.

To turn now to the enemy's force. Your first problem is to fix him, that is to deprive him of power to move. What part of your force will you require for this operation? And remember that the whole art in holding is to fix a large force by means of a small force. You can do one of three things:

(a) You can attack him;
(b) You can threaten to attack him;
(c) You can bluff.

Now as to your reserves. What force will you require, and what are reserves for?

(a) To meet the unexpected;
(b) To support the attack or the defence;
(c) To pursue or cover a retreat.

When you have settled this point you can then turn to your decisive attack, and see what you have left over for it.

It may be said: "This is a very cautious way of proceeding." My answer is that to-day there are so many bullets flying about on the battlefield that caution has become a high virtue, as high as courage itself. Few things are so expensive as a shattered attack. Large numbers in the decisive attack are not usually essential but the following factors are:

(a) Surprise, which morally multiplies numbers.

(b) Concentration of force, which means superiority of weapon-power at the point of attack.

(c) The fullest possible protective power to safeguard the attack.

Having settled all these points, we must consider two other factors, namely, control and supply.

The force headquarters controls all the arms and services, and as distance in war is not so much a matter of miles as of communications, control largely depends on your power to communicate. Loss of control means paralysis.

Lack of, or loss of, supply means starvation. It is worse than useless to launch an attack which cannot be supplied. To cut out the organs of supply is like removing the stomach from a man; they are the ultimate goal of the decisive attack, or pursuit; for an enemy without bread and beef is soon reduced to a starving mob.

Co-ordination in the attack depends on:

(a) Correct distribution;

(b) Rapid control;

(c) An adequate supply.

Distribution is arms fitted to ground in relation to the enemy and the object. Its aim is:

(a) To pin the enemy down—initial attack.

(b) To keep a reserve in hand—for unexpected attacks;

(c) And to carry out the decisive attack—final attack.

Control depends on:

(a) Full information of the enemy;

(b) Full information of our own troops;

(c) And rapid communication of orders.

Supply depends on:

(a) Adequate transport;

(b) Good and safe roads;

(c) And traffic control.

If these four trinities are remembered when a plan is being worked out, it is not likely to be an indifferent one.

CHAPTER XIII.

Intercommunication.

In this final chapter of *F.S.R.* I will only examine the Brigade signal system.

In an infantry brigade we have battalion signallers and a brigade signal section—two categories in theory, but in practice only one, for unless there is a complete give and take between these two, team work will suffer.

Though the brigade signal section officer is not a staff officer, he should in actual fact be looked upon as such. This does not mean that he should do staff work for the brigade, but that he should know not only all what is happening but all what the staff is expecting. To be forewarned is to be forearmed. Communications are vital to control, and communications are not easily picked up and put down again. If inter-communication between events in front and ideas behind are not maintained then two battles will be fought—a mythical headquarter battle and an actual front line one. In which case the real enemy is to be found in our own headquarters. Whatever doubt may exist as regards the lessons of the last war, this is one which cannot be controverted.

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