

There is another important question bearing on this portion of the subject which should be considered, especially as the opponents of the Gatling gun found their chief objection to its supplementing artillery on the increased impediments thereby raising on the line of march. That a battery of twelve Gatlings must cover a considerable length of road is of course a fact that cannot be controverted, but comparing the space occupied with that covered by a battery of six 9-pounders, the advantage will tell considerably in favour of the Gatling, as is shown by the following table, also prepared by Colonel Wray:—

9 pounder Field Battery.		Length in yards.	Total.
6 guns, 8 horses	.....	19	114
12 waggons, 6 horses	.....	15	180
1 store waggon, 6 horses	....	15	15
1 forge, 6 horses	.....	15	15
1 General Service waggon } 4 horses	.....	11	11
1 store cart, 2 horses	.....	8	8
Total in yards		.....	353

Battery of 12 Gatlings.		yards.	Total
12 guns, 2 horses	.....	7	84
6 carts, 2 horses	.....	7	42
1 store waggon, 6 horses	....	15	15
1 Gen'l Service wagon and } forge combined, 6 horses	.....	15	15
Total in yards		.....	156

Should it be required to divide the battery, either on the march, or when about to come into action, the two captains would each take a half battery of 6 guns, or if subdivided, the three subalterns would command divisions of 4 guns, in place of 2, as in a field battery.

If you accept these calculations as correct, you will, doubtless, in the comparison between the Gatling and field artillery, give due weight to the comparatively small number of men and horses required for the former, as opposed to those necessary for the service of a battery of field artillery and will balance these advantages against the greater power and range of the field guns. There can, also, be little doubt but that Gatlings will, from their lightness, be able to move over ground impassible for artillery, and that, although their range may be less, their effect at distances under 1,200 yards will certainly be found to be more deadly.

In the Duke of Wurtemberg's pamphlet it is stated that the Prussian artillery usually open fire at distances varying from 1,400 to 1,600 paces, whilst Col. Reilly corroborates this statement in his evidence given before Colonel Wray's Committee, by saying that at an action at which he was present near Orleans, their horse artillery fired at 1,200 yards, or within the effective range of the small Gatling.

The traversing arrangement for spreading the shot during the time of firing, adapted to the Gatling gun, removes the objection raised against the French mitrailleurs, that they carried so close as to put several bullets into the same men, whilst the absence of recoil enables the fire to be steady as well as continuous, the rapidity being regulated at the discretion of the firer.

The questions before this meeting are, first whether the mitrailleuse or Gatling is

adapted for modern warfare under any circumstances. If so much be conceded, it remains to be settled whether it should be attached to infantry, or cavalry, or should form part of the artillery of an army.

On this point the balance of the evidence examined before the Committee inclined, with one exception, to make Gatlings a supplementary part of the artillery force.

Not that they should be attached to artillery batteries, but that they should be treated tactically in a manner similar to that arm of the service. Great independence has by a recent regulation been given to Officers commanding batteries of field artillery. They are now required to support the operations of the other branches of the service, without hampering their action by conforming too precisely to their movements. So with Gatlings. Officers in command of Gatling batteries will require an especial tactical training, and will have to learn their proper employment in the field. If for purposes of organisation these batteries should be composed of twelve guns it should be clearly understood that their division and subdivision for tactical employment would not only be probable, but would be almost certain, as I can conceive no situation where any large number of Gatlings could with profit be employed together. Their province would usually be to remain concealed behind some hastily raised breastwork, until the opportunity should arise of pouring forth their stream of deadly fire. To show themselves to artillery at the longer ranges in open country would be to court destruction; but to profit by their comparative insignificant size, and to bide their time until the enemy's infantry should advance, seems to be the rôle laid out for them in field operations. Now and then they might be called to the front, especially in enclosed country, but defensive rather than offensive tactics appear best suited for the full development of their powers.

As has been already stated, the Hungarian Government is reported to be in favour of attaching mitrailleurs to regiments of Militia, hoping by this means to give moral and material support to raw troops. To this opinion I would venture to dissent on the following grounds:—Infantry ought, under the present conditions of warfare, to be rapid in movement. Preceded by clouds of skirmishers, and pressing onwards in successive waves, they must, when once engaged sweep forward, availing themselves of all undulations of the ground for shelter from the enemy's fire. To wait for Gatlings, to rely upon them for support during their advance, or for cover when repulsed, would be to lose their elasticity, and would tend to lead men to depend upon extraneous help rather than on their own rifles and bayonets. The very ground that infantry would select for action would be unsuitable for wheeled transport. Regimental Gatlings would either hamper the action of the troops to which they might be attached, or would be left uselessly in rear, vainly endeavouring to follow, and seeking fruitlessly for opportunities for coming into action. The reason against attaching field guns to infantry would apply, only in a lesser degree, to uniting Gatlings with infantry. The action of artillery and of Gatling batteries should be separated from that of the infantry; each has its proper duty to perform, but these duties are distinct, and should consequently be kept separate.

None of the evidence was in favour of using Gatling batteries in place of horse artillery. The inferiority of their range to that of field guns would probably lead to their des-

traction if opposed to horse artillery on open ground suitable for cavalry operations. It is, however, fair to say that no practical experience has elucidated this question, and that some Officers hold contrary opinions to that which I have ventured to suggest. That they will be found most useful for flank defence of ditches, for sweeping the approaches in front of field works, for playing on the head of a sap, and for employment in the trenches and approaches of a besieging force, engineer Officers will, I think, allow; their lightness, handiness of movement, the absence of recoil, and the continuity of their fire, seem peculiarly to fit them for such uses. The necessity and yet the difficulty of bringing field guns into the advanced trenches to check sorties was felt during the siege of Sebastopol. The greater mobility of the Gatling, and its acknowledged superiority in deadliness of fire at short ranges to the 9-pounder field gun point to its employment in future sieges. How best to entrench it is also a question to be decided by Engineer Officers. To restrict its action within the limits of an embrasure would unduly diminish its powers, and prevent the development of the sweeping fire caused by the lateral movement of the barrels as they successively discharged their shots. For the defence of defiles and of bridges Gatlings are well suited, although, on the other hand, for attack against entrenchments or barricades they appear to be almost valueless. For naval purposes, such as have already been indicated, the Officers whom I have had the privilege of consulting agree that they will be found very valuable, and to this opinion I have as yet heard no dissent.

In a paper written by Captain Rogers, which appeared in the January number of "Once a Week," it was suggested that Gatlings might be usefully employed in some of our colonies, when small numbers of Europeans may be engaged against savage tribes. They are easier to work than artillery, and consequently would be better adapted for comparatively untrained men, such as colonial Volunteers must, from the circumstances which surround them, frequently be. They are readily moved through districts when the roads would scarcely admit of the passage of field guns.

On all these points, and doubtless on others which have escaped my observation, I would direct your attention, and trusting that the evidence I have been able to collect may prove of use in enabling you to form conclusions on the important question involved in the employment or rejection of this description of weapon, I leave the matter in your hands, availing myself of this opportunity of thanking Colonel Wray, Captain Beaumont, the officers of this Institution and others, for the information they have afforded me on several technical matters relating to the subject.

The Mechanism of the Gun.—On the mechanical construction of the gun I have purposely refrained from touching, the subject of the lecture being the employment of the mitrailleuse in war. A description of its several parts will be found in Mr. Gatling's paper published in this Journal, whilst the gun itself is present for inspection.

On two points only do I wish to make remarks. The feeding apparatus by means of a drum containing 336 cartridges has replaced the hopper previously used. Thus the rapidity of fire has been greatly increased, and the risk of the jamming of the cartridges removed. The diameter of the bore has been made similar to that of the new Army rifle, the Martini-Henry; The