

ability to manoeuvre, an indispensable qualification to command. Artillery is the most difficult arm to manoeuvre, but a commanding officer should be able to clear his guns, get into the proper place and get the proper direction in quarter column at a trot, and then form line to the front and gallop his line into action."

In choosing a position the following points should be observed:

1. Take up the best position to give full effect to the fire of your batteries.
2. So draw up your position that it will be difficult for the enemy to range upon you.
3. And so arrange your guns that, while obtaining the full effect of their fire on the enemy, they are themselves as far as it is practicable concealed from view of the enemy.

As to the first qualification—See that there is a clear view of the target over the sights. See that there is sufficient space for your whole line of guns, in other words, so as to be able to concentrate your fire. See that your ground is as level as possible to check excessive recoil, also that the line of front is unbroken by obstacles, and also that the ground in front is open and free from cover for the enemy.

As to the second qualification in selecting your position, to prevent the enemy ranging upon you try and secure ground where the background is unfavorable to observation of fire by the enemy; also guard against the proximity of any prominent objects that the enemy could range on. Wet or broken ground in front of your line of fire is advantageous, as being likely to hold the enemy's shell; but it must also be born in mind that wet or boggy ground will be disadvantageous if it impedes movement.

As to the third qualification—concealment of view from the enemy, use may be made of natural cover, or artificial cover may be thrown up. It may be well here to mention that in selecting positions for ammunition wagons, the service of ammunition is par amount.

The foregoing choice of positions is laid down for artillery of the offensive. For the defence they vary somewhat. The requirements of a good position for defensive actions are that its length and depth should be suitable to the number available for holding it. Second, the flanks should be able to be easily defended. Third, there should be a commanding view and fire of the country over which the enemy has to pass. It should also afford good positions for gun and cover for reserve, and, above all, the communications throughout should be easy and ample facility afforded to advance or retreat.

Mistakes will constantly occur in bringing up all the guns of the artillery corps into position, or as many as may be required, and miscalculations as to the available space may happen. All such errors should as far as practicable be corrected while in the preliminary position. When changes have to be made in order to correct these errors, care must be taken to expose the units in motion to as little of the enemy's fire as possible, and to do this the batteries ordered to change their position should limber up and move to the rear, utilising all cover available before it advances to its correct position.

The rules as to fire discipline are practically the same for all armies, and can only be obtained by careful instruction, and the instruction should be concise in laying down choice of projectile, and should exclude all error and misconceptions in target, aim and range and order of fire. The officer commanding a brigade division of artillery will be responsible for its tactical conduct and concentration or distribution of its fire. If he is convinced that a battery is not obtaining full possible return, hence the above reference to insensibility he will order the alteration of elevability on the part of the artillerymen to determining which particular battery, of a number firing, has made a particular shot,

it is advisable generally to appoint one battery to find the range, and the other batteries in the brigade may in the meantime be ranging distant objects in the vicinity that it may possibly be of use to have. The rate of fire will generally be determined upon by the officer commanding the artillery. The ranging of individual batteries and the conduct of their fire will be left entirely in the hands of officers commanding batteries. The choice of projectile also will generally be left to battery commanders.

As a general rule the fire in the preliminary combat, such as artillery would be engaged in, or during the artillery duel, will be slow fire. To fire rapidly during a whole action would be impossible, as the ammunition would not last, but a great moral effect can be produced by rapid fire or a salvo when it is timely. Rapid fire can best be employed when masses of the enemy are moving within effective range, when artillery is in movement or coming into action, when the decisive infantry attack is about to take place, when guns have to act in self-defence at short ranges, and when one echelon of guns has to move forward under cover of those still in action. It would appear a mistake to concentrate the fire of any group of guns on any special mark. In the first instance, the enemy should be cannonaded along his whole line of guns.

The following may be estimated as the comparative effect of fire for artillery and infantry, viz.: Distant to medium range for artillery is from 3,500 to 2,500 yards; medium artillery to long range infantry from 2,500 to 1,500 yards, and decisive artillery to decisive infantry 1,500 to 500 yards.

Advantage should of course be taken of the utmost range of guns to annoy troops passing over a bridge or an obligatory point of passage as far as the eye can reach. At 1,100 yards artillery can defend itself against infantry, but it would be dangerous to allow them to approach within 800 yards, as the guns run the chance of being silenced. Artillery which has found its range should make it very difficult for hostile artillery to come into action up to 2,500 yards.

It is pretty generally acknowledged that the massing of guns and the tremendous effects obtained thereby was the result of the manner in which the general actions commenced, rather than any pre-conceived tactical ideas in the war of 1870. The concentration of fire of a large group of batteries, together with the effect of strict fire discipline, has never yet been seen, as fire discipline in field artillery, in its thorough acceptance of the word, is more or less of recent date. Moreover, the field guns of to-day are far more powerful than they were in 1870 (except the guns in the Canadian service) and the destructive effects of the modern shrapnel have yet to be witnessed. Brackenbury says:

"If it is to be considered that the present artillery material has never yet been fairly tried in warfare, and that every year increases in some manner its efficiency, that the modern theory of artillery tactics or the mode of using the prefected equipment is of comparatively recent growth, and that the other arms are, from the very nature of their constituents, incapable of much more progress, it may be fairly deduced that the power of the artillery arm will, in the future, be even greater than it has been in the past."

When the general commanding considers that the enemy's guns are sufficiently subdued to admit of his infantry advancing, he makes known his views to the officers commanding the artillery and points out the enemy's position on which he proposes to concentrate his attack. The fire of all the batteries, except one battery, is now converged upon the point of attack, and some little time is generally allowed for this concentrated fire to take effect. The remaining battery, which has not changed its original range of fire, should

now be directed to sweep the whole line of the enemy's guns, and thus prevent them from making a new formation to meet the forthcoming attack.

As soon as the general advance of the infantry is ordered, the whole of the guns will turn their fire on the enemy's infantry and neglect for the time the artillery. Support to the infantry in advance must be afforded by the guns. The guns should advance with the infantry if the ground will permit of it, up to the point where the enemy's fire becomes so deadly that it is impossible to bring them into action. The advance of the artillery always has a great moral effect. A bold advance of artillery dispirits the enemy. The noise of the discharge, and the violent explosion of the shells, combine to cause an effect on the nerves of the soldier, wholly incommensurate with the actual destruction caused. In fact, the limit to which the guns may advance in an attack must depend a great deal on individual circumstances of the particular engagement in which they are in. No doubt, pushing forward the artillery subjects them to considerable loss, but it must be born in mind that artillery is effective still, with a considerable loss in its personnel. The old idea of never pushing a battery forward and looking upon the loss of a gun as equivalent to the loss of a color should not be encouraged. So also must it be remembered that artillery, once having obtained a good position, and doing effective work, must be kept in that position, even if at the loss of a gun or two, for it is better to lose several guns than lose a battery.

Colonel Brackenbury says:—"Guns should never retire from their original position without the express order of the general in command, but should continue in their place to the last, sacrificing themselves if necessary for the good of the other troops."

In laying down the fundamental principle that artillery should never retire, reference is made to artillery as being a unit, either in an advance guard or an army corps. Should it ever be necessary for an army or advance guard to retreat of course the artillery will have to retire with the rest of the army, maintaining its effectiveness, however, to the last moment.

A body of troops is forced, under certain circumstances, to retire sometimes only for a short distance, as in the case of an unsuccessful counter attack; sometimes altogether, as I said before, in the case of a general retreat, when an army is defeated. A retreat, however, may be purely voluntary, as, for instance, that of an advance guard falling back to a main position, or that of an army striving to gain a better strategic position. In all these cases the artillery is able to play an important part. The effect of retiring on the ordinary soldier is more or less demoralising, and artillery is the only arm which is insensible to mental influence. This insensibility to mental influences is derived, no doubt, from the peculiar nature of the service of the artillery arm.

It being more or less the scientific arm of the service, it follows as a natural consequence that the men cannot enter into all the "ways and means" and "pros and cons" that may be passing through the mind of their commanding officer, in drawing up or changing his line of offence or defence. An artilleryman, like every other good soldier, simply does as he is ordered, without being in a position to reason out in his own mind why such and such orders are given. The result is all the gunner is responsible for—the tactical and strategic responsibility resting with higher authority. It can seldom, or never, be practicable for a fraction of a battery or a subdivision to act on their own responsibility, yet it frequently happens that as small a component part as a file of men, in the infantry, may be called upon and compelled to act on their own judgment and discretionary influences.

It may be well here to say a few words as to the position and duties of artillery