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Artillery in Defense

Course In Organization and Tactics.

Lecture No. 15,

BY CAPTAIN O. L. SPAULDING,
Artillery Corps.

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**Department Military Art,
Infantry & Cavalry School.**

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The purpose and scope of this paper are very strictly limited. The argument, briefly, is this: we have a standard text-book, of unimpeachable value and authority, now some ten years old; what modifications have become necessary in that part of this book which discusses the present subject, by reason of recent developments in materiel and methods?

At first sight, it may also seem that the book must be made over. We have heard, of late, two separate lines of argument, both going to show that the old principles of artillery tactics were out of date— that everything must be radically changed— revolutionized. One school argues from theory, usually with the new French field gun as a text; the other from experience, citing the lessons of the Anglo-Boer war, but both demand radical changes in principles, not merely in details.

Both are right to a certain extent. The deductions drawn from the Boer war, however, are of but slight value to the artillerist, on account of the very special and peculiar circumstances of the fighting. Many illustrations of particular points may be found in the history of this war, but it is absolutely unsafe to generalize from this experience alone,

The French school, so to call it, perhaps comes nearer to the truth. The French have gone more deeply than anyone else into the subject of the employment of the newest materiel? and their results are valuable to all but it is to be feared that they have allowed themselves to be carried away by their

own success, and have gone too far in their theorizing. This is natural for any writer on military subjects in time of peace, especially if he be an enthusiast upon his subject.

But to me it seems that the principles laid down by our standard authority have stood remarkably well the test of great changes in armament. We should, therefore, have greater confidence than ever in the old system: -modify the details as much as need be, but hold fast to the principles.

It will not be necessary here to go into particulars about the new materiel as compared with the old. The general nature of the improvements is fairly well known, and some of the points have already been covered by a former paper in this series.

The line drawn between the offensive and the defensive is perhaps to some extent an arbitrary one, for the two shade into one another almost imperceptibly. The form of battle assumed as typical—that in which one army occupies a purely defensive position and the other attacks it—does, however, furnish an opportunity to discuss methods which may afterwards be modified and applied to conditions as found.

A tendency is observed to consider the tactical defensive as vastly strengthened by modern improved arms. This tendency was especially noticeable at the time of the Boer war, when current events in South Africa were hailed by numerous writers as confirming their theoretic deductions. Perhaps this may be checked by fuller reports from the seat of the present war in the east. 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 terrain and upon circumstances."

The fact appears to be, that 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 assailant.

The first step in battle is, of course, the establishment of contact. Each party seeks to gain information as to the force and dispositions of the other; but obviously the assailant is more urgently in need of information than his adversary. And clearly his gaining of contact is more difficult now than ever before, since it is impossible to approach near enough to see distinctly. The powerful artillery of the defense, already in position, using smokeless powder, and able to act with effect at long range, can bring to bear upon advancing troops a sufficient fire for this purpose without seriously exposing its own position or hampering its own freedom of action.

Contact can be gained only by fighting, and the defense here enjoys the great advantages of seeing without being seen, and of having his positions carefully prepared beforehand. Later in the fight these advantages gradually diminish.

One advantage, however, must always be on the side of the defense, regardless of the question of arms. He can, in the ease selected as typical, choose, prepare, reconnoiter and occupy his position at leisure. Even this advantage is more or less offset by corresponding disadvantages, as will be noted later.

The general characteristics of the position to be sought by artillery are the same in all cases, offensive or defensive. The requirements are familiar, and need not be gone into in detail. As these ideal positions will never be found, however, some points,

should be given special weight by the attack, some by the defense.

It goes without saying that the artillery position must be chosen with reference to the Infantry, which must not be in any degree impeded by it.

The defender particularly seeks a clear range, both on front and flanks. His guns must 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. Flanks, always weak points, are especially so in the case of a defensive fight. Cover for the guns is of the highest importance, for to expose a line of guns to view is to give the enemy exactly the information he wants as to the position. Guns may be withdrawn from the crest of the position, far enough down the reverse slope to make the target just visible through the sights. In some cases it may seem advisable to withdraw them even more, dispense with actual view of the target and have recourse to indirect laying. Some form of gun-pit or mask may be used, but it should not be forgotten that placing a gun in a sunken gun-pit lowers the line of sight and contracts the field of fire. The position should by all means be examined from the enemy's side, when unsuspected defects may be discovered. The nature of the background influences visibility greatly, and a gun-pit that is recognizable as such is worse than none at all.

As a matter of course, each artillery commander, from the chief down, should carefully reconnoiter the ground assigned him. Not only the position to be occupied immediately 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 attack begins, a new position will probably

have to be taken up to meet it, and changing tactical situations will compel changed dispositions.

Provisions should be made for flanking fire, which may become a very important matter in the latter stages of the infantry attack, here care is necessary lest the flanking position be itself flanked.

It would seem superfluous to say that artillery must send scouts to reconnoiter beyond its immediate position, to provide for the security of the batteries, but this elementary precaution has more than once been neglected, when neglect cost dear. At Koenig-gratz two Austrian batteries, sixteen guns, had failed to watch a fold of the ground in front, which proved sufficient cover to enable the Prussian infantry to surprise them completely and capture all but two of the guns. On another occasion, twenty Austrian guns, in position on a hill, were charged both in front and flank by Prussian cavalry, which had worked up unseen, and nearly the whole battery was taken.

Barring such surprise, artillery need not usually fear any frontal attack, made on a front not greatly broader than its own. The chief danger is in a flank attack.

Corresponding to the advantage which the defense has, in taking up position at leisure, is the disadvantage, that he must provide for all possible attacks of the enemy. This constrains the defending artillery to scatter its force more, to cover dangerous points in the line. But it would not do to scatter the whole force in this way, or every part of the line would be weak. The most important points are occupied, and the remainder of the artillery held back until needed. In occupying position, guns are unlimbered under cover and run forward by hand, the horses being kept out of danger. Ammunition should be placed in readiness near the guns, but not until the firing position has been definitely occupied, or a

change of position might be rendered difficult. The handling of ammunition is, however, much simplified now, with the introduction of fixed ammunition.

In apportioning the position among the batteries, care should be taken not to break up tactical units. In the case of a division acting alone, the battery must usually be the unit, in a large force, battalions should be kept intact as far as possible. But the mere fact that the batteries are at some little distance from each other does not necessarily mean that they are not "concentrated", tactically. Long range guns can act in concert even if not side by side, and the greater permanency of position of the batteries of the defense enables one commander to keep control over more or less widely separated groups. In this connection it is interesting to note the reports of the extensive use by the Japanese of the field telephone in connecting batteries. Some reports go so far as to say that actual range finding systems are laid out in their more important positions, with a measured base line, angle measuring instruments at the ends, and telephonic communication.

As already mentioned, the establishment of contact is the first task of the assailant. Heavy guns, which will hereafter form a necessary part of an army's artillery, will compel his deployment at a distance and render this a difficult matter. Another means of baffling the enemy will be found in the use of covering detachments. These are nothing new, having been employed before with great success; notably by the Prussians in 1870, and more recently by the Boers. But, according to many writers, they are likely to be used more than ever in future.

The use of these detachments 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 may, — in the language of Derrecagaix, — “compel the enemy to make constant, successive attacks, and to undergo, each time, losses which will gradually injure the morale of his troops.

The general conduct of such detachments must be on the lines of that of a rear guard, they must offer an energetic resistance, but not allow themselves to be drawn into a serious engagement.

This being the case, they should be strong in artillery, which is the arm *par excellence* for long range work, and should have only sufficient of the other arms to protect the artillery, one or two batteries, with a battalion of infantry and enough cavalry for patrols and messengers, would be a typical make up for a detachment in front.

Horse artillery accompanied by cavalry is especially suited for this work, but unless an army were very strong in these arms they would probably be of greater service on the flanks. Here, detachments so constituted can perform a double service, they may do all the duty already outlined for a covering detachment in front, and also may attempt to lead the enemy in a false direction. Here, it will be seen, is found one of the few occasions when dividing a battery may be good tactics. Swift and vigorous action are required, but not necessarily great power; sharp attacks must be made, from many points, in quick succession, with the hope of keeping the enemy in doubt as to the force in front of him.

These detachments, as well as any other advanced parties, will of course have been withdrawn before any serious attack is developed, but skirmishers should be kept a few hundred yards ahead of the artillery position so that the artillery need not be distracted from its proper work by the necessity of watching the local attacks upon its own lines.

The range at which it is useful to open artillery

fire from the main position has been and still is a mooted question. One idea is, that modern guns being capable of effective fire at great distance, it is a foolish throwing away of an advantage not to use it; the other idea is to consider long range fire as a resource to be used in exceptional cases only, not as a regular thing.

Much may be said in favor of the first method. We now have powerful telescopes, which render it possible to observe long range fire clearly and accurately, and modern methods of indirect and progressive fire render firing more or less independent of the vision of the gunner? smokeless powder, too, has its effect, altogether, fire at 5000 or 6000 yards may be 'made more effective than fire at 3000 yards a few years ago.

But, on the whole, the artillery may well adopt for its general guide Marshal Bugeaud's dictum for infantry, — "Long range firing is an indication of poor infantry; good troops hold their fire."

For one thing, ammunition supply is 'limited, and if fire is opened at long range a battery may be reduced to silence before the time for its really decisive use arrives. This consideration has less weight for the defender of a regular position than for his adversary, but it exists, and should not be overlooked. Another important point is that the defense does not care to reveal its position and strength by opening fire until it can inflict really important losses.

As usual, neither extreme view is absolutely correct. While the general principle just stated should be the guide, certain special cases, already touched upon, should be again mentioned here.

The artillery of covering detachments must necessarily use the longer ranges, owing to the necessity of breaking off the fight; and the heavy guns may perform much the same service from their main posi-

tion by opening at extreme ranges, Neither of these special cases, it will be noted, is an actual exception.

In this connection the matter of heavy guns deserves notice. Such guns are clearly destined to play a large part in future field, as distinguished from siege operations, The Boers used them even up to six inch caliber; and the present war in the East is furnishing illustrations of their use, They are very valuable, as just noted, in forcing an early deployment; and can also be used to great advantage in dealing with flanking movements by the enemy, They have, of course, less mobility than the lighter guns, and hence their original position should be carefully chosen with reference to these and other similar considerations.

As for the actual range, in yards, at which fire from the regular field guns should be opened, no rule can be laid down, The thing of real importance is, that the guns be placed on the firing line before the enemy's artillery has come into action, so that he may be compelled to take position under our fire, not we under his, It might be said, however, that it is not desirable, unless compelled by the terrain or the movements of the enemy, to open at ranges greater than 3,500 or at most 4,000 yards.

When fire is actually opened, its intensity should be carefully regulated: enough batteries must come into action to cover the target with an effective fire, but no more.

To this plan some exception will perhaps be taken, It is sometimes suggested that, even if one battery can and does effectively cover a given objective, two could certainly do the work better, or at least more quickly.

But suppose all the guns come into action at the very outset. The immediate objective may be overwhelmed quickly, but what more will happen?

The artillery will have disclosed its whole position. New hostile batteries are coming up, and there is no one watching for them-everyone's attention is engaged with the first target. The fresh batteries come into action unmolested, and open fire upon a distinct target; to deal with them, guns already in action must change objective, -a troublesome operation, costing time. Further, although now, with long range guns, artillery need no longer, as formerly, be regarded as "expended" when it has once been sent into action; still it is not immediately available for a special effort which may be required at some particular point.

A large force being displayed, the enemy becomes cautious, and brings his troops into action only when he has enough collected to insure decided superiority. The defense has lost the advantage gained by its earlier deployment, and has missed its chance to surprise the enemy.

So, then, the guns must come into action only as needed; those remaining perform two more or less distinct functions. One part remains in observation, ready to come into action against new targets coming into the field of fire allotted to it; the other part constitutes a temporary reserve, capable of being used in mass at any point where it may be needed. All these batteries are gradually fed into the firing line; there is no permanent reserve.

The enemy may, perhaps, be induced by this means to send his troops into action as they arrive, and get them up in detail.

This does not mean that the guns should delay in opening fire when they are needed. As a late book says, "Today, more than ever, the victory will belong to him who first completes the deployment of his artillery, and who, at the same time, has correctly judged the amount necessary to use in the first instance."

Neither does it mean that the idea of massing guns is obsolete. The very principle of holding back a part of the guns is to be able to concentrate later upon decisive points, when these points are determined. Properly understood, massing does not necessarily mean drawing up a long, continuous line of guns and concentrating their fire upon a single objective; 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 against different objects.

As to the objective of the fire, our present drill regulations say that "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. ' '

Following this rule, the artillery of the attack will usually be engaged, the action commencing in the manner just outlined-. And the duel thus begun must be carried on with the utmost energy and determination; every gun must be brought to bear. As already remarked, there is no permanent reserve, half way measures are always bad in battle; and especially so in this case. The defender's artillery is probably inferior in strength to the assailant's; superiority is generally implied in the assumption of the offensive; but if the defense has skillfully availed himself of every advantage, he may still engage in the duel with good hopes of success. If the assailant has been induced to bring his batteries into action a few at a time, the defense may actually have the absolute superiority: He has, at least, the advantage of a carefully chosen position, occupied at leisure, and should be first in getting the range. To quote the drill regulations again, "if the artillery of the defense can gain and keep the superiority, the possibilities

are against the success of an infantry attack, and therefor the artillery duel should not be declined unless the artillery of the defense is relatively very weak, or the ground is such as to compel the enemy to deploy at a great distance."

But if the defender sees fit to decline the duel, he is now better able to do so than ever before. Formerly, with guns of shorter range, the assailant could take a closer position for the duel, from which he could locate the defender's guns; especially as the importance of cover has been less emphasized until recently, short range guns being more restricted in their choice of position, and hence being less able to take advantage of it,

This facility of declining the duel was very noticeable in the Boer war. Artillery duels did take place, especially when the ground was open enough to give the English, who were usually the assailants, a clear target. 'These duels resulted in favor of the English, on account of their great numerical superiority in guns; or else were prematurely broken off by them, on finding that the Boer guns outclassed them in range.

But when the Boers did not wish to engage in the artillery duel, the terrain was usually such as to permit them to decline. Their guns were placed in concealment, widely dispersed, and fired slowly and irregularly. Smokeless powder rendered it very difficult for the English to locate even one of them. As soon as one was located and fire opened upon it, it ceased firing and moved to another position, already prepared beforehand. They never courted destruction by engaging an overwhelmingly superior enemy, but saved their strength to oppose the infantry attack,

Of course, the nature of the terrain - was one of the chief factors in the success of these tactics. On less favorable ground; the attack might itself seek

cover and concentrate upon each gun as it was discovered. The defense might find no other resource than to open fire all along the line, to avoid being cut up in detail. The regulation artillery duel would then ensue, and could only result in the silencing of the defenders weak artillery.

In the general case it may be said, there will be an artillery duel, in some form or other. But if the attack is skillfully managed, it will not be a separate phase of the battle, clearly marked off from other phases, but will gradually shade into the infantry action. In South Africa, it is true, there were plenty of cases where there was a sharply defined line between the artillery and the infantry actions, The English would bombard a Boer position for hours, finally silencing the Boer artillery, if the duel was accepted, then cease firing, and begin the infantry attack. But the warm reception given these attacks would not encourage one to copy such tactics.

Unless the defense breaksoff the duel prematurely, in order to induce the enemy to make a premature assault, the infantry attack must be commenced even while the duel is at its fiercest, That is, the infantry must come within the range of the guns and attempt by utilizing the cover afforded by the terrain, to work closer to the position, A closer reconnaissance is absolutely necessary before the final assault is delivered, and, if the artillery forces are somewhere near equal, the attacking infantry must gain a footing upon some defensive positions ahead of its own guns, which it may use in checking any counter attack in case of defeat in the duel, or from which it may make its own attack, The defender cannot well allow these movements to be made unmolested, and will be forced to turn a part of his guns upon these troops whenever they expose themselves; he will use as few guns as possible for this purpose, however.

for the enemy's guns are still the most important target, and if they establish superiority over him, he may have to cease firing altogether, with a part or the whole of his guns,

If this becomes necessary, the silenced guns may have to be withdrawn from the position, to avoid unnecessary exposure and to save them for a later stage of the fight. But it is sufficient simply to withdraw them a short distance behind the crest—just far enough to insure shelter and allow freedom of movement. And it may be possible, at least for a part of the guns, to remain where they are, the men simply taking shelter, by lying down or otherwise. The artillery commanders in any case, should remain where they can watch the progress of the battle, and be prepared to take advantage of any opportunity, or to respond to the call of any emergency.

The artillery force which has been all sent into action, little by little, is now again subdivided for what is really a new fight—the defense against the decisive infantry assault. One part remains on or near its position, ready to aid the infantry to repel the assault, continuing such fire as it may be able to do with advantage: the other part again becomes a sort of temporary reserve, a weapon in the hand of the commander-in-chief, to be used whenever and wherever the necessity arises. It is now the last resource, and must be used energetically, unexpectedly and at the proper moment, if defeat is to be averted.

As the attack progresses, the guns—which have ceased firing begin to come into action again, not now as the sole or even the predominant arm, for they have shown themselves unable to prevent an assault from being attempted; but purely and exclusively to support the action of its own infantry in repelling the assault. To allow itself to be diverted

from this duty will be ruinous; the defending infantry left to deal unaided with both the infantry and artillery of the attack, will be overwhelmed:

With this task to perform, the chief target will be the advancing infantry. But it is still too early in the battle to leave the hostile artillery entirely out of account. This is now turning a greater or less number of its guns upon the point selected for attack, and the defender should try to determine which are the batteries so directing their fire, in order to use some of his own guns against them. If some of the batteries are considerably nearer the position than the others, especially if they have just moved in to the shorter range, these will be the ones to fire upon: they are intended to prepare the attack, for they did not need to come forward in order to fire upon our guns. These batteries, with the attacking infantry, constitute at this time the forces capable of inflicting the greatest loss upon our infantry, and consequently, by the general rule of the drill regulations, the batteries *that have not yet turned their fire from our artillery positions must be disregarded. Besides this, the batteries which have come up to prepare and support the attack are an easier target, and our guns stand a better chance of silencing them. If this can be accomplished, others must come up to support them, weakening the rear line of guns more effectively than the fire of our inferior artillery could possibly do.

The proper function of the guns being thus definitely determined, the next question is, when shall fire be opened upon the new objective, by those guns which have temporarily withdrawn? As a rule, it might be done at any moment, for even before the defense was forced to concede the superiority of the attacking artillery, it had already devoted some attention to the infantry. And this fire could be made

immediately effective, too, so great is the power of the guns. The temptation to open early will certainly be strong; it will be hard, indeed, for artillery to stand ready to come into action and still not open upon a clear target within easy range. But if it yields to the temptation, and opens too soon, what will be the result? The hostile artillery, not being as 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 made by only a part of the force, and each will have been overcome separately.

For these reasons, the artillery must hold its fire until the attacking force reaches the outer limit of the zone of effective rifle fire—say 1500 or 1600 yards from the infantry position. In this way the guns of the attack will be forced to divide their attention between the point of attack and the batteries on the line, while at the same time the fire upon the advancing infantry is doubled in intensity.

This, coming into action the second time is a matter of no little difficulty, and the success of the movement depends chiefly upon the care which has been devoted to preliminary reconnaissance of possible positions. The old emplacements should not be occupied again, for several reasons, but new ones should be used. In the first place, the chances are that the position chosen with reference to the requirements of the artillery duel will be found not to command the ground over which the infantry attack is made, for that position is probably on the reverse slope, the line of sight to the distant target just clearing the crest. In the second place, it would be undesirable to reopen fire from the original position

in any ease, even if it fulfilled the requirement of commanding the ground; the enemy knows where the position is, is watching it closely, and already has the range.

Finally, by coming into action in a new position, the element of surprise is introduced. A cannonade from an unexpected quarter, especially if it has been possible to select the position so as to secure a flank or cross fire, will have a stopping power entirely disproportionate to its volume.

The advantage of cover, however, will probably have to be foregone. The necessity for a maximum fire affect from each battery that comes into action now far outweighs any other consideration. As has already been said, the artillery now begins to assume the character of a last resort; if it can not check or weaken the attack, the defending infantry, itself under artillery fire, will be unable to repel it,

It is not necessary, or even desirable, however, that all the guns come into action at once. As has been noted above, a temporary reserve has been formed for the second time, and has not yet been used against the infantry attack. The reason for this is, that the direction of the attack cannot at first be definitely determined, and, if the artillery is all deployed and in action, it will be too much dispersed to be concentrated promptly upon the decisive point.

These guns, then, are held back, and are not to be used until the attack is fully developed. But there should be no hesitation nor delay in using them as soon as the decisive stage is reached. Every gun must come up; and in the absence of orders from higher authority, the artillery commanders themselves should order fire to be opened. As the range is now short, and the attacking infantry closely engaged, the effect of surprise will be very great. A few guns may turn the scale at this stage, if they suddenly

appear at an unexpected point, particularly if on a flank. This effect is intensified by the rapidity of fire possible from modern guns? for if it is produced at all it has to be done in a very few minutes,;

It is hardly necessary to say that now the *fire* should be directed against the infantry alone, regardless of the hostile guns. The time available is short, and powerful concentration is the only chance.

If resistance is continued to this stage, the only hope of safety for the artillery is in crushing the attack. In case of defeat, it may succeed in covering the withdrawal of the infantry, but a considerable proportion of the guns must be lost. The horses would certainly be killed if an attempt were made to limber up, and then the guns would fall an easy prey. They must fight to the last, and without any thought of the loss of the guns.

If the assault is repulsed, the defender will probably attempt to assume the offensive in his turn, and the details of such an action falls without the scope of this paper. In a general way, the artillery will turn its fire upon any body of the enemy that seems inclined to stand, while the cavalry, with the horse artillery, pushes to the front wherever possible, and, as Kipling puts it, "gently stimulates the break-up".

If, on the other hand, the attack is successful, and the position is penetrated, the defense has the difficult task of expelling the enemy by a counter attack. 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 and to assist in the counter attack. The enemy will naturally press his infantry strongly into this breach, and if a rapid artillery fire at close range can be poured into the

flank of this mass of troops, its 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 probably try to withdraw some of his guns in time to establish a rallying point in rear. Such as have not been ordered back cover the withdrawal, and continue to make an unshaken stand. A withdrawal will be a most difficult matter after the infantry assault is well developed, and can be successfully made only if the ground is favorable. The German artillery drill regulations say that it is impossible to limber up within 400 meters of the attacking infantry; an estimate which seems highly optimistic. As for the guns that remain, it may be possible to save them, or a part of them, if a temporary success can be attained; if they are lost, the loss under such circumstances is to the highest credit of the personnel. The 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. Such guns as have been successfully withdrawn from the defensive position need have little fear of the enemy's infantry, which can hardly push the pursuit closely so far. As noted above, the dangerous arm is the artillery, or, more particularly, a mixed force of cavalry and horse artillery. The mission of the artillery of the defeated army is to gain time, so that order may be restored and a rear guard established. This it will naturally do, by falling back from position to position, moving by echelons, and holding the enemy by its fire wherever possible,

OLIVER L. SPAULDING,
Captain Artillery Corps,

December 14th, 1904.

QUESTION SHEET

Lecture No. 15.

1. What points deserve special attention in selecting and reconnoitering a defensive position for artillery?

2. In a general way, how will the artillery be distributed along the position, preparatory to occupying it, and how will the actual occupation be made?

3. To what extent is distribution of guns permissible in defense?

4. What will usually be the first use of guns in defense, and in what manner will the forces concerned be handled?

5. What can you say as to the range at which fire from the main position should be opened?

6. What considerations govern the intensity of the fire at the outset?

7. What division is made of the guns which are not at first placed in position?

8. What is the general rule concerning the objective of artillery fire?

9. Under what circumstances should the defense decline the artillery duel?

10. Will the guns of the defense ever have occasion, during the duel, to fire on targets other than the hostile artillery? Under what circumstances?

11. If the defense is unsuccessful in the artillery duel, what changes of position and what new dispositions must be made?

12. What part does the artillery play in resisting the infantry attack?

13. Up on what targets will it fire?

14. At about what range will the guns which have ceased firing begin to come into action against the infantry attack?

15. What considerations determine this range?

16. What considerations determine the question, whether or not the guns shall reoccupy their old emplacements?

17. Why should not all the guns come into action simultaneously: and at what time should the last reserve be sent in?

18. Upon what target will the guns now fire?

19. What will be the action of artillery in case the position is penetrated?

20. How will it be handled if a withdrawal from the position becomes necessary?

21. How, in covering a retreat?

"Whatever arguments may be drawn from particular examples, superficially viewed, a thorough examination of the subject will evince that the art of war is both comprehensive and complicated; that it demands much previous study, and that the possession of it 'n its most approved and perfect state is always a great moment to the security of a nation."

WASHINGTON'S LAST ANNUAL MESSAGE.