

CHAPTER VIII

THE PHYSICAL SPHERE OF WAR

The first ground handful of nitre, sulphur, and charcoal drove monk Schwartz's pestle through the ceiling: what will the last do?—T. CARLYLE.

I. THE PHYSICAL ASPECT OF WAR

It is in the physical sphere of war that we find the most pronounced differences to peace, for war is pre-eminently a physical struggle for mastership in which the moral conventions of civilized nations are temporarily set in abeyance. So powerful is this final manifestation of force that even to-day it still obscures the purpose of war, and, in the mind of the average soldier, replaces the political object by one of a purely military value.

Destruction of the enemy's physical strength is the canon of the physical school of war; to the moral school, it is the destruction of the enemy's will. I have touched upon the views held by these two schools in my last chapter, and for a moment I will return to them, for, unless a true relationship is established between the moral and physical spheres, the soldier is apt to go astray, as so many soldiers in the past have done.

As a base of argument I will quote a passage from Marshal Foch's *Principles of War*. He writes:

"Ninety thousand vanquished men withdraw before ninety thousand victors merely because they have had enough of it, and they have had enough of it because they no longer believe in victory, because they are *demoralized*, because their *moral* resistance is exhausted" (General Cardot) (merely *moral*: for the physical situation is the same on both sides). It was with this in his mind that Joseph de Maistre wrote: "A battle lost is a battle one thinks one has lost; for," he added, "a battle cannot be lost physically." Therefore it can only be lost morally. But, then, it is also morally that a battle is won, and we may extend the aphorism by saying: A battle won is a battle in which one will not confess oneself beaten.¹

This is magnificent, but it has little to do with the reality of war; in fact, it is common nonsense.

¹ *The Principles of War*, p. 286.

To say that "a battle cannot be lost physically" is to ignore the greater part of the history of war. Take the following two cases and examine them.

(i.) I meet a man to whom I intend to give a sound thrashing. I refuse to be beaten, but, nevertheless, he knocks me down and beats me, because, as it happens, he is twice as strong as I am, is more lucky, or more skilful.

(ii.) Next time I meet him I intend to kill him. He rushes at me, but not for a moment do I lose my confidence in victory, because I pull out of my pocket a pistol and shoot him dead.

In the first case muscle wins in spite of will ; in the second, the will of my adversary has no possible chance of winning. Therefore to say : "A battle won is a battle in which one will not confess oneself beaten" is absurd, for all it can mean is that if both sides are in all respects equal, save in will power, then the most determined will win, or if unequal, and the numerically stronger side is composed of cowardly soldiers, then the smaller and more courageous side may win. This absurd doctrine—military witchcraft of the lowest order—very nearly led to the extermination of the French armies in 1914.

That such a doctrine could ever have been accepted by intelligent men is amazing, seeing that Clausewitz, the high-priest of the modern theory of war, had clearly stated :

Courage and the spirit of an army have, in all ages, multiplied its physical powers, and will continue to do so equally in future ; but we find also at certain periods in history a superiority in the organization and equipment of an army has given a great moral preponderance ; we find that at other periods a great superiority in mobility had a like effect ; at one time we see a new system of tactics brought to light ; at another we see the art of war developing itself in an effort to make a skilful use of ground on great general principles ; and by such means here and there we find one General gaining great advantages over another.¹

This is common sense. In brief, *moral* multiplies physical force, and physical force multiplies *moral*. It is not only necessary to imbue the soldier with the highest *moral* by careful training, but also to furnish him with the most effective weapons, means of movement, and means of protection, and to teach him how to make the most skilful use of these means, so that he may safeguard his *moral*, in order that this *moral* may fortify his offensive and protective actions.

¹ *On War*, vol. ii., p. 5.

Mental force does not win a war ; moral force does not win a war ; physical force does not win a war ; but what *does* win a war is the highest combination of these three forces acting as *one* force. Do not let us, therefore, belittle physical force, for it is an essential of this trinity, and all other forces are as nothing without it. To Shopenhauer the world may well be " will and idea " ; but to the soldier war is very largely a matter of blows, and, if he does not believe in them, then he will get his head cracked, and, if he only believes in them, then he will die of a moral arterial sclerosis. Carlyle cries : " Feeblest of bipeds ! Three quintals are a crushing load for him ; the Steer of the meadow tosses him aloft, like a waste rag. Nevertheless he can use Tools ; can devise Tools : with these the granite mountain melts into light dust before him ; he kneads glowing iron, as if it were soft paste ; seas are his smooth highway, winds and fire his unwearying steeds. Nowhere do you find him without Tools ; without Tools he is nothing, with Tools he is all."¹

These are words of wisdom, and, in the next war, one of the supreme questions will be : who has the best tools ? For it is the better weapon which more efficiently expresses will and *moral*, and more effectively protects them.

2. THE PHYSICAL ELEMENTS OF WAR

I have laid it down that the elements of force are stability, activity, and co-operation, and I have shown that in the mental sphere these elements are represented by reason, imagination, and will, and in the moral sphere, by fear, *moral*, and courage ; now I will turn to the physical sphere.

In the normal pursuits of peace, as I explained in chapter iii., man's desire is to protect himself, and he does so through his power to work and ability to move. I have also pointed out that there is no intrinsic difference between peace and war, the difference being one of degree. Obviously, if fear is an essential element in war, man must protect himself ; and, if courage is another, he must be imbued with an offensive spirit, and, obviously, he must be able to move. We thus obtain three physical elements of war—namely, protection, offensive action, and movement. The first is the stable base, the second the active, and the third the co-operative element.

In chapter iii. I showed that physical energy was expressed by the muscles of the body, and that these could either construct or destroy. In chapter v., when discussing the instrument of war, I have shown that Marshal Foch considers that all systems of

¹ *Sartory Resartus*, Thomas Carlyle, chap. v.

tactics should be based on "resisting power" and "striking power"; this is an idea which may be considered as universal in war. For instance, in Balzac's *Contes Drolatique* we read of a certain Captain Cohegrue of whom it is related: "Dans les grosses batailles, il taschoyt de donner des horions sans en recevoir, ce qui est et sera toujours le seul problemesme à resouldre en guerre." ("In great battles, he endeavoured to give blows without receiving them, which is and always will be the only problem to solve in war.") And why? Because the resultant is liberty of movement, and, as Frederick the Great said, "to advance is to conquer!"

What has not been so universally accepted is the relationship between the natural and artificial means of fighting. I have shown that the three elements of force find expression in the structure of the military instrument in the form of protective troops, combat troops, and pursuit troops, and consequently, since these three types of troops no longer use their fists and teeth and solely their feet for protective, offensive, and mobile purposes, but, instead, weapons, means of protection, and means of movement, the first two of which are in nature mechanical and therefore artificial, and the last are rapidly becoming so, these artificial means should bear a distinct relationship to the elements they are intended to express. Lloyd is the only writer I know of who definitely grasped this relationship; he says: "Weapons should express force, agility, and mobility." And in his opinion an army is not complete unless it includes infantry, cavalry, and light infantry.

In most armies we see weapons evolving on no rational plan. New arms are invented and introduced without a definite tactical reason, and without a definite relationship to structure, maintenance, and control. Old weapons are maintained; the old and new are mixed irrespective of their elemental values. Proportions are not logically arrived at, but are the outcome of ignorant opposition on the one side and enthusiastic aggressiveness on the other. The whole process is alchemical, is slow and costly and inefficient; ultimately trial and error wins through. Thus for a hundred years we find the French knights charging English archers; for another hundred years or so, cavalry charging musketeers and riflemen; and I suppose we shall see for yet another hundred years infantry charging tanks. What for, indeed what for? Not to win a battle, for the impossibility of this is obvious to a rhinoceros. No; but to maintain the luxury of mental indolence in the head of some military alchemist. Thinking to some people is like washing to others. A tramp cannot tolerate a hot bath, and the average general cannot

tolerate any change in preconceived ideas ; prejudice sticks to his brain like tar to a blanket.

The three physical elements of war are moving, guarding, and hitting. In the unarmed fighter this is actually so ; but in organized armies soldiers make use of material means to accentuate and economize their power of movement in all its moods. In order to hit they use weapons ; to guard they use various means, such as cover by ground and armour ; and to move they also use various means—horses, elephants, lorries, tanks, aircraft, etc. Normally, when speaking of the physical elements of war, I shall call them movement, protection, and weapons, in place of power to move, to guard, and to hit, or mobility, protective power, and offensive power.

3. THE ELEMENT OF MOVEMENT

Like the mental and the moral, the three physical elements are so closely related that to separate them is practically impossible, for the utility of weapons and protection depends on movement, and, in war, movement must have some offensive purpose, or one indirectly connected with fighting, and this movement must be protected if force is to be economized.

All physical movement depends on muscle-power. A man may ride a horse or be conveyed in a chariot or a tank, yet these means do not cancel the expenditure of physical energy, for they only economize it.

There are three forms of movement—human, animal, and mechanical ; there are three vehicles of movement—earth, water, and air ; and there are three dimensions of movement— one-dimensional, such as movements along roads and railways ; two-dimensional, such as movements over land and water areas ; and three-dimensional, such as movements under water and through the air. Since the advent of the tank, submarine, and aeroplane, the two last-mentioned dimensions are assuming an importance which will undoubtedly revolutionize warfare.

There are also three types of military movement—strategical, tactical, and administrative. Tactical movements, which are the ultimate aim of strategy and administration, may be divided into protective and offensive movements. The first I will call approach movements and the second attack movements. During the former the one thought of the soldier is to prevent himself from being hit, and during the latter it is to hit his enemy. The more he can hit the less he will be hit ; consequently, indirectly though it may be, not only is the whole action protective in character, but it becomes more and more secure as the offensive

succeeds ; the approach persistently economizing the forces of the attack so that the attackers may, as far as it is possible, retain their initial strength, or increase it.

From this it will be seen that any idea of thinking of the offensive and the defensive phases of war, battle or fight, as separate and distinct acts is absurd, for these two acts form the halves of the diameter of the tactical circle, the circumference of which is the fight. They are, in fact, the positive and negative poles of the tactical magnet called battle.

When I deal with the principles of war I shall have occasion to enter more deeply into this subject ; meanwhile, if we always remember that the object of all attack movements is to develop weapon-power against an enemy, and of all approach movements to prevent the enemy developing weapon-power against us, we shall at once realize that, when we are not attacking—and by attacking I mean using weapons offensively—we are approaching, even if we are sitting in a camp 500 miles from the battle-front. If we remember this—and for the soldier it is one of the most important things that he should remember—we shall never be surprised, and surprise to-day is far easier to effect than in the past, since aircraft can almost as safely attack back areas as front lines. The true appreciation of the approach and the attack carries with it the maximum of security and offensive power. These can never without danger be divorced.

Rising from battle tactics to campaign tactics, the same idea holds good. We are confronted first of all by the strategical movements, and secondly by the tactical. In brief, the whole of strategy consists in placing an army, or the various parts of an army, in such positions that tactical movements may be carried out with the greatest economy of force. Whatever we do, we must economize the expenditure of force. This is a point I shall frequently repeat, as it cannot be repeated too often.

4. THE ELEMENT OF WEAPONS

Offensive intent is expressed by means of weapons, and in organized and civilized warfare man cannot economically protect himself without them. Weapons have three purposes : to kill, to injure, and to terrorize. There are three kinds of weapons : weapons for thrusting, for hurling, and for asphyxiating. The first I will call shock-weapons—such as the lance, sword, and bayonet ; the second missile-weapons—such as the arrow, bullet, and shell ; and the third chemical weapons—such as gas and toxic smokes. Other weapons can be added to these, such as the club for stunning and germs for spreading disease ; but, generally

speaking, we need only think in terms of two types, according to the means used to move them ; namely, those wielded by man and those discharged by mechanical or chemical force.¹

In primitive warfare hitting and hurling weapons were combined in a chipped stone, which could be used as a shock-weapon when held in the hand and as a missile-weapon when thrown. To throw a stone is a protective act, which, if the projectile hits the man it is aimed at, may prevent him approaching to shock-distance. At shock-distance brute force predominates, and skill is reduced to a minimum ; consequently the whole process of organized warfare has proceeded along the straight line of obviating the rough and tumble of body-to-body fighting—the dog-fight of battle. So much has this been the case that to-day we find, because of the invention of automatic weapons, the physical assault, as it was conceived a few years ago, is almost dead ; and it can scarcely be doubted that, when the day arrives in which the bulk of our automatic weapons are protected by armour, the bayonet charge will be as impracticable as one Dreadnought ramming another.

Here I will not, however, pursue this future possibility, for existing weapons provide ample means of illustrating my argument.

As the object of battle is to destroy the enemy's strength, which is generally accomplished by clinching with him, or by threatening to clinch, the infantryman's offensive weapon is the bayonet, and as long as circumstances permit him using the bayonet this fact remains true.

His bullet is his protective weapon, because of its ability to secure the advance of the bayonet. Thus it will be seen that whenever two weapons of unequal range of action are employed, the one of longer range is always the protective weapon, and the one of shorter range the offensive weapon, and, even if three or more weapons are used, this holds equally good for all. Thus though field-guns, when covering a rifle-attack, are acting protectively to the rifles, they are acting offensively to the heavier guns in rear of them, though these heavy guns are simultaneously acting protectively both to them and to the rifles.

It may be considered that this is a purely academical problem, yet it is not so. Its full appreciation, in fact, forms the

¹ Of weapons Clausewitz writes : " Of all weapons which have yet been invented by human ingenuity, those which bring the combatants into closest contact, those which are nearest to the pugilistic encounter, are the most natural, and correspond with most instinct." Consequently from this he deduces the fact that the less the hand-to-hand fight takes place in war the less brutal warfare will become, for it is instinct which renders it brutal, and not weapons (*On War*, vol. iii., p. 250).

backbone of the attack, from which the whole battle organization, like ribs, radiates. From this appreciation may be deduced a tactical rule of high importance, namely :

In all circumstances missile-weapons must be employed to facilitate or ward off the shock.

And even if shock-weapons entirely disappear from the armoury of war, in spirit this rule will hold good in the following form :

In all circumstances the longer-range weapons must be employed to facilitate or ward off the employment of the shorter-range weapon.

The soldier must not only never forget this rule, but it must so completely dominate his thoughts that its application becomes instinctive, for it forms the foundations of fire-supremacy, that crucial act of the attack, the paralysing of an opponent's power to hurl, so that he may be hit, and his strength destroyed.

Every missile which can economically, that is effectively, be thrown, must be thrown. The soldier must not only think, but live and act in terms of fire-supremacy : for it is his sword and his shield, upon which his tactical life depends.

I have called the above tactical act a rule because, in my opinion, it is open of exceptions. Soldiers may on occasion be equipped with an offensive weapon of so small a value that for practical purposes it ceases to be a weapon at all, or else in battle they may be faced by an opponent so indifferently organized and trained that they can destroy him at long range without the necessity of clinching with him. Thus, at the second battle of Ypres, our rifles and machine-guns were rendered temporarily impotent by the use of a comparatively short-range weapon—gas ; and at Omdurman the bayonet was of very little value, since the Soudanese could with ease be destroyed by rifle-fire.

Having now shown what an important part protection plays in movement and the use of weapons, I will consider it in itself.

5. THE ELEMENT OF PROTECTION

The first fact which strikes us in life is that the instinct of self-preservation demands protection in one form or another, and the second, that protection demands activity, or resistance, or, better still, the two combined.

If we examine Nature, we at once see that so far as things living are concerned, nine-tenths of their activities are in character protective. In the animal world, the summit of which reaches to man, we find every type of protection being sought after and applied.

The tiger seeks security through offensive power ; the lobster

through its armoured shell; the cuttle-fish through emitting a "cloud of ink"; the skunk through a nauseating stench; the chameleon through a change of colour; the stick-caterpillar through its ability to represent a twig. The ostrich is supposed to hide its head beneath the sand, and it is alleged that sometimes man raises his above mere imitation, and, gazing into the future, sees the form of events that are to be.

Few studies are more profitable to the soldier than that of natural history, which is an unbroken relation of wars. This fascinating study I cannot pursue here, so I will turn to the element of protection.

The defensive has very little to do with holding a position, for it is just as much part and parcel of every forward movement as of every retrograde one. Static warfare is offensive warfare localized, the aim of both sides being quite as much to win as to avoid being defeated. A purely defensive (secure) war means that the object is to return to the *status quo* before the war began; consequently that the war has lost its meaning, for to wage war and return to the *status quo* is but to squander human energy.

I have already pointed out that the bullet protects the bayonet, and that the approach secures the attack, both these forms of protection are indirect; that is to say, they do not ward off blows, but, in place, impede the enemy from delivering them, either by inflicting blows or by rendering the target invisible or difficult to hit.

Besides the numerous indirect means employed to protect the soldier, a number of direct ones have been used, such as armour, earthworks, fortifications, and gas-respirators. Again, all these means of economizing hitting-power may be divided into static and mobile, direct or indirect protection.

Of all these means, those endowed with the power of mobile direct protection are the most secure, for not only does direct protection nullify a blow at any given spot, but, if it be endowed with mobility, it can be carried, like the carapace of a tortoise, from place to place.

For long this means of protection has been used at sea, and during the Great War it was reintroduced on land in the form of the tank or armoured caterpillar car.

Throughout the history of war there has existed a prolonged conflict between direct protection and movement in order to develop offensive power. Hitting was essential; but was it more economical to protect the hitter or to enable him to move? The result of this conflict was the establishment of two main types of soldiers—the heavily and the lightly protected. Thus

we find: heavy and light infantry, heavy and light cavalry, and heavy and light artillery. Whenever a just balance has been maintained between protection, offensive power, and mobility, tactics have flourished, and whenever the balance has been upset, by one or the other becoming paramount or absent, the art of war has either stood still or retrogressed.

A recent revolution of movement, introduced during the present century, which has already influenced protection to a high degree and will increasingly continue to do so for some time to come, is the power of flight, and, if the aeroplane has not already induced us to review the whole of our existing military organization, it will certainly compel us to do so in the near future.

In the past land warfare has been based on one- and two-dimensional movement; the first having normally been used for strategical and administrative purposes, and the second for tactical manœuvres and battle-lines. The second has protected the first by drawing defensive, perpendicular fronts across the strategical and administrative lines of communication, or by enabling troops to take up a position on the flanks of them, and so threaten any attempt on the part of the enemy to occupy them. These are the grand-tactical aspects of direct and indirect protection, and they have been decisively weakened by the present-day power of gaining three-dimensional movement by aircraft, which now enable areas to be attacked as well as fronts.

6. THE MILITARY OBJECTS AND OBJECTIVES

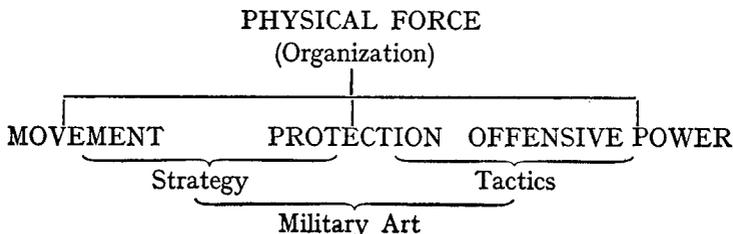
In chapter iv. I examined the various objects of war—the national, ethical, economic, and political objects; but I did not include in that chapter the military objects, because, before these can be fully understood, it is, in my opinion, necessary, not only to understand the nature of the military instrument, but to grasp thoroughly the character of the various forces in war. I have now examined these forces, and, as the objectives in war are physical, I will include the examination of this subject in the present chapter.

The military object may be expressed in the one word “conquest,” which presupposes victory in one form or another, and by conquest I understand that condition of success which will admit of a government imposing its will on the enemy’s nation, and so attaining the execution of its policy. Conquest may also be considered as the grand strategical military idea, and victory the grand tactical military means. Conquest demands the occupation of the enemy’s country, and victory the destruction, or disintegration, of his military power, and, as I have already

noted, hitherto, on account of the enemy's physical resistance, destruction—especially physical—has monopolized the soldier's mind until it has become the end of war. This is an illogical outlook, since the true political object is to secure a better peace—a securer peace, true, but also a more prosperous and contented peace. Security, prosperity, and liberty rest on certain factors. If these factors are their necessary foundations during peacetime, then in war they must not be destroyed, or if injury to them is unavoidable, it must as far as possible be restricted, and it never can be restricted or avoided if soldiers consider that the main object of war is destruction. It is not, for conquest should aim, not at devastating the enemy's land and decimating his people, but at establishing a condition which will permit of one government imposing its will on another at the minimum ethical, economic, and military cost to both sides, and to the world as a whole.

The reader may remember that in chapter v. I quoted Lloyd as saying that "an army is a machine composed of several parts"—of strength, agility, and universality. Here, I think, we find the germ—even if Lloyd did not fully grasp it—of a fundamental truth. Accepting these terms, I will substitute their forms for their natures. For strength I will write "organization," for agility "tactics," and for universality "strategy." The organic object in war is obviously endurance—for the side which can endure the longer is the side which is going to win; the object of tactics is to attain secure activity—that is, protected offensive power; and of strategy, secure mobility—that is, protected movement. If a general can move where he likes he has attained full freedom of movement, and if he can do what he likes then, equally, has he attained full freedom of action. Both these conditions are obviously ideals, and not realities, since no general can possibly be omnipotent. Yet the nearer he approaches to these ideal states the more economically will he be able to carry out the military object.

Diagrammatically, the relationships of strategy and tactics to force may be shown as follows :



Strategy and tactics cannot be separated ; not only are they linked together by administration, which maintains organization, but they are so closely related that unless they interfuse and combine, military art must suffer. In themselves they are abstracts, combined they are a practical reality. One may be paper and the other may be pencil, but art is in the picture drawn ; for art is to be sought in the mental and moral forces of the commander and his men, expressing themselves through physical means.

We thus obtain a trinity in which the stable base is organization, the active base is tactics, and the co-operative base is strategy. The sides of these three bases set together form what may be called the triangle of art, and in this triangle the will of the general rules.

If the student accepts these views, then it follows that the object of strategy is to disintegrate the enemy's power of co-operation, and that of tactics is to destroy his activity. The first is attained by placing troops in such a position that the enemy is unable to exert freedom of movement, and is compelled to move according to the will of his enemy. The second is attained by using troops in such a manner that the enemy's freedom of action is restricted, and he is compelled to protect himself in place of hitting out. The first is only attained through the second ; and the second is only economically attained through the first ; and both, as they are attained, disintegrate the enemy's organization ; and as this organization weakens his stability is reduced ; and, when sufficiently reduced, the result is victory, and, when totally reduced, it is conquest.

To turn now to the objectives. In chapter vi., when examining the mental sphere of war, I stated that the grand tactical object in war is the destruction of the enemy's plan, and that the decisive point of attack is the will of the enemy's commander. As the base of grand tactics is grand strategy, so is its cutting-edge strategy and tactics, for which no better word than art exists to express the combination of the two. Physical force must be expended in battle, consequently the general, when in a strategic mood, aims at so distributing his force that he may, when the clash takes place, be able to concentrate a superiority of force at and against an objective which will enable him to accomplish his plan and frustrate the enemy from doing likewise. As no army for long can endure unless its system of maintenance remains intact, the strategical objective is the rear of the enemy's army, his supply depôts, communications, and railheads, etc. If these are threatened, then, in place of carrying out his plan, the enemy's commander will be compelled to abandon it and fight for their security, and, until he has secured them, his plan will remain in abeyance.

As I shall return to this subject when I examine and elaborate the principles of war, I will turn to the tactical objectives which, I consider, are not so well understood. Here once again I will quote Clausewitz ; he writes :

The overthrow of the enemy is the aim of war, destruction of the hostile military forces the means, both in attack and defence. By the destruction of the enemy's military force the defensive is led on to the offensive, the offensive is led by it to the conquest of territory. Territory is, therefore, the object of the attack ; but that need not be a whole country, it may be confined to a part, a province, a strip of country, a fortress. All these things may have a substantial value from their political importance in treating for peace, whether they are retained or exchanged.¹

And again,

If a battalion is ordered to drive the enemy from a rising ground, or a bridge, etc., then properly the occupation of any such locality is the real object, the destruction of the enemy's armed forces which takes place only the means or secondary matter. If the enemy can be driven away merely by a demonstration, the object is attained all the same ; but this hill or bridge is, in point of fact, only required as a means of increasing the gross amount of loss inflicted on the enemy's armed force.²

This, I think, is a true statement. A position is not in itself an objective to be gained, but only so in relationship to the ultimate object. The seizing of a position may be a means of defeating an enemy, or the defeat of the enemy may be the means of occupying a position ; they are, in fact, relative objectives ; and the second has, in my opinion, not been fully understood, for to defeat an enemy is a complex problem, and not a simple one, as I will now show by means of an example.

A plan of campaign demands a definite object which should never be lost sight of, and this object, in its turn, demands a series of moves each demanding an objective of its own.

The grand-tactical object is to destroy the enemy's plan, and its objective is the peaceful occupation of the enemy's country, which demands the overthrow of the enemy's military power. I will take as my example a type of battle familiar to all soldiers, namely, a trench-to-trench attack, such as was again and again attempted during the first three years of the Great War.

The problem is as follows :

It is our intention to destroy the enemy's plan, the strength of which is based on his power of command and supply, which is protected by several systems of trenches and by artillery and

¹ *On War*, vol. iii., p. 6.

² *Ibid.*, vol. i., p. 38.

infantry. These trenches must be pierced in order to defeat the enemy's field-army, but in themselves they form no serious obstacles, unless defended by weapons.

There are many of these weapons. Which one is the most vital to the maintenance of their strength? The gun; because the gun forms the base from which rifles and machine-guns operate.

We must attempt, therefore, first to master the enemy's artillery, for, when it is mastered, we shall then, by means of our artillery and infantry, be able more economically to attack his infantry, who, having been deprived of their base of action, have been weakened by a loss of security.

If a house is to be rapidly demolished, we do not attack it from the roof downwards, but at its base—its foundations and lower walls. The roof of a 1916 army was its infantry; its lower walls its artillery; its foundations its command. At this time its foundations could not be attacked directly; the enemy's artillery constituted, therefore, the primary objective.

These guns may, however, be placed between two definite, defended zones, in which case, even if they are captured, other defences will have to be pierced before we can attack the enemy's field-army and system of command. This does not alter the primary necessity of destroying him, but only makes the piercing of the enemy's last line of defences our secondary objective.

To attain both primary and secondary objectives, a series of subsidiary objectives may have to be gained, and possibly also in order to weaken the enemy at the point of attack, it may be necessary to institute certain subordinate tactical operations, which can only be considered of value if they reduce the enemy's fighting power at the decisive point of attack to a greater extent than our own.

From what I have now said can be charted out in tabular form the whole series of battle objectives:

Grand-Tactical Object

The destruction of the enemy's plan.

Main Tactical Object

To exhaust the enemy's reserves and defeat his field-army.

Primary Tactical Objective

The enemy's artillery.

Subsidiary Tactical Objectives

Positions leading to the enemy's guns.

Subordinate Tactical Object

To induce the enemy to withdraw troops from the point of attack.

Secondary Tactical Objective

The enemy's last line of defence.

Subsidiary Tactical Objectives

Positions leading to the last line of defence.

The above example is only an example and nothing more, for each attack, according to the conditions it is likely to be confronted by, will demand individual consideration. The point I have attempted to make clear is this: that every army has an organization, and that the most vital part of the organization becomes the primary objective—the bull's-eye of the target. Armies, like animals, vary in mind and body; some have small brains and large bodies; others have small bodies and large brains; others possess a thick hide; others require large quantities of food; thus I could go on multiplying these characteristics. All possess a variety of limitations; it is the most pronounced of these limitations which we should attack; consequently, though the grand-tactical object remains the same, the nature of the objectives to be attacked vary directly with the nature of the military organization of the enemy's forces and the position they occupy.

7. STRATEGICAL FORMATIONS

From the objective I will now turn back to the instrument, which is an organization possessed of mental, moral, and physical force; and I will examine, not strategy and tactics, which, conjoint, largely constitute the art of war, but the forms of their application.

Strategy mainly consists in combining movements, and security of movement not only depends on local protection, but on the strategical distribution of the forces in the field.

Movement is not only conditioned by the plan adopted, but by the form of the object moved. In war the will of the commander formulates the plan and the strategical formation used is the shape or form of the military projectile. The secret of all economic military formations is that they must possess harmony of offensive and defensive power through movement. Movement in its broadest sense being what I will call "locomobility"—that is, freedom to move in all directions without unnecessary loss of energy or time.

In warfare in which supply is governed by a one-dimensional means of movement locomobility is most difficult to attain. As these are the wars which at present face us, I will first of all outline the main strategical formations of armies as we know them to-day, and when I have done this I will turn to a mechanically propelled army and note how cross-country movement will influence formations.

As the main tactical problem in battle is to give blows without receiving them, the aim of strategy is to place a body of men in

such a position that it can most economically solve this problem. The solution is to be sought in the adoption of a formation which will allow of the most rapid approach culminating in the most rapid deployment; for formations must be extended in order that the troops may make the fullest use of their weapons. "Columns," writes Napier, "are the soul of military operations; in them is the victory, and in them is safety to be found after a

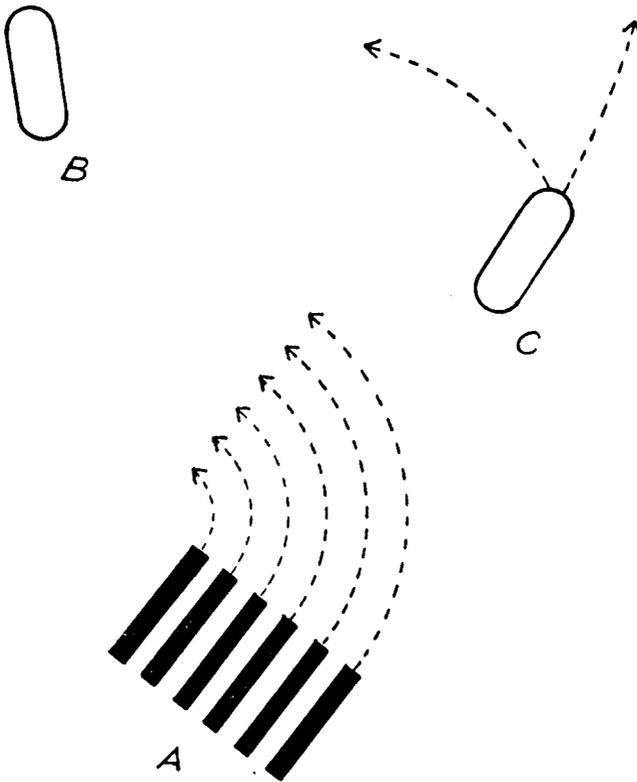


DIAGRAM 2.—COLUMNS IN PARALLEL ORDER

defeat. The secret consists in knowing when and where to extend the front." In other words, to deploy at the right time and the right place is the true foundation of the battle, and, as long as armies cannot move extended, even if it were desirable that they should, columns will have to be employed. I will now examine this question.

8. THE COLUMN FORMATION

The simplest form of column is a formation of men in Indian file. On a road, according to its width, this formation is normally stiffened to a column of threes, fours, or eights.

A hundred thousand men in fours, at one yard between fours, would constitute a column fifteen miles long. There would be, therefore, a day's march between its van and rear. If these hundred thousand men are organised as six divisions of all arms, with transport, the length of the column will be approximately five times as great, i.e. seventy-five miles. It would take, therefore, five days for it to pass a given point. Marching at fifteen miles a day, it possesses good mobility, but its locomobility—that is, its power to move at right-angles to its line of advance—is negligible.

As such a column is a most cumbersome formation, I will split up this gigantic human serpent into six columns, and will place these columns side by side and call them Army A (see diagram 2). I will suppose that this army is marching towards a hostile force—C.

Leaving the question of reserves out of the problem, it makes no difference whether A intends to envelop or to penetrate C, for there can be but one march formation which will permit of all A's units striking the enemy together. This formation is that of a line of columns parallel to the enemy's front or at right-angles to his flank (see diagram 2). This formation is very simple, A being in a position either to converge or diverge from the axis of his advance as his plan matures.

Suppose now that a second hostile force, B, is introduced, and that C, by closing inwards or falling back, renders a change of direction on the part of A imperative. Is deployment in line of columns applicable? It certainly is not, for, to change direction towards B, A must order a wheel to the left, and, though the inner division will have but a few miles to go, the outer divisions will have a considerable number.

9. THE FORMATION OF THE ECHELONED LINE OF COLUMNS

Is there no other formation which will enable A to march against C, and, if necessary, rapidly change direction towards B? Yes, there is the echeloned line of columns, on occasion made use of by Gustavus Adolphus. The formation of the echeloned line of columns (see diagram 3) enables A rapidly to engage C with his entire force, and equally rapidly to change direction towards

B, if such a change is demanded. Thus, if the marching front of the six divisions is fourteen to eighteen miles—that is, about two and a half to three and a half miles between divisions—and the depth echeloned back from the head of the leading division to the

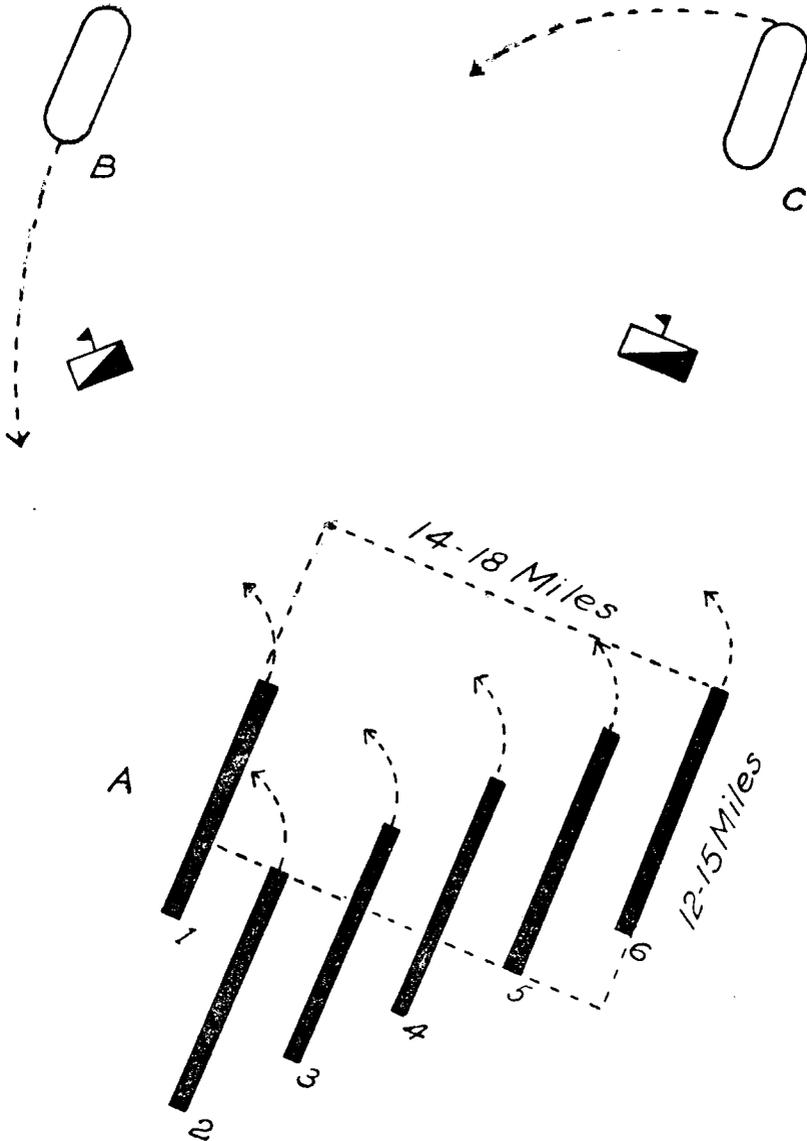


DIAGRAM 3.—COLUMNS IN ECHELON

head of the rearmost be from twelve to fifteen miles, then, if a change of direction from C to B becomes imperative, this change can immediately be made by wheeling the head of each division to the left. The division on the exposed flank should be slightly in advance of the one next to it, in order to allow of the formation of a general advanced guard to cover the change of front.

If such a change of front is impossible, on account of the closing in of B and C, A may, if he still thinks fit, carry out his attack

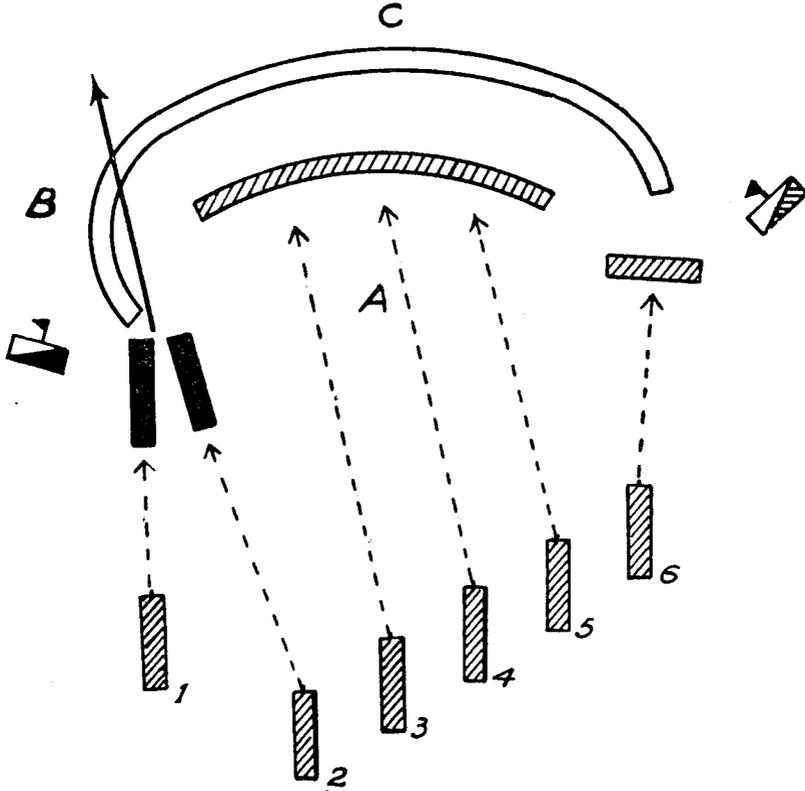


DIAGRAM 4.—CONCENTRATION AGAINST AN ENVELOPING FLANK

whilst holding back B with his cavalry, supported by the 1st and 2nd divisions, or engage C with the 3rd, 4th, 5th, and 6th divisions, allow B to begin enveloping this attack, and then attack in strength B's right flank—in other words, envelop the enveloper.

If, again, B and C unite prior to encounter, A would do better, should time permit of it, to form a triangular lozenge somewhat similar to Marshal Bugeaud's triangle at the battle of Isly (1844) against the now-converging semicircular line, and either hold

back its wings as they begin to clinch and penetrate its centre or hold back its centre and destroy its wings by taking them in enfilade (see diagram 4).

Supposing, now, that A detaches one cavalry and one infantry division to operate against B, whilst with the remainder of his force he attacks C, I will examine what factors, outside march formations, will affect his deployment.

Directly a commander knows where his enemy is and when he will meet him he can no longer delay, his plan of action must be

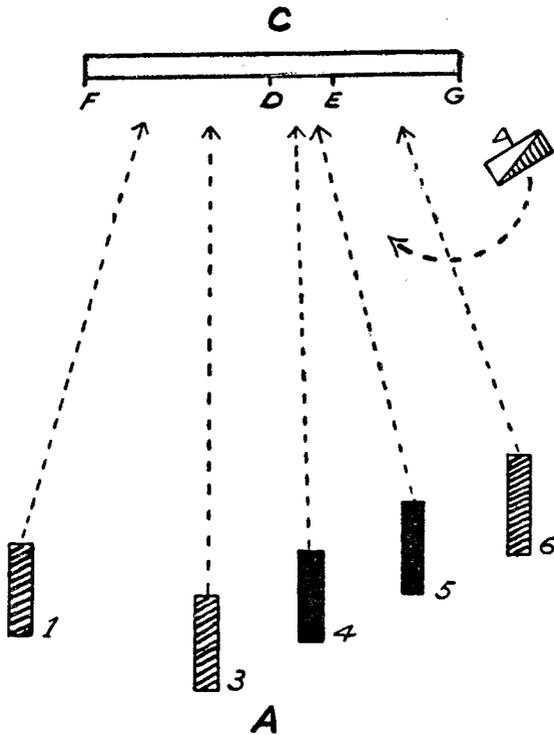


DIAGRAM 5.—CONCENTRATION AGAINST THE CENTRE

formulated, zones of attack must be allotted, the frontages of these zones depending on the probable intensity of the fighting which is likely to take place in each, as well as their relative tactical importance and natural strength. Where is the decisive blow to be struck? This is the keystone of every deployment. If this question cannot be settled before severe fighting takes place, zones of approximately equal size must be allotted to a certain number of units, whilst other units are kept back to reinforce

any such zone wherein a decisive advantage is being gained. This will mean that the whole force will not strike together ; a separation will take place between the holding and the decisive attacks, which is undesirable. Can this defect be obviated ? Certainly, by apportioning zones of action to each unit, the frontages of which are in proportion to their tasks. Thus, suppose that in diagram 5 the area DE offers the main tactical advantage, then the 4th and 5th divisions might be directed against DE, whilst the 2nd and the 3rd hold FD, and the 6th EG. When deployed, the effect will be that of depth opposite the decisive point (see diagram 6) ; this point being, not neces-

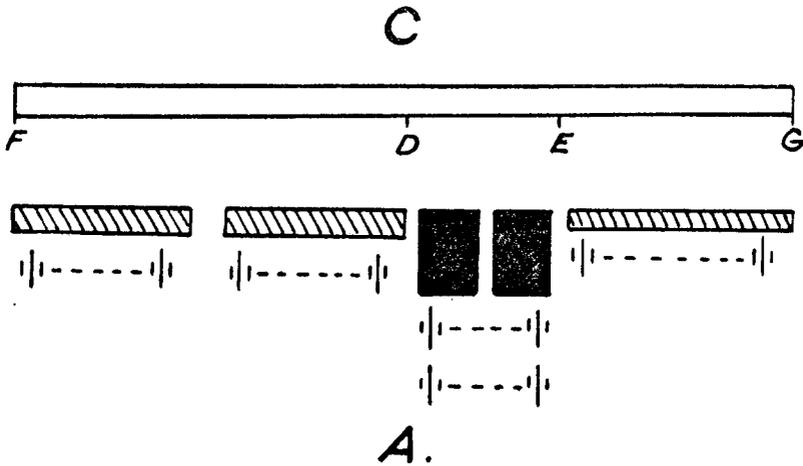


DIAGRAM 6.—ARTILLERY CONCENTRATION AGAINST THE CENTRE

sarily where the enemy is in least strength, but where A can develop the fullest power of all his weapons combined and simultaneously. If such a point is found, I will suppose near the enemy's left flank, well and good ; the only difference is that FDE will be held by three divisions, whilst two deliver the decisive blow against EG. If such a point cannot be discovered, and time permit of it, an artificially weak point may be created by causing C to weaken one of his flanks, for example, the right, by a threatening envelopment by means of the 2nd division, whilst the 3rd and 4th converge on the weakened section FD (see diagram 7).

In the above formations and movements it should be noted that the security of A's army does not depend on detachments or a general advanced guard, but on ability to attack in bulk and at the shortest possible notice. Co-operation is based on unity of action.

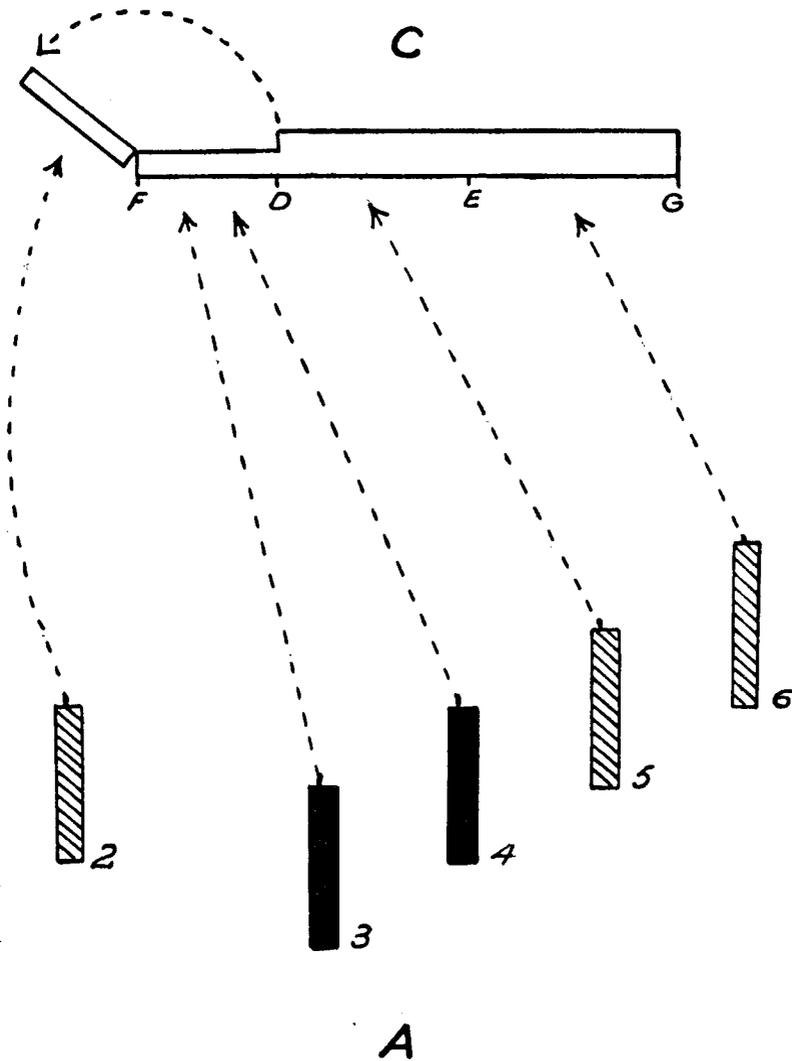


DIAGRAM 7.—CONCENTRATION AGAINST A WEAKENED FLANK

10. THE LOZENGE FORMATION

The echeloned column formation is an army formation, and in my example I have dealt with an army of six divisions. If we multiply this number by ten we get an army of sixty divisions,

and with such a force it would manifestly be unsound and cumbersome to attempt to form it into an immense phalanx of columns, echeloned or otherwise. This is virtually what the Germans attempted in 1914. With large armies what is required is distribution of force and combination of movements. Napoleon

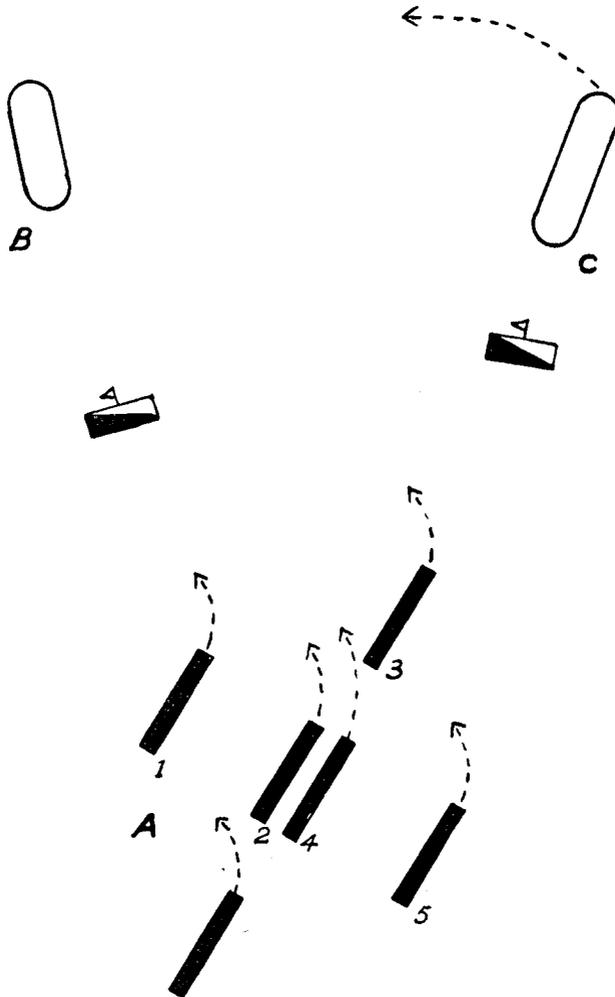


DIAGRAM 8.—THE NAPOLEONIC LOZENGE

understood this well, and he frequently made use of a lozenge formation (see diagram 8). This formation normally consisted of a general advanced guard, two wings, and a central body;

sometimes a rearguard was added. The main advantage of such a distribution is that, whether the enemy is met in front on the right or on the left, he can be engaged by a strong force which will compel him to deploy, and which can hold him until one or more of the other forces are able to concentrate against him. Thus, if the advanced guard first gains contact, the wings can manœuvre towards the enemy's flanks and the central body towards whichever point becomes the decisive point; the rearguard remaining in reserve. If the right or left wings come into contact, an exactly similar series of manœuvres can take place. The great advantage of the lozenge formation is that it combines security and offensive power through movement.

For small forces this formation is well suited to a country in which roads are few and bad. Its main defect is its depth, which scarcely permits of a lozenge of six divisions coming into action on the same day. Consequently in an encounter battle its divisions are liable to become engaged piecemeal. In diagram 8 the 6th division is badly placed for a movement against C, and the 5th division is equally badly placed if a wheel has to be made towards B.

II. THE FORMATION OF MOTORIZED ARMIES

I have now outlined the three main strategical formations—paralleled columns, echeloned columns, and lozenge. I have not discussed their tactical advantages and disadvantages. Personally I believe that the defensive power of modern weapons is so great that frontal attacks are no longer reasonable, unless they can be carried out by armoured troops. Further, I believe that, as armour can be carried by machines and, consequently, men can be rendered invulnerable to bullets, it is only rational to suppose that armour will be used. If this is a correct deduction, then the following question arises: If armies are motorized—that is to say, should cavalry and infantry be replaced by tanks and armoured cars—will the above strategical formations prove suitable? Not only will they prove suitable, but much more flexible, for the geometricity of their form, which is most difficult to maintain when roads have to be followed, becomes a fairly simple question over normally open country. Further than this, the restriction imposed by roads being modified, columns, if necessary, can be reduced in depth by broadening their fronts until the maximum breadth of frontage is attained by forming into line. This broadening of their fronts enables them to increase their locomobility by becoming more concentrated. Thus the

formation shown in diagram 9 might replace that shown in diagram 3. The *total* frontage is not increased, but the depth of the army is considerably decreased.

Besides this ability to move concentrated, mechanical armies possess the power to move extended. When the position of the enemy is known, this will enable the difficulty noted by Napier—namely “of knowing when and where to extend the front”—to

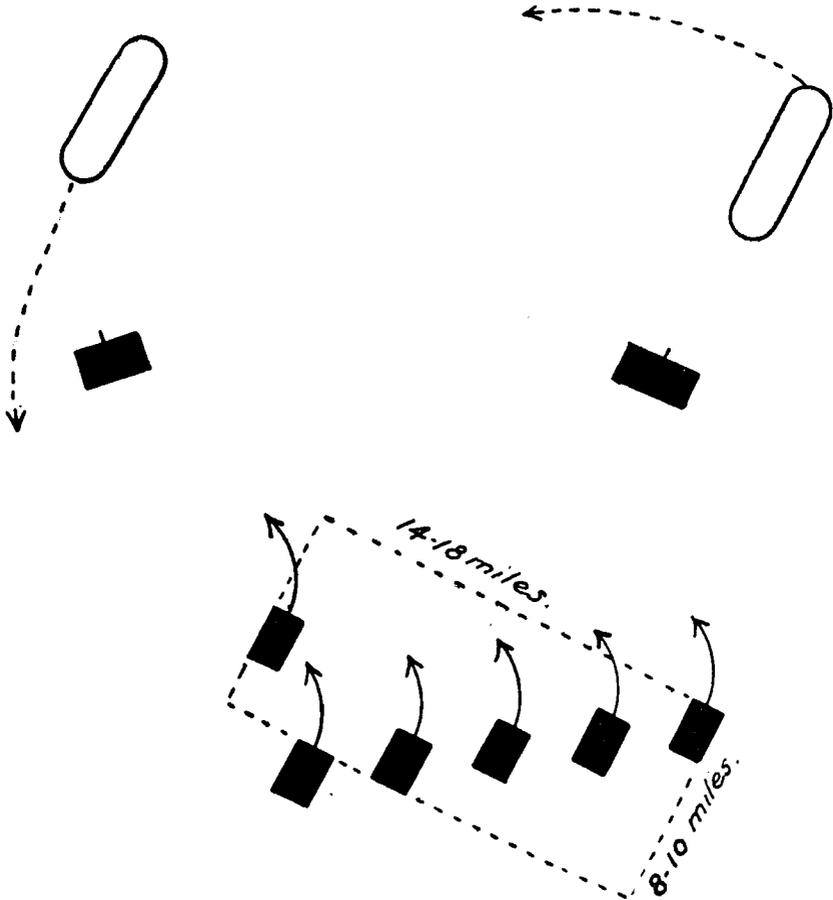


DIAGRAM 9.—MECHANICAL COLUMNS IN ECHELON

be overcome. Normally, however, that is when uncertainty exists as regards the strength of the enemy on the line of his advance, it would appear that mechanical armies will have

12. THE THREEFOLD ORDER OF TACTICAL ACTION

I will now turn to tactical action, which is developed from strategical formation and distribution, and I will descend to minor tactics.

By strategy an enemy is out-manceuvred ; that is, he is placed in a bad position from which to hit out. First it should be remembered that the purpose of tactics is similar to that of strategy, namely to carry out the intention of the commander—his plan. The instrument is not only the troops but the

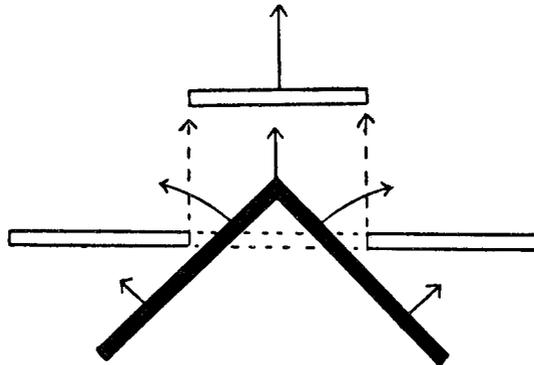


DIAGRAM II.—PENETRATION BY A MECHANICAL FORCE

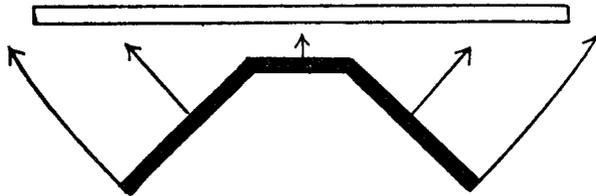


DIAGRAM I2.—OUTFLANKING BY A MECHANICAL FORCE

organization of the troops. Organization *must* be maintained. Further movement *must* be maintained, or at least the power to move must exist when the commander desires to move. We here get as our battle problem the maintenance of a moving *organized* body of men. This body must be able to move, and it must remain organized. The enemy is attempting to stop this movement, not only by killing and wounding our men, but by *destroying their organization*. We must, therefore, protect our men and their organization, and we do so to a great extent through offensive action. By hitting we reduce the chances of being hit.

Tactical action may, therefore, be defined as : protected *organized* movement through offensive action.

To accomplish this we require three orders of troops. Troops which will protect the attackers, troops which can attack, and troops which can pursue. These three orders remain fundamental, and to pull their full weight they must co-operate—that is, work together to attain a common object.

In a present-day army these orders are represented by artillery, infantry, and cavalry ; and the reason why in the last great war a decision was so long delayed was due to :

- (i.) The immobility of artillery.
- (ii.) The defensive strength of infantry.
- (iii.) The offensive weakness of cavalry.

The number of guns employed and the enormous supply of ammunition required tied artillery down to definite areas, and as intensity of fire had to be maintained, and guns cannot fire when in movement, the result was that when they had to move the attack virtually had to be suspended.

The defensive power of infantry and the lack of ability on the part of cavalry to pursue needs no accentuation.

What we have got to do now is to think in the terms of the elements of war and make good the above deficiencies. Thus, artillery must be endowed with a higher power of movement. Infantry must be endowed with higher offensive power, and cavalry must be more highly protected.

I have laid down three orders of troops from the major point of view, now I will examine them from the minor—the tactical organization and co-operation of the attackers themselves.

According to the accepted theory of war, the true attackers are the infantry. They attack from the base supplied them by the protective troops—the gunners—and on defeating the enemy's infantry, theoretically, they form a base for cavalry action. If, from the major point of view, three orders of troops are necessary, so also are they necessary from the minor. Consequently an infantry platoon should be a threefold organization, and it virtually is one. To prove this I will first divide the platoon into two equal parts, a forward body and a reserve—the left and right fists of a boxer. Both consist of two weapons—a protective weapon, the Lewis gun, and an offensive weapon, the rifle. The object of the forward division is to deprive the enemy of power to move, so that the reserve division may *move* forward and destroy him. The reserve may assist the forward body by protective fire, but, in any case, the Lewis-gun section of the forward body should protect the advance of the rifle section.

Thus we find, in miniature, the tactics of an army repeating themselves in the platoon. The forward Lewis gun is the field artillery, the forward rifle section the infantry, and the reserve is the cavalry and horse artillery. But, whilst theoretically the cavalry in pursuit can move faster than infantry in flight, in the platoon battle the reserve cannot do so. Consequently, whilst in the main battle the object of the infantry is to disorganize the enemy's infantry so that the cavalry can pursue, in the platoon battle the object of the forward division is to fix or hold its antagonist until the reserve division can move forward and

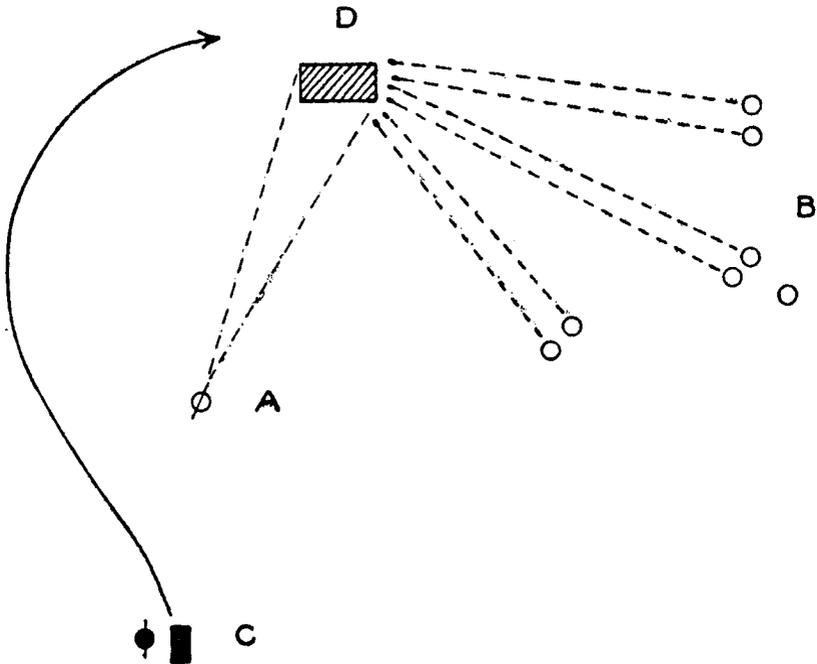


DIAGRAM 13.—THE PLATOON ATTACK

disorganize him. Each time such a disorganization is effected the enemy's battle-body sustains a scratch. In the infantry attack as conceived to-day an antagonist is scratched to pieces.

The diagram (No. 13) shows what I mean. D is the enemy; A is the forward Lewis-gun section; and B the forward rifle section; C is the reserve. Under the protective fire of A, B manœuvres, and through offensive action fixes D. When once D is fixed, C makes the fullest use of movement to manœuvre into a position from which D can be annihilated or compelled to surrender,

Even in so small an action as this we see the close interplay between the three physical elements of war, and, through them, back to the three elements of force. Stability, activity, and co-operation (mobility) demand three types of weapons ; these demand three types of soldiers ; and these soldiers express their combined action in a threefold order of tactics, namely to protect, to fix, and to destroy or paralyse.

Again we get a close relationship between strategy and tactics. The position occupied by A is first of all tactical—that is, offensive ; secondly it is strategical—to cover the movement of B. B's movement is strategical, then tactical ; and so also is C's. If strategy and tactics cannot be separated in the platoon, neither can they be separated in an army. Even if our force comprises three men, one should act protectively, one offensively, and the third in a mobile manner ; even if only one man, he should protect himself with one fist, hit out with the other, and move by leg-power ; and one man is our ultimate model, for one man is our military molecule.

13. THE STUDY OF THE PHYSICAL SPHERE

In the history of war the physical sphere of force has undoubtedly attracted the greatest attention, as it is the most tangible of the three, yet its study has been alchemical, since system has been lacking, and the result has been, and still is, that, when physical organization has proved itself defective, a remedy is sought for by making demands on the *moral* of the soldier. To strike a comparison : if an engine is the physical means at our disposal, and the engine-driver the moral, then, when the engine refuses to move, in place of examining it and discovering the cause, we say to the driver : " Get out of your cab and push it."

To discover the defects, and, consequently, the improvements in the physical sphere, the physical elements of war are our surest guide ; and, if a pass-book will enable a banker to ascertain how a client lives, the forms these elements take in an army will enable a student to discover the mental calibre of its general and higher command. If we see that an army is content with what it has got, this will tell us one thing ; if its heads are seeking for higher protective, mobile, and offensive power, then another. In the past evolution has been slow ; since science has been backward ; but to-day science is leaping ahead, and each leap potentizes the physical sphere, which becomes big with possibilities, so big that it has become not only conceivable but practical for a new weapon to be invented which may give the army equipped with it so great an advantage that nothing can withstand it.

If we value our *moral* as something worth preserving, and the

moral school of war mainly looks upon it as cash—something to be spent—then we must never slacken our endeavours to increase physical force in its three forms, since we do not fight with *moral*, but with weapons. *Moral* sustains fighting power, but it does not deal blows.

What armies are to-day doing so? For one of these armies we shall one day have to meet. The mere addition of new weapons and means of movement and protection must not delude us into supposing that an army is guided by progress, for the "test" of progress is *tactical idea*. How are they being used? This is the question. The answer is to be sought in the training manuals and on the manoeuvre grounds. Here we can learn how they are being used, and then, possessed with this information, we should turn to the weapons and means and ascertain their powers and limitations. Does tactical theory express them? If it does, then we learn that an army is thinking scientifically; if not, then that its command is composed of alchemists. This is a tremendous and decisive discovery to make.

Next we should examine the military structure of organization. Does it admit the true tactical values of the means being expressed, and does it permit of a co-ordination of tactical structure and maintenance, and is it easily controllable?

To be controllable and maintainable it must be simple: Is it simple or complex? Is it growing like the body of a man, or like an amorphous polypus: that is, is each new means accentuating the power of the elements of war by correlation, or by mere addition? If by addition, then we are faced by a monster, and monsters are seldom to be feared.

As the power of each weapon is limited, so also is the force of an organization limited. What are its limitations, and how can they be overcome. These are a very few of the many questions we should set ourselves to answer, and so prepare ourselves for the next war, not merely by studying history, but by examining the existing organization of all armies, including our own.

Then in war we are faced by another series of questions. What is the object, the idea, in the head of our antagonist? Examine his objectives, his strategy and tactics, and at once a hypothesis can be formulated which will link matter to mind, the outer to the inner, and supply us with an answer. Watch this answer, compare it with facts, amend it, recast it, and, little by little, we creep into the very brain of our enemy and see him as he sees us, and learn his strength and his weakness. Thus, by grasping the essential characteristics of the physical sphere, can we learn to understand the nature of the mental and moral spheres, and act accordingly. The physical sphere is, in fact, the alphabet of war.

CHAPTER IX

THE CONDITIONS OF WAR

Perfect uniformity produces no change ; all change arise from some difference, from some alteration of balance of conditions.

—G. GORE.

A choice of difficulties seems a necessary condition of human affairs.—ARCHBISHOP WHATELY.

I. A THREEFOLD ORDER OF CONDITIONS

I HAVE now dealt with the instrument of war and its forces, and more particularly with the military instrument, and though in the main I have had the idea of an army before me, I am of opinion that in principle the examination I have now concluded can be equally well applied to a navy or to an air force. From these forces I will now turn to those which change and modify them, and the causes of these changes I will call the conditions of war, which include every possible cause which can produce an effect in the instrument.

In chapter iii. I stated that the universe is known as a space of three dimensions, which manifests to us in terms of time and force, and that knowledge, faith, and belief are the varying relationships between these three conditions and the mind. In war these three conditions surround us as completely as they do in peace, but as our minds are concentrated on a single and highly specialized problem, namely the waging of a war, they assume relatively a military aspect, and, in order to distinguish them from their more general forms, I will call them military space, military force, and military time. We thus obtain two trinities—the general and the special—the first relative to life as a whole, and the second to war as a special problem. Thus graphically these two trinities can be shown as in diagram 14.

In the first triangle, each change in space, force, and time influences man ; in the second triangle, each change in military space, force, and time influences the military instrument. In the first case, unless the mind of man can grasp the nature of the changes which are bombarding him his life will be the resultant of trial and error ; if he can, then of knowledge. Knowledge will tell him that these changes can assist him, resist him, and

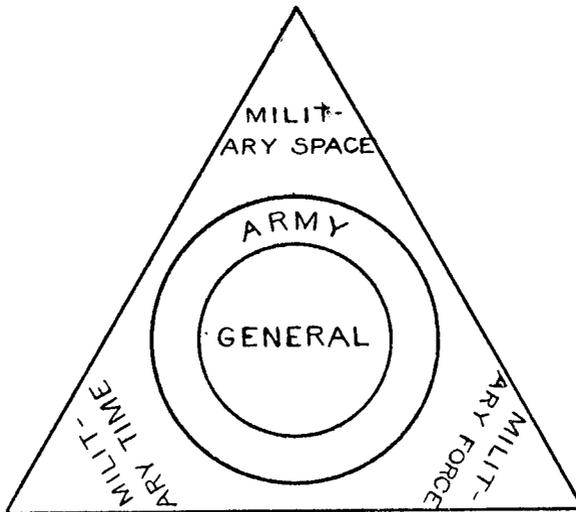
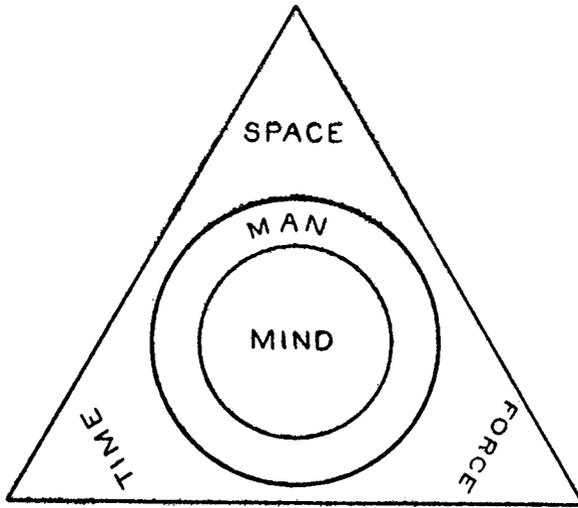


DIAGRAM I4.—THE MILITARY TRINITY

transform him, his transformation being, in fact, the relationship between assistance which is active and resistance which is stable. In the second case it is the same, for if the mind of the general can understand the conditions which are influencing his army he will be in a position to avoid, resist, or turn these conditions to his advantage, and thus strengthen his own army and weaken his adversary's. In fact, he will be able to transform the fighting power of both. Action resulting from such knowledge may be termed scientific action, in contradistinction to action which does not, which is alchemical action.

The number of the conditions of war may be considered as infinite, consequently this rules out of all possibility the power of one mind grasping them as a whole. To overcome this difficulty—or, rather, to limit it—a general is assisted by a staff, the main duty of which is to examine the conditions of war and to deduce their influences. It is in this important work that the scientific method will assist us. I will illustrate this by a quotation :

Mr. F. W. Westaway writes : “. . . with even the closest attention, our observations may be entirely incorrect. Any one of our organs of sense is easily deceived, a fact which enables the magician to make his living. Then it is seldom that we see the whole of any event that occurs : a cab and a bicycle collide, and half a dozen ‘ witnesses,’ all perfectly honest, may—probably will—give accounts which differ materially and may be mutually destructive. It is always difficult to keep fact and influence distinctly apart. In the middle of the night we ‘ hear a dog bark in the street.’ But really all that we hear is a noise ; that the noise comes from a dog, and that the dog is in the street, are inferences, and the inferences may be wrong. For instance, a boy may be imitating a dog ; and everybody knows how easily the ear is deceived in regard to the direction of sound. It is almost impossible to separate what we perceive from what we infer ; and we certainly cannot obtain a sure base of facts by rejecting all inferences and judgments of our own, for in all facts such inferences and judgments form an unavoidable element.”¹

For a moment I will pursue this problem of noises. Suppose, for some reason or another, we wish to specialize in noises ; then we must examine all possible noises in turn, and, though we may never be able to acquire a complete knowledge of all noises, we shall obtain knowledge of a considerable number. Then, when a noise occurs, especially a common noise, such as a dog barking, we shall be able to infer its cause with far greater accuracy, and sometimes even the reason of its cause ; in fact, by a scientific study of noises we shall become experts in the subject.

¹ *Scientific Method*, F. W. Westaway, p. 195.

Turning now from noises to the conditions of war. Though in their totality, they are infinite, or presumably so, we know that those which are constantly repeating themselves are limited in number. From a close study of military history and the psychology of nations we shall be able to deduce by far the greater number of general conditions ; and from a careful study of our own and the enemy's instruments of war and the characteristics of the probable theatres of war we shall further be able to deduce a large number of special conditions.

This will give us a sound foundation to build accurate inferences on, but we must not rest here, for we must ascertain what the probable influence of these conditions will be on ourselves—the mind of the general and his army. It is here that the elements of war can render us true assistance as checks to our judgments. We know that conditions will influence all the three spheres of forces, and that, as each of these spheres contains three elements, one or more of these elements will be affected. Which are most or least affected, or will be so? Once we have answered this question, though we may not have arrived at the truth, our decision is more likely to be true than if founded on mere guess-work.

In brief, every change in the conditions of war produces a change in the forces of the military instrument and transforms it, whether we like it or not. What are these transformations? They are changes in the elements: in the mental sphere—changes in reason, imagination, and will; in the moral sphere—changes in fear, courage, and *moral*; and in the physical sphere—changes in offensive power, protective power, and mobility. Many of these conditions are occult; that is, they are hidden until they manifest; but by far the greater number of the common ones are obvious, such as: a courageous man will fight better than a coward; two men should exert greater force than one; a protected man is not so vulnerable as an unprotected; a concise order is more easily understood than an involved one; night operations are more susceptible to panic and disorder than those carried out in daylight; a surprise attack is more economical than an expected one; a hilly country is less easy to cross than a prairie; an infantry man is useless against a tank; a horse cannot carry as heavy a load as a lorry, etc., etc.

There are several hundreds of these common conditions which recur in every war, and which in the past have had to be relearnt in every war, because the soldier will not, or cannot, think scientifically. Commanding an army, organized, I will suppose, for war on the plains, a general enters a mountainous region and is annihilated, and he cannot understand why. Simply

because he has not foreseen the influence of conditions—in this case of physical geography—on the forces and structure of his instrument. In 1755 General Braddock attempted a Horse Guards parade against Red Indians in the Monongahela forests, and was crushingly defeated. Just before he died he murmured : “ Another time we shall know how to deal with them.” But why wait for next time ? In 1914 we constantly hurled infantry against barbed wire protected by machine-guns ; in 1915 we beat a naval gong outside the Dardanelles, and then ordered our soldiers to land ; in Mesopotamia we forgot to send out an adequate supply of bandages and surgical instruments ; and so on *ad infinitum* ; and why ? Simply because we would not think in terms of the conditions of war, and discover the influence of these conditions on the instrument. “ Pour in sow’s blood, that hath eaten her nine farrow ; grease that’s sweaten from the murderer’s gibbet, throw into the flame ”—that was our method, and yet we were not so successful as the witches in Macbeth.

2. THE CONDITIONS OF MILITARY TIME

The division of the conditions of war into the categories of time, space, and force has at least the advantage of simplicity. Strategically, these categories form the base of all our calculations, and tactically of all our actions, and each may be considered as possessing either an abstract or a concrete mood. I will now very briefly examine these three general categories of conditions from their military aspect.

Time is an all-embracing condition, and in war, more so even than in peace, time must be reckoned in minutes, and not only from a military point of view, but from an economic one as well, since in a war, such as the Great War of 1914-18, every minute of time was costing Great Britain from four to five thousand pounds.

The economy of time becomes, therefore, not only of military but of economic importance ; it is never unlimited in its remunerative sense, and its loss can seldom be made good ; in fact, of all losses it is the most difficult to compensate. One of the greatest problems in generalship is how to utilize time to the best advantage, and this demands a perfectly organized instrument in which friction, which is the enemy of military time, is reduced to its lowest possible level. To understand the time limitations of one’s own side and of the enemy’s is to work from the surest of foundations, and if our organization will enable us to move more rapidly than the enemy, then from the start we possess an immense

advantage over him, for indirectly this organization will enable us to increase the time at our disposal.

Economy of time first depends on thoroughness of preparations, and secondly on stability of policy. If a nation which is parsimonious during peace-time enters upon war unprepared to wage it, it will either succumb to force of hostile superiority or else will be compelled to pay an enormous premium in order to make good its peace-time deficit. A want of preparedness must detrimentally affect any policy, preconceived or improvised. Without fixity of purpose there can be no military stability, for changes in policy are the most fruitful sources of delay. Besides, economically the cost is stupendous, for every hour lost may be £250,000 thrown away, a little less than the price of the upkeep of two battalions of British infantry for one whole year. Again, if full preparations are made during peace-time, and the war, once it has begun, proves to be totally different in character from the war expected, the greater part of these preparations will have been wasted. Thus we see—and especially so in modern times—that, though the soldier frequently blames the politician for refusing to vote more money for preparations, the politician, if he knew anything of war, might well retort that the money is being withheld, not to stop preparations, but to prevent preparations which will prove useless. If in the next war we are confronted by a mechanized army, even if in peace-time we possess ten times the infantry we have, we shall be less well prepared to meet this war than we are to-day, since we shall have squandered millions and millions of pounds.

Time, strategically, is the measurement of military movement; tactically, of muscular and mechanical endurance. Time is, therefore, intimately related to the means of movement, protection, and weapons. These constitute, in fact, the works of the military clock. Time, also, frequently means concentration and economy of force. Thus, if time can be economized, numbers can either be multiplied or reduced, especially if an operation is carried out so rapidly that the enemy is unable to meet it. Superiority of time is so important a factor in war that it frequently becomes the governing condition.

3. THE CONDITION OF MILITARY SPACE

The practical application of time is the utilization of space, which strategically and tactically, since the advent of the aeroplane and the submarine, has become three dimensional. Formerly space, from its military aspect, was two dimensional

as regards tactics and one dimensional as regards supply. The addition of a second dimension to supply, by means of the cross-country tractor, and of a third dimension to tactics, by means of the aeroplane, both petrol-driven machines, has ushered in a new military epoch.

Military spaces can no longer be reckoned in terms of areas which are actually occupied by armies, or which separate them. Formerly, armies had frontages of attack with a tactical space between them, which was contended for, and the importance of which could be calculated by appreciating the value of the tactical features in relation to the enemy's intentions and communications. To-day all this is changing, since armies are rapidly becoming three-dimensional organizations. Spaces have grown to include, not merely battlefields or theatres of war, but whole countries, and so much so is this the case, that it is quite possible to visualize an army holding at bay another, whilst its aircraft are destroying the hostile communications and bases and so paralysing enemy action.

Spaces are now no longer definitely restricted by rivers, deserts, or mountain ranges, for to a great extent these space walls have been surmounted by the aeroplane, which renders impotent so many natural and artificial obstacles, and so frees military time of its greatest spendthrifts.

Spaces include the three mediums of movement, namely water, air, and earth. At present each requires a special means of movement; thus, water requires ships; air, aeroplanes; and land, wheeled or tracked vehicles. Consequently the present restrictions of space require three differently constituted fighting forces—navies, air forces, and armies. Should in the future, however, a means of movement be discovered which will enable one machine to combine the powers of present-day sea, land, and air machines, space, in the military sense, will become universal; its walls will have ceased to exist. The storming of the bastions of space is the greatest military problem of the future.

From purely a land point of view, military space, though measured in miles, kilometres, etc., should generally be considered with reference to resistance; just as time should be considered with reference to the probable intentions of the enemy. Thus, in an entrenched battle our line of trenches may be separated from the enemy's by a hundred yards, yet if the intervening space be well wired it may take longer to cross it successfully than one hundred miles of open country. Space, like time, in its military aspect, must always be equated with force, and the conditions which assist, resist, and transform force.

4. THE CONDITIONS OF MILITARY FORCE

I have dealt at such length with military force as a compound of nine elements operating in three closely related spheres that it is not necessary for me to return to this subject ; in place, I will examine the conditions which influence the interplay between the two forces represented by the two military instruments—the enemy's fighting forces and our own. In each sphere we find two sub-categories of conditions—the natural and the artificial. For instance, in the mental sphere we have the genius of the commanders, which may be considered as natural mental conditions. We also have the machinery of information, which is an artificial condition. In the moral sphere of force we have racial character, which is natural and training, which is artificial ; and in the physical sphere we have weapons, means of protection and of movement, which are artificial, and ground, weather, and geographical conditions, which are natural.

It is obviously impossible for me, within the limits of a single volume, to examine in any detail this host of conditions ; consequently I will restrict myself to a few general remarks on each of the three categories.

5. THE MENTAL CONDITIONS OF WAR

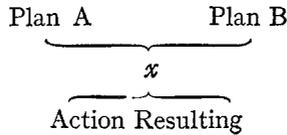
The mental conditions of war, though shared between the general and his men alike, are of supreme importance to the former, just as the physical conditions are to the latter. The general is the centre of greatest responsibility ; and command, as I have shown, is as much a matter of self-government as of the government of others ; it is he, in fact, who fights, and he fights with his brain ; and if he wins, he reaps the glory of victory, and if he loses, then the ignominy of defeat. Responsibility in war is the heaviest load any man can carry ; to suggest is easy, to do is indeed hard.

The conditions of war are appraised by the general, or at least they should be, for his staff is only a sorting-machine which in no way can relieve him of his responsibility to decide. His plan must in every way be his own plan, whether he has devised it himself or borrowed it from another, and, be it remembered, there is nothing wrong in borrowing ; much has to be borrowed in war, and history offers us innumerable suggestions. What is wrong is merely to copy without reference to conditions ; equally is it wrong to initiate without this reference ; conditions

are, therefore, the spirit-level and plummet-line of a general's plan.

A plan of war is always confronted by another plan, however vague it may be, and between the two plans lie the conditions of war which, to the opposing generals, are very largely mental in character. These conditions may be considered as the unknown x in an equation, and on the plus and minus values of this x will the actions of both sides depend.

Thus, diagrammatically, this may be shown as follows :



What, now, does x represent ?

It represents to a very large extent the influence of the enemy, of the instrument, and of the general's native *moral*.

As to the value of the first, this is almost self-evident ; as the pressure the enemy brings to bear rapidly becomes felt, and is frequently understood in the physical and moral spheres of war. Yet in the mental sphere its understanding is often vague, since only the greatest generals, and then more through intuition than reason, have grasped the mental conditions which surround their adversary. Is he a free agent, or a mere political tool ? Is he an artist, or a mere mechanician ? Does he believe in the doctrines promulgated in his army, or does he not ? Is he the slave, or master, of his staff ? And, above all, is he a man who has studied war scientifically, or alchemically ?

In 1914 I much doubt whether any single general possessed more than a passing knowledge of his enemy's or ally's commanders. Did General Joffre really understand General French ; or General French, did he understand General von Moltke ? I make bold to say that not one out of ten generals in the British army had ever heard of either von Moltke or Joffre ; yet they were training their men to fight the Germans and to co-operate with the French. They thought, if they thought at all—and through no fault of their own, but because of the system in which they worked—of the physical side of the approaching war, to the complete exclusion of the mental. Like drill instructors, they taught their men to aim and to fire, or they watched others teaching them, but they paid no attention—or very few of them did—to the mentality of their enemy's command, and they never drilled themselves into understanding that, when it came

to battle, it was going to be a fight between their ideas and their opponents' ideas, and not merely between their men and the enemy's. To us these mental conditions were all but a complete blank, because we had never troubled to study character, and to-day we still have no machinery wherewith to do so.

The mental conditions of the instrument—the will of the Government, the will of the staff, and the will of the soldiers—all act and react on the will of the general. Is he proof against these influences, and can he maintain his own equilibrium? Consider his surroundings. His staff may or may not be of his own choosing; in any case, they are all very human; some are self-seekers, some are sycophants, some are full of ideas, and some are mere grit in the machine; yet, however efficient or inefficient they may be, not one of them can share the responsibility of the general, though all can influence his will, unless this will be of steel. If he is a judge of character, and if he possesses a deep knowledge of human nature, the general will understand the mental conditions which surround him; mere stubbornness will not do this. To refuse to listen to advice is not a token of strength, but of stupidity, a vice only second to that of weakness. It is through an intelligent grasp of his surroundings, the mental conditions which form the instrument of his work, that a general succeeds in freeing his will from obstruction. If his men murmur, and he knows why they murmur, he can act rightly; and if his staff suggest, and he knows the character and mental calibre of each member of his staff, then will he know the psychological value of each suggestion. Finally, he must understand his own moral force and work within its limits. This of all his problems is the hardest to solve.

As regards the men he commands, they must understand the use of the physical elements, and not merely possess skill in their use. A condition suddenly manifests—it may be a clump of trees seen from a rise in the ground, or an unexpected trench, or an unlooked-for machine-gun, or one of the ten thousand minor conditions which incessantly ripple over the battlefield. Does every man understand simultaneously what each of these conditions means, and its influence on the situation at the moment? For unless they do understand them their skill will to a large extent be wasted. Not only must they understand them from their point of view, but from that of the enemy, so that they may equate the two series of factors resulting and arrive at a true decision. And, when they have decided, will they act? This depends on the condition of their *moral*, and generally this is a question for their leaders to decide.

6. THE MORAL CONDITIONS OF WAR

As I have examined at some length the moral sphere of war, I will deal very briefly with the moral conditions, which in general terms must be understood by the commander, and in detail by the leaders of the men themselves.

It must be remembered that all conditions—or very nearly all—influence the soldier morally by stimulating either his courage or his fear ; for, whilst some affect war materially, such as roads for supply and the influence of gravity on the flight of projectiles, thousands directly stimulate the instincts of the soldier, and through his instincts his mind, and through his mind his actions.

Examining this question from a very general point of view, the various moral conditions of war may be divided into three main groups, namely :

- (i.) Those which are general ; that is, those which influence men individually and collectively.
- (ii.) Those which more especially influence the individual.
- (iii.) And those which more particularly influence a mass of soldiers as a homogeneous crowd.

The following are examples of these groups :

(i.) *General Conditions* : Safety, comfort, fatigue, catchwords, loyalty, honour, faith, hatred, love, admiration, cheerfulness, etc.

(ii.) *Individual Conditions* : Knowledge, leadership, command, skill, determination, reason, endurance, courage, self-confidence, stubbornness, sense of duty, etc.

(iii.) *Collective Conditions* : Suggestion, intuition, instinct, superstition, esprit-de-corps, tradition, example, religion, education, patriotism, comradeship, etc.

It is not possible to draw a hard and fast line between these conditions, for they overlap, and I do not propose to analyse them, as each would require a separate chapter. Nevertheless it must be realized that, unless these conditions are understood, it is not possible to apply efficiently the principles of war, and, unless all the conditions which go to build up soldiery have been stabilized prior to the outbreak of a war, a general will not possess a stable vehicle for his will to move in. The process whereby this stability is gained is called training. Training forms the true foundations of battle which, just as war should

be a continuation of peace policy, should, in its turn, be a continuation of peace training. War is, in fact, the examiner of all our work.

For this to be possible it will at once be seen that training must be based on :

- (i.) The permanent characteristics of man.
- (ii.) The permanent characteristics of war.
- (iii.) The probable conditions in which the next war will be fought.

These conditions must be foreseen, and, as war is an evolution of civilization, the tendencies of civilization must be discovered. On the correct forecasting of the nature of the next war will depend the continuity of peace training when war breaks out, under the changed form of battle tactics.

There is really no great difficulty, if application be made, to foresee, with a fair degree of accuracy, the tendencies towards improvement in weapon design, etc. ; but, unless the psychology of war has been carefully studied, there is a distinct difficulty to forecast the moral conditions, new weapons, etc., will give rise to on the battlefield. Thus, for instance, a tank can undoubtedly assist an infantryman to capture a machine-gun, but will this increase the courage of the infantryman? Not necessarily; for, in place of stimulating his courage, the fact that the tank is invulnerable to machine-gun fire will throw him back on his reason and imagination, and he will say: " This machine is quite capable of dealing with the machine-gun; why should I risk, therefore, my life by following it closely? I will wait until the tank has destroyed the enemy, and then I will advance and occupy the position." This is common sense, and we must understand such conditions as these, for otherwise we may, during peace-time, when the instincts are not aroused (because of the absence of danger), determine on tactics which demand close co-operation between tanks and infantry, and then, during war-time, we may discover that the infantry *will not* closely co-operate, and our tactics break down, because they are not harmonized with the moral conditions created by the tank in this special case—the infantry attack. There are hundreds of these problems which face us to-day.

7. THE PHYSICAL CONDITIONS OF WAR

The physical conditions of war permit of a definite distinction being made between the artificial and the natural. In the

former category we have the two opposing instruments, each comprising weapons, and means of protection, of movement, and of supply, of repair and of transportation ; each creating strategical, tactical, and administrative conditions, which affect mutual changes in force and in organization. In the latter we have geography, topography, and climate, and also in this category may be counted communications, political centres, and industrial areas, for, though these are not natural conditions, they lie outside the province of military control.

To examine with any completeness the various physical conditions of war would demand, not only a book, but a series of books ; obviously, therefore, I cannot do more than accentuate their importance. Lloyd considered that the theatre of operations is " the great and sole book of war." This, within the limitations of the physical sphere of war, is a correct statement. During war we have little time to read this book, and, unless we have closely studied it before the outbreak of war, the application of our means will be profoundly restricted.

In this study the civil sciences can help us, and are progressively becoming, not mere handmaids of the soldier, but his closely collaborating partners. To render this collaboration possible it is most necessary for the soldier to realize that, though he is the expert authority on the application of means, the scientist is the expert authority on their creation. The problem which faces the soldier is how to adapt action to circumstances. Circumstances are the conditions of war ; action is the use of the military instrument. The instrument cannot be omnipotent ; consequently its powers, however formidable, must be limited. What are these limitations, and how will conditions affect them ? This question can only be answered by discovering what the nature of the conditions is. This is still a military problem. We know, or should know, with fair accuracy the conditions of the last war, the nearest war to any war which to-day confronts us ; but, however full our knowledge may be of this war, we must never forget that a war to-day, or a war to-morrow, even if fought over the same theatre as the last war, will not be the same, even if military science and art has stood completely still during the intervening period.

The reason for this is that, however lethargic the soldier may be during peace-time, it is during peace, much more so than in war, that the struggle for scientific knowledge and industrial survival is acutest. Each new discovery, each new invention, by modifying the forces of peace modifies the force of war. The soldier must understand these modifications, because in the next war they will confront him as actual conditions. The next

war is his supreme problem. An examination of national characteristics and international politics, of peace treaties, of frontiers, of economic influences, and of ethical ideals, will enable him approximately to arrive at the date of the next war and to define its theatre. Suppose all these tendencies point to a war against Russia between the years 1935 and 1940, here, then, is a sound hypothetical base to work on. What will be the conditions of this war? To arrive at an answer we must analyse the existing world situation and discover its political and scientific tendencies. Once these tendencies have been discovered, we must work synthetically, and, guided by our hypothesis, project these discoveries into the future. Here the political philosopher and the scientist can help us. We can ask questions; they can give us provisional answers. With these in our mind we can first compare the limitations of our existing military instrument with the most probable conditions which will confront us in a war with Russia between the years 1935-40. Secondly, we can fall back on our provisional answers and modify the powers of the instrument. We shall then arrive at the conception of a hypothetical instrument, varying from the existing one in characteristics *a*, *b*, *c*, *d*, etc. Suppose *a* represents a gas-proof tank, *b* an aeroplane with a radius of action of one thousand miles, and *c* a persistent gas which will remain potent for one month, then we can turn to the scientist and say, Here are three problems to solve; solve them!

We now have got a clear idea of what we want; that is to say, we have an object in our heads and an objective as our goal; what must we next do? Not merely wait for the scientist to give us what we want, but to think out first the tactical use of these new inventions, and, when our tactical ideas are clear, secondly, to change gradually the structure of the military instrument so that it may become an efficient vehicle for the full powers of these new weapons to express themselves.

But suppose we have made a political miscalculation. Suppose in 1937 we are at war with Germany and not with Russia. Conditions will certainly be different, though perhaps not radically so. This is a possibility we must not overlook; therefore we must take each possible, even if not probable, war in turn and arrive at its conditions, and through these at the changes in our military instrument. These must be compared and correlated. Those which are found to be contradictory or mutually incompatible we must examine in the light of our imagination, guided by our hypothesis of the most probable type of war, and to those which only disagree in detail we must apply our reason and so discover an answer.

To-day no army in the world possesses a general staff which can think in the terms I have outlined, yet one day some nation, I am convinced, will possess one, since it is but common sense that it should possess one, for its cost is insignificant. In our own case, the money we yearly spend on the Bermuda garrison would, I imagine, go a long way to pay for its establishment.¹

8. THE CONDITIONS OF GROUND

I propose now to turn to the natural physical conditions and examine only three, namely ground,² weather, and communications, and merely as examples, for the number of important natural conditions is very great.

The practical expression of space is ground, in which to-day are to be sought the main obstacles to movement in land warfare. Ground may be divided into three main types :

- (i.) Mountainous country.
- (ii.) Undulating country.
- (iii.) Plain lands.

The nature of each of these types is normally governed by water. If water be abundant, the following conditions are generally met with :

- (i.) In mountainous country : swift rivers, unsuitable as communications, and wooded valleys.
- (ii.) In undulating country : large rivers as great thoroughfares, and towns and scattered villages.
- (iii.) In plain lands : an extensive network of rivers and towns and scattered farmsteads ; or few rivers and consequently desert regions.

The influence of water on the soil itself and the influence of soil on civilization are most marked. Thus, where the rainfall is normal, flat countries will usually possess a high water-level, and undulating countries a low one. This frequently means that in flat countries the inhabitants will live in scattered houses and farms, and that in undulating countries they will live in villages, the houses of which are congregated round a few communal wells.

¹ In 1925 the cost of the garrison of Bermuda was £119,300, £28,800 being spent on Royal Artillery, the men of which were costing £327 a head. During the same year the garrison of Mauritius was costing £34,700, of which £23,100 was being spent on Royal Artillery.

² Clausewitz has many interesting remarks to make on ground. See his *On War*, vol. ii., pp. 120, 121, 127, 128, and 238, and vol. iii., p. 183.

From a tactical point of view this will mean that flat countries are usually good defensive areas, and undulating ones good offensive areas, as the latter will offer fewer natural and artificial obstacles. The meshes between the knots—the villages—will be bigger than between the farms, consequently movement will be facilitated.

The influence of ground on military organization is considerable, and one of the greatest difficulties of the army organizer is to fashion an organization which will be sufficiently elastic to prove suitable in all natures of country. This in the past has proved almost as difficult as squaring the circle, but to-day the solution to this problem would appear to be rendered possible by the aeroplane and the cross-country car which, by replacing muscular endurance by mechanical energy, will to a great extent annul the differences of ground, by rendering movement over, or on, the various types more feasible.

9. THE CONDITIONS OF WEATHER

Weather is not only to a great extent a controller of the condition of ground, but also of movement. It is scarcely necessary to point out the influence of heat and cold on the human body, or the effect of rain, fog, and frost on tactical and administrative mobility; but it is necessary to appreciate the moral effect of weather and climate, for in the past stupendous mistakes have resulted through deficiency in this appreciation.

Human nature, as I pointed out in chapter vi., is continually influenced by its surroundings. These surroundings vary considerably, not only in the theatre of war, but throughout the armies operating in it. I will illustrate what I mean by an example.

A battle is being fought on a hot day. The temperature on the battlefield is 100° in the shade; consequently the soldiers are directly influenced by the heat. A few miles behind the front the headquarter staff officers are seated in a house in which the temperature is 80°. They may be working under electric fans; they are not carrying 50lbs. on their backs, and are probably in their shirt-sleeves. If they are thirsty, they can call for a drink. The conditions in which the battle is being controlled and those in which it is being fought are diametrically opposite.

Unless the headquarter staff have intimate experience of the conditions surrounding the fighters, two types of battle are likely to be waged—the first between the brains of the army and the enemy, in which case this action will be rendered impotent on account of the muscles being unable to execute the commands of

the brains ; and the second between the muscles and the enemy, which battle will be disorganized, not so much through the enemy's opposition as through the receipt of orders which are impossible to carry out.

It will be said : " But it is the duty of the headquarter staff to keep in intimate touch with the fighting troops." Of course it is ; but there is a great difference between laying down a duty and carrying it out, especially during war-time.

Instead of placing the staff in similar conditions to those prevalent on the battlefield it is the first duty of the military designer to create an army which will enable the soldier on the battlefield to be placed in conditions resembling, so far as possible, those the staff are situated in. The object is not, therefore, to accentuate the discomfort of the whole, but to minimize the discomfort of the part, and in the above example this means that the temperature of the muscles must be brought down to that of the brains.

At first thought this might appear to be an impossible problem ; on second thought it will be realized that it is not so if the soldier is provided with a means of movement which will enable him to bring with him on to the battlefield such comforts as will square the difference. To-day the cross-country tractor, or the tank, will enable him to go into action with an electric fan and a whisky and soda. Further, the tank will force the headquarter staff to get into similar machines in order to keep up with the fighting troops, so that the equation will be still more completely solved.

10. THE CONDITIONS OF COMMUNICATIONS

Closely related to ground and influenced by weather are communications, which are even more important administratively than they are strategically, for the supply system of an army may be compared to the blood of the human body—it constitutes, so to speak, the vital fluid which keeps the whole organization alive. With masses of men the maintenance of supply unavoidably becomes of greater importance than tactics. The army has got to live in order to fight, and, as living is most difficult, supply consequently becomes its primary problem and fighting its secondary problem.

Communications may be divided into three categories :

- (i.) Strategic communications.
- (ii.) Administrative communications.
- (iii.) Tactical communications.

Each or all may include means of movement by air, sea, or land, and land communications depend, in civilized warfare, on roads, railways, rivers, and canals, all of which are in nature one-dimensional. Ever since the introduction of the wheeled cart this linear nature of communications has been one of the controlling conditions in land warfare.

The restrictions which the one-dimensional nature of land communications has imposed on the strategical, administrative, and tactical movement of armies have been stupendous, the difficulties steadily increasing with the growth of armies, in spite of the invention of the locomotive and the lorry.

During 1914-18 this limitation was the predominant factor of the war; it was no longer a question of manœuvring to protect communications, but of increasing communications in order to move. Road-capacity was the controlling condition, and so it is likely to be in every future war, unless roads can be dispensed with and land communications made in nature two-dimensional by means of cross-country traction. This means, supplemented by the three-dimensional power of the aeroplane, will revolutionize totally the administrative organization of armies.

II. THE DUAL POWER OF CONDITIONS

In the first section of this chapter I stated that every condition of war possessed a dual power, namely, of assistance and of resistance to the instrument of war. For instance, if an army is organized for war in open country a mountainous region is apt to resist its organization, and an open one to assist it. Physical conditions, such as woods, hills, defiles, rivers, swamps, etc., can be used, therefore, to accentuate or lower the power of the instrument, just as various materials can accentuate or lower the power of a tool. If we want to bore a hole through a piece of steel we use a drill suitable for this purpose, and not a bradawl. To a general, the conditions of war are wood or steel, and generalship largely consists in compelling an enemy to bore holes through the latter whilst we are boring holes through the former. To do so, a general must possess knowledge of the conditions of war. He must know all he can before war is declared, and discover all he can during its progress; consequently observation, information, and reconnaissance are essential factors in war.

Information must be collected, evaluated, and correlated with the forces of the instrument, and action must be planned to assist in this correlation. If we turn to the history of war, we shall

discover that a commander has three means at his disposal in order to deal with a condition :

- (i.) He may avoid it.
- (ii.) He may force it aside.
- (iii.) And he may turn it to his advantage.

The third course, which masters the difficulty, is manifestly the best, and it is the one which even a superficial study of military history will show us was employed by all the great captains of war ; it was, in fact, the keystone of their success. To turn conditions, however adverse, to advantage, is, in fact, the test of good generalship, and to do so we must understand the relationship between pressure and resistance. This brings me to the law of economy of force.