The Tactics of Field Artillery....

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THE TACTICS OF FIELD ARTILLERY

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There is sometimes an impression among officers who have not had occasion to consider the matter particularly, that Artillery is a purely technical arm, and has little use for tactics in the broader sense. It seems at first sight that it has only to move forward in some sort of decent order,—which is a matter merely of Drill Regulations,—and then take up a suitable position and open fire,—both of which duties require a knowledge more technical than tactical.

This impression has perhaps been strengthened by misinterpretation of two well known quotations from Hohenlohe's "Letters on Artillery". The first is,—"Judging from my own experiences in war,—and you will own that in matters connected with Artillery they are fairly numerous,—the only movements which are of use in the field are, the advance in column of route, deployments, and the advance in line". The second is,—"The Artillery must in the first place, *hit:* in the second place, *hit:* in the third place, *hit.*"

These two sentences, by themselves, would seem to support the idea in question; but of course they do not when taken with their context. True, the movements required of Artillery on the battlefield are simple, and the guns are worse than useless if there be a lack of the technical knowledge necessary to establish them in position and range them properly; but tactical knowledge in the broader sense is required to control all these technical operations. Not only must all be skilfully combined to accomplish the

required tactical purpose, but the manner of combination must be adapted to the corresponding operations of other troops; for Artillery is an auxiliary arm, and its business is to assist and support its Infantry.

Thus there arises a complete system of Artillery tactics, consisting of the principles by which a commander should be guided in making these combinations of technical operations.

The guns themselves must be moved and fought, as Hohenlohe points out. This is the technical foundation, and this duty falls in the main upon the battery commanders. As we follow up the chain of command, to the Chief of Artillery and the Commander-in-Chief, the technical duties grow less and less, and the tactical duties greater and greater.

Naturally enough, such a tactical system is deeply affected by changes in technical methods, and these methods must always adapt themselves to the materiel with which they have to deal.

Now, Artillery materiel has been greatly changed in the last few years, and the methods of handling it have changed with it. The question naturally arises, whether the whole system of Artillery tactics has not thereby been overturned, necessitating the development of an entirely new one; and many students of the subject are inclined to answer in the affirmative.

But this view seems a trifle one-sided. It takes account only of the changed tool, not of the unchanged purpose, which is to help the Infantry to win battles.

The means by which Artillery gives this help is always fire action. The methods of developing the fire are nowadays widely different from those of a few years ago, and its power is much increased; but the nature of the fire itself is the same. *Prima facie,* then, ought we not to expect to find the old system of tactics modified, rather than revolutionized?

A great deal of study is naturally being given the question now, when the re-armament with rapid fire guns is approaching completion throughout the world; and as usual there are extremists on both sides, —ultra-conservatives and ultra-radicals. But it is believed that in the final solution of the problem, the old broad principles will be found to remain, the details being modified to conform to the altered conditions. Study of the Japanese regulations, under which such excellent work has been done in the late war, supports this belief.

Since Artillery always fights in line, and at a halt, the choice of position becomes of paramount importance. The convenience with which indirect fire may now be employed makes it much easier to put up with a poor position than formerly, and renders it possible to use guns with some effect from almost anywhere within range of the target; but most of the old rules for choice of a position still hold good, and the best position will be the one which most nearly satisfies the requirements of those rules. The following are the principal things to be sought:

1. Good cover; a ridge, behind which guns may be placed out of sight, is usually sought; but trees, bushes, or high standing grain, completely concealing the battery, are also good.

2. Clear, open ground to the front and flanks, giving the greatest possible range and the broadest possible field of fire.

3. Good stations for the observation of fire.

4. Good aiming points, in case of indirect laying.

5. A front generally perpendicular to the line of fire.

6. Sufficient space to allow the deployment of all the batteries that it is desired to use.

7. Firm soil, to resist the wear and tear of the firing.

8. Easy access from the rear, convenience of moving to the front, and good lateral communication, —all under cover.

The relative importance of these desiderata depends upon circumstances,—upon the purpose in view, the nature and extent of the target, and the disposition of friendly troops.

The most careful reconnaissance possible should be made, before deciding upon a position. Dismounted as well as mounted examination of the ground should be made; and observation from the direction of the enemy is very desirable.

Such reconnaissance is easily made in the case of deliberate occupation of a defensive position. But on the march the matter is not so simple, for such work takes time. If the advance guard meets with serious opposition, and it is necessary to bring up Artillery to its assistance, the Artillery commander will not be able to do very much before his guns are ready to come into action.

In order to facilitate this reconnaissance, as well as to assist in locating positions of the enemy, it is advisable to have an Artillery officer, under the immediate orders of the Artillery commander, march with the leading elements of the advance guard. His special duty is to look for places favorable to the action of Artillery.

On reaching such a position, the officer halts and makes a careful study of the ground. He notes its advantages and disadvantages; estimates the number of batteries which could be used with convenience; notes desirable locations for observation stations; selects and determines distances to convenient aiming points; locates any important features shown on the map; picks out the places where an enemy might probably appear; and in fact, conducts as complete a reconnaissance as time will permit, at each position as he reaches it.

Several good men should accompany him, as scouts and orderlies; by means of these men, he keeps in communication with the Artillery commander, sending back such memoranda as seem of especial importance.

Thus, when the batteries do have to come into action, the commander will find his reconnaissance well under way, and the officer, who will meet him upon the position, will be prepared to help him complete it in the shortest possible time.

If possible, positions should be occupied unseen by the enemy. Battles nowadays are likely to last several days, and take on something of the character of siege operations; so that positions may often be occupied under cover of darkness. The guns may then remain silent and concealed until the time comes for their use, when they may enjoy the advantage of acting by surprise.

Changes of position are undesirable; the guns are useless and vulnerable while in motion, and time is lost in ranging at each new position. Hence changes should not be made when it can be avoided; as will be seen later, however, some few changes during the course of the action will ordinarily be necessary.

The fire of all of the guns is under the general supervision of the Artillery commander; but the methods of carrying out his orders are left to the subordinate commanders. Fire should not be opened without his order; and no subordinate should fire upon a target other than that designated by him, unless in an emergency, or at some critical moment; in such case, the subordinate should at once report his action to his immediate superior.

As to the objective of the fire, the rule of our old Drill Regulations holds good;—"As a general rule, the fire of Artillery is directed against that arm of the enemy which at the time is predominant, or which

is capable of inflicting the greatest loss on the Infantry or Cavalry which the Artillery is supporting".

In treating tactical subjects, it is customary to consider offensive and defensive action separately. The line thus drawn is to some extent an arbitary one, for offense and defense shade into each other almost imperceptibly. But the form of battle assumed as typical,—that in which one army occupies a purely defensive position and the other attacks it,—does furnish an opportunity to discuss methods, which may afterward be modified and applied to conditions as found.

Following this custom, I will trace the course of the Artillery is such a battle, first from the standpoint of the attack, then from that of the defense.

A determined attack upon a prepared position must be preceded by a long period of reconnaissance, the attacking force gradually feeling out the position, and locating the weak points.

This is a more difficult matter now than ever before, since it must be managed from a greater distance. The defense will undoubtedly have numerous small detachments in front of its main position, some of them provided with Artillery, to mislead and delay the attack. Each detachment will have to be looked after separately, and the result will be a series of minor actions, largely fought by the Artillery,—for the detachments will not wait for their opponents to come to close quarters. The issue of each such small attack will not be doubtful; but each one must be begun with much the same caution as a general engagement, for it will never be certain beforehand just when and where the main position will be reached.

For this reason, all, or at least most, of these preliminary attacks will have to be preceded by the assembling of a formidable number of guns, all of which will be prepared to come into action at once

upon the hostile batteries as soon as located. Care must be taken not to bring them under a decisive fire, either Artillery or Infantry, or they will suffer a loss totally out of proportion to the results to be obtained. Opportunities for enfilade fire will be frequent in this kind of work, and must not be wasted.

The guns may also, in this stage, have occasion to fire upon the enemy's Infantry. The attacking Infantry will be constantly working forward, and occupying successive positions, which can, if necessary, be defended against counter attacks. If these positions be occupied or commanded by the enemy, the Artillery must aid the Infantry to get possession of them.

Finally, perhaps after days of skirmishing, the reconnaissance period will approach an end. The enemy's heavy guns will begin to be felt, and the attacker's corresponding arm will seek positions from which to reply. The fire of the opposing field guns will grow stronger, and the front covered by them broader. It will be found no longer possible to continue the tactics of flanking out or driving in separate detachments, and gradually the main defensive position will outline itself, and the weak points become apparent.

It is to be supposed that the attacker is the stronger in Artillery; this is indicated in the assumption of the offensive. Throughout the combat, it is for him to utilize this superiority by always having the preponderance at each point of contact.

So now, as in the reconnaissance period, he concentrates his guns. This does not, of course, mean that everything he has is drawn up in one grand line, but simply that the different units are so placed that each one can bring its fire effectively upon the designated target. The guns themselves may be widely separated; but they are all held in the hand of the

commander, more firmly than ever before, by means of the field telephone.

How far the physical separation of the guns may go, without impairing their tactical concentration, depends upon the terrane and upon the circumstances of each particular case. In a small force, say a single division, batteries may have to stand alone; but they should never be divided, and if it is at all possible, battalions should be kept together. In Manchuria, the favorite unit was the regiment.

The battery commander will usually have his hands full with the technical direction of the fire of his battery. The tactical application of it belongs to the higher commanders. If, then, the battery be isolated, a double duty falls upon the captain, and, in proportion as he devotes attention to one, he must neglect the other.

Nevertheless it is true, as just remarked, that concentration of guns does not mean the formation of a continuous line; it means the control, by one commander, over many units, and the careful distribution by that commander, to the units, of particular targets or fields of fire; it means unity of action.

The phase of the combat now opening is the Artillery duel. It is important for the attacker to cripple the enemy's Artillery, his long range arm, as much as possible before bringing his Infantry into action. Referring to the general rule already given for the objective of Artillery fire, we find these conditions:— it has become necessary for the Infantry to advance; at the outset, it is the Artillery of the enemy that is most dangerous to it; therefore that Artillery becomes the target for the attacking guns.

It is thus desirable for the attacker to seek a general Artillery engagement. For this purpose, he should deploy as many guns as can be used, from the outset, so as to avoid any risk of letting the defender enjoy even a temporary superiority. Enough bat-

teries to cover the enemy's whole line with an effective fire should be placed in position, ready for instant use. Each unit in this mass should have its own field of fire allotted to it, and have orders to reply to any battery which may be discovered within that field. All being ready, fire is opened upon such batteries as have been located, and an attempt is made to force the defender to disclose his whole Artillery position.

To get decisive results, a concentration of fire is necessary; and this concentration the attacker should usually be able to make. Keeping the enemy actively engaged, as just indicated, he will employ all his available remaining guns upon a single hostile unit, and silence it. The concentration will then be made upon another unit, that already silenced being left to the batteries assigned to observe that particular part of the field.

Formerly, this duel was a very distinct phase of the battle, and no Infantry ventured within range of the enemy's guns until a decided superiority was established over them. But now Artillery range is so long that Infantry must come within it, even while the duel is at its height, if it is to reap any advantage from the cannonade during its advance.

The Artillery duel, then, shades gradually into the next phase, which is the preparation of the Infantry attack.

It may, in fact, prove impossible to draw the defender into the Artillery duel. If he chooses to keep his guns silent and concealed, the attacker has no choice but to send his Infantry forward regardless of them. While this arm is seeking to gain a lodgment within striking distance of the position, the defender's Artillery will be forced to open fire upon it; his position being thus disclosed, his fire may be answered in kind.

But however this may be, when the Infantry advances to the attack a new duty imposes itself upon the Artillery. It has now to prepare the approach to the particular point selected for attack.

It must direct as severe a fire as possible upon that point. But at the same time it cannot neglect the hostile guns placed elsewhere, or the advantage gained by its previous work will be lost. The duel will have been fought at long ranges,—probably at least 3000 yards, perhaps 4000 or even 5000. The war in Manchuria furnishes instances of Artillery fighting, and very effective fighting, too, at 7000 yards. At such ranges, the possibility of putting permanently out of action the opposing batteries, concealed from view and having their personnel protected by shields, will be remote. They may be silenced, or forced to slacken their fire, but if left to themselves they would soon be able to resume it.

A division of the Artillery force thus becomes necessary. Certain batteries, including usually the heavy guns, are assigned to keep down the enemy's Artillery fire, while the remainder devote themselves to preparing the Infantry attack.

Those told off to the former duty will continue to act very much as in the duel period, except that, the opposing fire having slackened, each battery can take care of a larger sector. When the enemy perceives what is being done, he will probably intensify his fire again as much as possible, and a second contest similar to the duel will take place. For this reason, care must be taken not to draw off too many batteries, and those that remain will have to exert themselves to the utmost. Rapid volley fire will be opened instantly upon any hostile battery that renews its fire.

The positions of the batteries constituting the target will by this time be well known, and such fire can be made effective immediately. If those bat-

teries change position, their fire, when re-opened, will not be dangerous at first, so time will be available for ranging on them. It will be difficult for them to act by surprise in their new positions, for each part of the defender's line will be under close observation by some battery told off for that particular purpose, and they will be very quickly detected.

The batteries intended to prepare the Infantry assault gradually withdraw from the duel, as they can be spared, and prepare to concentrate their fire upon the point selected. All possible preparations are made for opening fire, and ranges determined as accurately as possible, so that the fire, when begun, may be effective from the first.

All then open simultaneously, and keep the defender's fire down over the whole front of the attack by a continuous fire.

It has just been said that the heavy guns will naturally be found among the batteries observing the enemy's Artillery positions. But use for them may be found at times among the preparation batteries. It will be found necessary or desirable to destroy material obstacles in the way of the attacking Infantry, and if these are serious, the greater shell power of the heavy guns will be pressed into service.

While all this is going on, the Infantry is pushing in, and making its final dispositions for the decisive attack; and when the preparations are completed the assault is launched. The duty of the Artillery now changes from preparation to support.

The support of the attack consists of two things. The first is, keeping down the fire, both Artillery and Infantry, from that part of the line against which the assault is directed; the second, guarding the flanks of the attacking force.

For the second purpose, certain batteries are designated, either from those that have been assisting in the preparation, or from those that have been

taking care of the enemy's Artillery. The flanks of an attacking force are very vulnerable, and the enemy will undoubtedly try to take advantage of this, either by counter attacks directed against them, or by fire action from favorable points outside of the threatened section.

In order to give the necessary protection, the batteries assigned to this duty act much in the manner of those which maintained the Artillery duel after the preparation of the attack had begun; that is, each battery is assigned its field of fire, and makes its preparations to act instantly and vigorously against any part of it, noting ranges to prominent places, selecting its aiming points, and keeping a vigilant watch of everything within its sector.

The guns which are told off to keep down the fire in front maintain a vigorous fire over the heads of the advancing Infantry until the latest possible moment before contact; they then slightly increase their elevation and lengthen their fuses, and sweep the ground just in rear of the enemy's firing line, preventing reinforcement or withdrawal of it.

Just when the fire should be thus diverted from the firing line is a delicate question. As fuzes, laying apparatus and observing instruments are improved, this moment may be postponed; but even so, the answer is no mere matter of calculating the danger space and ceasing the fire when the troops reach the near edge of it. The moral effect upon the Infantry has to be considered; troops can not be expected to advance with confidence very close to the real danger line. On the other hand, if the fire ceases too soon, the defenders will be able to redouble the intensity of their fire. Many infantry officers say that they prefer to take some chances of getting a few shells among them from the rear, rather than dispense prematurely with the support of the Artillery.

It has been laid down as a general rule that the fire must cease when the Infantry comes within 500 yards of the target. But if this rule be followed, the Artillery might almost as well not support the attack at all. A German officer, who observed the war in South Africa from the Boer side, holds that this distance must be reduced to 100 yards.

If, as is probable, the approach to the position is up a slope, or if the guns themselves occupy an elevated position, the fire may be safely continued longer than on level ground. And even when the guns have to increase their elevation, the howitzers, owing to the steep angle of fall of their trajectory, may continue to fire almost up to the moment of the last rush. This, it will be noted, is one of the most valuable uses of howitzers, and they should always be represented among the batteries assigned to this duty.

Some of the supporting batteries will go in with the Infantry to close range, perhaps 1000 yards or less. Several reasons will compel this. For one thing, the proper protection of the flanks may very likely prove impossible except from close range; if, for example, the enemy should be able to place a few flanking guns behind some obstacle, in such a manner that they could not be reached by frontal fire, they could cause great loss and confusion in the attacking force if no Artillery were present to reply to them.

Another reason is the desirability of affording moral support to the Infantry during the advance, through the presence of its "indispensable companion." The French, especially, attach great importance to this feature, and regard it as essential, "that the Infantry should feel the constant and immediate support of the accompanying batteries, and that these should reach the conquered position at the same time as the Infantry."

It is said that the shields now attached to the guns render it possible to serve them under fire from closer ranges than formerly, in spite of the increased power of that fire; and that consequently the batteries should not hesitate to go in, more particularly as they, together with the Infantry, will be under the powerful protection of the guns which remain behind, firing over their heads.

All this is quite true, as far as it goes, but it does not touch the real objection to this procedure of sending in the guns. The professed object is moral support; but if the guns make long stops to fire, and in so doing utilize the protection of their shields, they will soon lose touch with the Infantry. If, on the other hand, they make several changes of position, advancing step by step with the Infantry, they will, at each halt, waste at least a short time in ranging; moreover, during these movements, they will lose so many horses that they will soon be permanently stopped. In either case, the moral support vanishes.

There is something in the idea of moral support, but it ought not to be emphasized too much. Batteries must be sent in to close range, for this and other reasons, but it should be done with judgment, and after due consideration whether the conditions require it,—not as a matter of course. The guns can not remain immediately with the Infantry in any case, if they are to do any firing; and it would seem that their fire ought to have much the same moral effect upon their own Infantry, whether delivered from a position 500 or 2000 yards in rear of it. And if is a mere matter of fire effect against troops in position, a range of 3000 yards is as good as 1000—better, in fact, for the greater angle of fall of the projectiles enables them to search cover better.

Such an advance at this stage can not be made off-hand. It being decided that it should be made, the ground over which it is to pass will have to

be thoroughly, although rapidly, studied, positions and the routes to them selected, and every possible means taken for security. The number of batteries to be sent should also be considered, in view of the terrane and of the object of the movement.

In executing the advance, batteries should move successively, so as not to cause a complete cessation of fire at any time. Each part of the line should advance under the protection of the fire of some other part.

If the attack succeeds, and the enemy is driven from his position, the victor has first to occupy and hold the captured ground, and then to make the most of his advantage by a vigorous pursuit. At this time, as an English writer (Captain H. T. Russell, R. F. A.) says: "Units will be inextricably mixed, prominent officers conspicuous by their absence, and this is the time when the commander of individuality and resource, who does not shirk responsibility, can make his mark and perhaps help to make history."

The first thing to be done is to complete the enemy's rout,—prevent a counter attack, and make as difficult as possible the formation of a rear guard.

Artillery will be pushed into the position as swiftly as possible, to support the Infantry now in the act of occupying it. This is an instance where subordinate Artillery commanders, occupying advanced positions, should move without waiting for orders, and come up at once.

The batteries farther to the rear come up more deliberately, first seeing that the ones ahead have made good their foothold in the captured position, and supporting them in the event of a counter attack. Meanwhile the Cavalry and Horse Artillery are working around the flanks, and preparing to begin the pursuit.

These arms naturally take the largest share of the work of pursuit. The field batteries assist in so

far as they are able, firing upon any bodies of the enemy that seem inclined to make a stand; but without express orders they should not go far beyond the captured position; they should rather remain there until the successful Infantry has recovered from the disorder brought about by its own victory. The assistance of the guns may be needed during that process.

In the pursuit, Artillery should not waste time on small or broken bodies, but should devote its attention to the main force. It should leave the capture of prisoners to other troops; it has no men to send back with them, if taken.

If the attack is repulsed, the responsibility for covering the withdrawal and checking pursuit rests upon the Artillery, and primarily upon the batteries which are most advanced.

From the above description it will be noted that several changes of position will have to be made during the course of the action. These positions will be, in general—(1) the reconnoitering position, (2) the duel position, (3) the supporting position.

This classification of positions must not, however, be taken too literally, as a "sealed pattern" order of attack. Under some of these heads several changes of position in one action may be included; some of them may be omitted entirely, or rather one position may be made to serve for several purposes; some batteries may have occasion to occupy all these positions in succession, others will make fewer changes.

It has been remarked above that changes of position are always undesirable; and this is especially true in the attack, since changes cannot be so readily made under cover as in the defense. The difficulty increases as the range shortens, and in the later changes little or no protection can be found.

Changes should be made by echelon, part of the batteries moving under cover of the fire of the rest. If, as is usual, the old position is on the reverse slope of a hill, the best plan is to limber to the rear, first running the guns back by hand if direct fire is being used; a more or less covered line of advance to the new position may then be found, and the necessity of crossing the crest of the hill, on the sky line, avoided.

There is a tendency to consider the tactical defensive as the gainer by modern improvements in weapons. This may be so to some extent, but too much reliance should not be placed upon such a theory. To quote from Meckel:

"During a long period of peace, there is generally a tendency to forget the lessons of war; to exaggerate the results of improvements in firearms and the importance of formations; and to attribute a certain superiority to the defensive. In reality, no one form of battle is superior to another. Their relative values depend entirely upon the terrane and upon circumstances."

The battles in Manchuria would appear to support this idea. The defense has indeed grown stronger in the earlier stages of the battle, but when it comes to the decisive point, improved weapons really prove of greater value to the attacker.

The first step in battle is the establishment of contact. Each party seeks to gain information as to the force and dispositions of the other; but obviously the assailant is the more urgently in need of information. Contact can be gained only by fighting, and the defense here enjoys the great advantage of seeing without being seen, and of having his position carefully prepared beforehand. Later in the fight, these advantages gradually diminish.

The one advantage that in the nature of things always belongs to the defense is, that he can, in the

form of battle selected as typical, reconnoiter, choose, prepare and occupy his position at leisure.

The general characteristics desirable in an Artillery position have already been noted. In defense, places must be found from which the guns, without in any degree impeding the Infantry, may command all available positions and cover in front, both to protect advanced positions held by friends, and to prevent strong points being seized by the enemy. Provision must also be made for flanking fire, which may become highly important in the later stages of the Infantry attack; here care is necessary, lest the flanking positions be themselves flanked.

Every Artillery commander, of whatever grade, should carefully reconnoiter the ground assigned him. Not only the position to be immediately occupied must be examined, but several positions, having regard to the probable necessity of changing position during the engagement—for even in defense the Artillery must make some changes, although better off than the attack. When the Infantry assault begins, a new position will probably have to be taken up to meet it; and circumstances may compel other alterations in dispositions.

It would seem superfluous to say that Artillery will often have to provide for its own security, by sending scouts to reconnoiter the ground beyond its immediate position; but there is no lack of instances where this precaution has been neglected, and batteries surprised by other troops that have worked up, concealed by some apparently insignificant fold of the ground. But barring such surprise, Artillery need not fear any frontal attack. It is vulnerable in the flanks only.

Corresponding to the advantage which the defense possesses, in taking position at leisure, is the disadvantage, that he must be prepared to meet all possible attacks of the enemy. This constrains the de-

fending Artillery to scatter its force more, to cover dangerous places in the line. But the whole force must not be scattered in this way, or every part of the line will be weak. The most important points are occupied, and the remainder of the Artillery held back until needed.

Fire control is simpler in defense than in attack, owing to the greater permanence of the positions. The field telephone may be used to an even greater extent. Regular range finding systems may be established in the more important positions; a measured base line, angle measuring instruments at the ends, and telephonic communication, are the essentials of the system.

As remarked above, the first troops of the defense to engage the enemy will be small covering detachments in front. The use of these is twofold. In the first place, they force the enemy to deploy and show his strength, giving valuable information to the defender in time for him to profit by it. Secondly, they annoy him, causing him to make constant, useless and costly attacks, and gradually undermining the *morale* of his troops.

Such detachments should act in much the same manner as a rear guard; they should make a show of energetic resistance, but not allow themselves to be drawn into a serious engagement.

This being so, they should be strong in Artillery, the long range arm *par excellence*, and have only enough of the other arms to protect the Artillery; one or two batteries, a battalion of Infantry, and enough Cavalry for patrols and messengers, would be a typical make-up.

Horse Artillery accompanied by Cavalry is eminently suited for this work, but unless an army were exceptionally strong in these arms they would be of more use on the flanks. Here detachments so constituted may perform a double service; they may do

all that is outlined above, and also attempt to lead the enemy in a false direction. This is one of the few cases where dividing a battery may be good tactics. Swift and energetic, rather than powerful action is required; sharp attacks, from many points, in quick succession, may keep the enemy in doubt as to the force in his front.

All advanced parties will of course withdraw before any serious attack is developed, but skirmishers should be kept a few hundred yards ahead of the Artillery positions, so that the Artillery need not be distracted from its proper work to watch for local attacks upon its own lines.

By reason of their long range, heavy guns will be able to assist, from their main positions, in the later stages of the preliminary operations. These are usually placed near the flanks, both in order to deal with enveloping movements, and to cross their fire upon a frontal attack. They should be well dispersed, even batteries being sometimes divided. Their positions are more permanent than those of any other guns, and the telephonic communication may be more elaborated; and the high power of the guns permits their use with good effect, singly.

Unless a purely passive defense is contemplated, it is not advisable to open fire at very long range from the field guns in the main position. It is desirable to keep the enemy in doubt as to the location of the batteries until he has come to fairly close quarters. No definite rule can be given as to the proper range, in yards, to be used; but perhaps it might be said that fire ought not to be opened, if it can well be avoided, at ranges over 3500 or 4000 yards.

Each battery should have its own sector of fire assigned as soon as the advanced detachments begin to find the enemy, and should remain in observation of all targets appearing in it, until some one them comes to easy range, or until effective fire is

opened from some battery within the sector. Enough batteries should be in observation to cover thoroughly with fire all probable lines of advance of the enemy; not more, as this would result only in disclosing more than is necessary of the position. The remaining guns constitute a temporary reserve, to be held limbered, ready for use as the enemy's plans become clearer.

This does not mean that there should be any hesitation in bringing batteries into action as soon as there is any need for them, whether they be in observation or limbered up. All are gradually sent into the firing line; there is no real reserve, as that term is understood in the other arms.

Usually this process will result in a general engagement with the attacking guns,—the Artillery duel. In this, the defense, although probably the weaker, may have a very good chance of success. The method of opening fire gradually and progressively, from concealed positions, may lead the enemy to underrate the force opposed to him, and to send his batteries into action before enough have been collected. In such a case, the defense might enjoy, temporarily, an absolute superiority, and beat the attacker in detail. In any case, he has the advantage of a carefully chosen position, occupied at leisure, and should be first in getting the range. If he can handle the enemy's Artillery severely enough, the chances are that no Infantry attack will be made.

It may often be to the defender's advantage, especially if he believes himself to be greatly inferior in Artillery, to decline the duel, and save his strength for the Infantry attack. With long range guns and concealed positions, he may well succeed in holding the enemy at arm's length, never letting him get enough information about the position for a general engagement. The attacker may then, perhaps, conceal his own guns and play a waiting game,—con-

centrate upon each battery as it is discovered, and finally force the defense to open fire all along the line to avoid being cut up in detail.

If this fails, or if he has not the time for it, he will, as we have already seen, have to send in his Infantry. In the typical case, however, there would be an Artillery duel, in some form or other, and the probable result would be that the defense would ultimately have to slacken or cease fire.

Unless the defense breaks off the duel prematurely, in order to induce the enemy to make a premature assault, the Infantry will be getting under way before the duel approaches an end. The defense can not permit hostile Infantry to maneuver unmolested under his guns, and so must assign certain batteries to fire upon it; he will use as few guns as possible for this purpose, however, for the enemy's Artillery is still his most important target.

If the attack gains the upper hand in the duel, the defense must prepare to resist a determined Infantry attack. It may or may not be necessary to move the batteries to avoid further loss in the mean time; but the Artillery commanders now employ themselves in perfecting their dispositions for the next phase of the fight. Batteries are withdrawn from parts of the line where they are not likely to be needed, and a new mobile reserve formed, to be used as before.

The Artillery has hitherto been the leader in the battle. As the attack progresses, it begins to come into action again, not now as the sole, or even the predominant arm, for it has shown itself unable to prevent an assault, but solely to assist the Infantry in repelling that assault.

This being the task in hand, the advancing Infantry will be the principal target; but it is not yet time to leave the hostile Artillery entirely out of account. This is now turning a greater or less num-

ber of guns upon the point selected for the attack, and the defender should try to determine which are the batteries so directing their fire, and use some of his own guns against them.

The guns that have withdrawn from the Artillery duel ought not to reopen their fire prematurely. Their target is to be the advancing Infantry, and their object is to assist in repulsing its attack. If now they open too soon, the hostile Artillery, not being yet compelled to protect its own troops from rifle fire, will be able to return with its whole power to the guns of the defense, and crush them. Both the Artillery and Infantry of the attack can then unite upon the unsupported Infantry. There will have been two successive efforts at defense, each by only a part of the force, and each will have been overcome separately.

For these reasons, the Artillery should hold its fire until the attacking troops come to rifle range. The guns of the attack will then be forced to divide their attention between the Infantry and Artillery, while at the same time the defender's fire is doubled in intensity.

It will be a delicate matter to come into action again, and much will depend upon the care which has been bestowed upon the preliminary reconnaissance. New positions will have to be used. The old covered emplacements will not usually command the ground over which the Infantry attack is made, and the guns will have to move up, using direct fire and little or no concealment. Probably by this time the old emplacements will have been closely located by enemy, so that the advantage of retaining them is minimized.

Besides, by coming into action in a new position, the element of surprise is introduced. A cannonade from an unsuspected quarter, especially if a cross fire

can be brought to bear, should have a stopping power entirely disproportionate to its volume.

As the direction of the attack becomes clearer, more and more guns should open, until, by the time it has fully developed, all are in action. And, as the decisive moment approaches, every gun should fire upon the Infantry alone, neglecting the hostile guns.

Each gun is, as the phrase goes, "its own reserve." That is to say, its maximum rate of fire is seldom used, and a battery can at almost any time double its rapidity. But at the crisis of the attack, this reserve, with all others, is thrown in.

If the attack is repulsed, the defender will usually try to take the offensive in his turn, and the guns will act as already indicated for pursuit.

If the attack is successful, a counter attack will be attempted. In this, the Artillery has, first, to hold in check the hostile batteries and prevent their advancing to the position; and, secondly, to turn such guns as it may upon the penetrating Infantry. The enemy will probably press his Infantry strongly into the breach, and if, at the proper moment, a rapid Artillery fire at short range be poured into the flank of this mass of troops, the effect will be destructive in the extreme.

When the enemy's success bids fair to be more than a local one, the commander-in-chief will try to withdraw some of his guns in time to establish a rallying point in rear. Such as are not ordered back cover the withdrawal, and continue to make an unshaken stand. A withdrawal will be a difficult matter after the Infantry assault is well advanced, and can be successfully made only if the ground is favorable. As for the guns that remain behind, it may be possible to save them, or a part of them, if a temporary success can be gained; if they are lost, the loss under such circumstances is to the credit of the personnel. The old Drill Regulations say, "the loss

of well-served guns in the defense of a position, or in close support of the other arms, is honorable".

In covering a retreat, the duties of Artillery are obvious. Its most dangerous enemy is Artillery, or, especially Horse Artillery accompanied by Cavalry. Its mission is to gain time, so that order may be restored and a rear guard formed. This it will naturally do by falling back slowly from position to position, moving by echelon, and holding the enemy by its fire whenever possible.

A few words concerning Artillery on the march may well be added here.

Two considerations determine the position of Artillery in an advancing column. It must be near enough the head to be quickly available when needed, but not near enough to risk being caught in column of route by hostile Artillery fire.

These requirements evidently need careful balancing. Under present conditions, Artillery caught in column of route within 4000 yards of a hostile battery would be very roughly handled. The Infantry, then, must provide the Artillery with a sufficient maneuvering zone to avoid this risk, and a part of the guns should march as near the head of the main body as is consistent with this requirement.

As a long column of guns would be very vulnerable in flank, it should be broken by bodies of Infantry placed between units. Many guns will thus be left far from the front, and the Artillery must overcome this disadvantage by being prepared to cover considerable distances at a rapid gait. Every effort should be made to clear the roads for it when it is needed at the front; the Germans provide for this by having a special bugle call, "Bear to the right (or left)", included in the drill regulations of all arms. But Artillery commanders in rear may themselves push ahead when they expect to be needed, without waiting for orders, going across country if the roads

are not cleared for them. This must of course be done with judgment, but on many occasions great results have been obtained through timely pushing ahead by enterprising Artillery commanders.

This all applies, of course, to large units of Artillery, marching with the main body. In a force of some size, however, say a brigade or more, a small amount of Artillery can be moved up into the reserve of the advance guard without undue risk. Its action there depends upon the object in view.

Some writers favor its being dispersed widely, covering as broad a front as possible, with the idea of deceiving the enemy as to the force and intentions of the command. Others prefer that it be kept well in hand, in order to facilitate control over it, and also to allow reinforcing batteries to come into line with it without mixing tactical units.

If it be necessary to brush aside a weak opposing force, the advance guard Artillery will go in as close as possible before opening fire; the advance guard commander should be pretty certain of his ground before ordering this, however. If the object be simply delay, the Artillery opens at longer ranges, firing slowly and holding back the leading elements of the enemy.

If there is any chance of a general action following, the advance guard Artillery takes care so to select its positions as to facilitate the deployment of the guns of the main body.

In a retrograde movement, the Artillery of the rear guard has a difficult task, in that it must remain in position long enough to let the main body get on, but not long enough to become seriously entangled itself. In general, the rear guard will be stronger in Artillery than an advance guard of the same size; and the guns can act only by retiring in echelon from one position to another. Occasionly they might get an opportunity for a brilliant success by waiting in a

concealed position well out on a flank; but such an undertaking is risky, and could not often be attempted.

The guns of the main body are widely separated from those of the rear guard, pushing on for positions in rear. If the commander still hopes to make a stand, he must get his guns in position somewhere as soon as possible, and rally his Infantry under their protection; if he is not in a position to risk a fight, he has nothing for them to do, and will get them out of the way as fast as possible, clearing the roads for the rest of his force.

In a flank guard, mobility is the great essential. The guns form in two groups, and, if a fight is forced, take successive positions facing to the flank; the group in rear limbers up at the proper moment and passes the other. This is a dangerous proceeding, and the route to be followed requires some consideration.

Guns would be assigned to an outpost only in a large force. They usually remain with the reserve, but in special cases go farther forward. Such cases might occur if the outpost were one thrown forward to hold ground on which it was intended to fight a general action; or if a defile, through which any attack must come, were within range; or if favorable positions for the enemy's guns were observed beyond rifle range of the line.

Outpost duty is extremely wearing on Artillery, since the horses must remain in harness; this causes rapid deterioration, which no amount of care can prevent.

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