

lery directed against the attacking line, although very serious for them, did not materially injure the supports or reserve. The percussion shells and time shells were designedly burst in front of the body aimed at, and the splinters rarely reached the rear. In fact, the rear column mainly suffered from those shells which were "over," and which had, consequently, missed the object at which they were directed.

It may naturally be asked. Why place your supports and reserve immediately in rear of your attacking line? Why place these bodies of troops in a position in which they must necessarily fall in for the bad shots which have been directed against their "shooting line?" A little consideration, however, will show that there is no help for it. When a general advance is made, battalions or half-battalions will move forward side by side, and will occupy a large extent of ground. If an echelon movement be possible it will naturally be adopted, but all depends upon the amount of ground available and the number of troops operating. There is no rigid rule in this formation. The officer in command of the attacking line is responsible for moving as fast as he can towards the enemy; the officer commanding the supporting line is responsible for the formation which these supports should take, bearing in mind that his first duty is to "feed" the attacking line, and his second duty to afford his men protection from fire. The same may be said of the reserve.

The Okehampton trials cannot be taken as representing what would actually occur in battle. Indeed, if they were taken as such, they would show that no troops in any formation whatever could move under such a fire, and that an attempt to show themselves at any range under 3,000 yards would be followed by speedy annihilation. We must, therefore, except at very long ranges, make a fair allowance for the fact that no bullets were whistling about the gunners' ears, no horses and men falling, no battle excitement. But admitting all this, we must arrive at the conclusion that the fire of modern rifled guns is something awful to contemplate. A column of Infantry consisting of 400 men in very open order—that is, with a front of about 100 paces and a depth of about 30 paces—may experience a loss of over 100 men, or one-fourth, from the fire of one battery of six guns in a few minutes at 3,000 yards, or nearly two miles. A column of Cavalry consisting of about 300 sabres in quarter distance column of squadrons might lose half their number if they exposed themselves for one minute at 2,000 yards, or nearly one mile and a quarter, to the concentrated fire of a battery of 36 guns—that is, six batteries massed together. One volley from such a battery at this distance would almost annihilate them.

With regard to the comparative merits of the different projectiles used at Okehampton, we may mention that the 36 rounds of Abel's "water shell," at 2,000 yards, scored the enormous number of between 3,000 and 4,000 hits, and caused a havoc that was frightfully suggestive. We recommend a study of these statistics to the umpires at our Annual Manœuvres. In fact, the whole cost of the experiments at Okehampton would be amply justified if they had the effect of impressing upon the minds of the officers who undertake the very responsible duties of umpire on these occasions the folly of allowing troops in masses, both Cavalry and Infantry, to manœuvre under the very noxes, as it were, of batteries of artillery which would speedily sweep them off

the face of the earth if they were firing shotted guns.

We cannot but regret that a greater number of experienced officers of Infantry and Cavalry were not sent officially to witness these trials. The results are in the highest degree important to all branches of the service, and so good an opportunity may not occur again for some years. We are glad, however, to see that an Infantry officer, Major East, attached to the Intelligence Branch of the War Office, attended the experiments, and the programme drawn up by him may justly be said to be one of the most instructive of the whole series.

Major East proposed to ascertain the possibility of a battalion of, say, 600 men capturing the guns of a battery in an entrenched position by a series of rushes of Infantry. The battery was supposed to be holding an entrenched position covering a retreating army, with orders to remain to the last. Its limbers and horses had been placed in security; its flanks were protected, although its escort was supposed to have vanished; and the attack was to be made in front. The 16-pounder battery, under the command of Major Boradale, was selected for this experiment, as it was likely that in such circumstances a heavy field battery would be told off for such a duty. The conditions were as follows:—The Infantry, in the normal formation, were suddenly to appear over the crest of a hill at 1,000 yards distance; they were to advance to 600 yards in a series of rushes running, lying down, and firing, but exposed in this distance for four minutes, during which the battery might fire. They next advanced from 600 to 400 yards in a similar manner, the time of exposure being two minutes. From 400 to 200 yards they again rushed for two minutes. Lastly, at 200 yards and 100 yards the rushes were in one minute each. The formation of the dummies was to be altered according to distance. At 1,000 yards they were in the normal formation, with attacking line, supporting line, and reserves at the usual intervals. At 600 yards the supporting line was considerably reinforced, and at the shorter distances the battalion was supposed to be, in a swarm, rushing on the battery. As the dummies could not advance—a patent dummy possessing this much to be desired qualification not having yet been invented—the battery limbered up and moved forward after each period. Before commencing the battery was supposed to have lost two men in each detachment from casualties, so that the guns commenced action with seven gunners each, instead of nine. Corresponding losses were supposed to have been sustained at the successive distances, until at last the detachment of each gun was reduced to two at 100 yards. The officer commanding the battery was to use his own judgment throughout as to the rate of firing and the body at which his fire should be directed. He commenced with time shrapnel, and in the first four minutes—that is, in the rush between 1,000 and 600 yards—disabled 71 of the attacking line (100 men) and 24 of the supports. At 600 yards, firing for two minutes shrapnel with time fuzes, the battery disabled 95 of the attacking line and 35 of the supports. The attacking line was now reinforced and extended, and the battery came into action at 400 yards for two minutes, firing Shrapnel shell with time fuzes, and disabled 117 in the attacking line and 39 in the supports. The battery then moved in to 200 yards and fired case shot at the "swarm" for one minute, disabling 50; it then moved in to 100 yards, and having exhausted its case shot, fired

for one minute Shrapnel shell reversed—that is, Shrapnel shell with the plug removed, no fuze, and loaded with the head next the cartridge. This result in the explosion of the shell at the muzzle and an action similar to case shot; the disabled were 113. Thus, in ten minutes the battery had disabled 578 men out of the 600 who had attempted to attack it, and without throwing any doubt on the courage of the remaining 22, we may fairly surmise that they executed that masterly manœuvre which enables a man to fight another day. This result clearly proves that a battery can protect its front from assault even under severe conditions.

It is, of course, possible for attacking Infantry, if unmolested, to creep up under cover if the ground admits of it, and pick off the men of a battery one by one until nobody is left to work the guns; but such a case must be looked upon as altogether exceptional. In the majority of cases batteries would have their escort, either Cavalry or Infantry, and skirmishers who attempted to take a battery in such a manner would be met by skirmishers.

One of the maxims of war laid down by Napoleon was that "no Infantry, however, brave can with immunity march ten or twelve hundred yards against a strong battery of artillery well placed and well served; before it could accomplish two thirds of the distance these men would be killed, wounded, or dispersed." Although this opinion was given in the days of old "Brown Bess," and in times when Infantry attacked in massive columns, it appears to hold good equally in these days "Martini Henry" and "loose formation." Every one who witnessed this experiment at Okehampton went away convinced that it would be a practical impossibility to advance over ground swept by such a frightful fire.

As another proof of the efficiency of modern field artillery, against a loose formation, we may instance the practice against skirmishers supported by reserves lying down in rear, which was exhibited a few days before the close of the experiments.

The skirmishers were supposed to be attacking a position held by Infantry at about 400 yards from their front. They were partly kneeling behind stones and uneven places, partly running forward to take up a fresh position; and while doing so were consequently exposed. The formation was very open, and the men were represented by short dummies—that is, dummies cut short at the knee. Just as they appeared over the crest of a ridge they came under the fire of a 16-pounder battery, which was supporting the threatened position at a distance of about 2,000 yards from their left front. The battery opened fire with Shrapnel shells and time fuzes, and in six minutes had disabled 44 per cent. of the skirmishers and 5 per cent. of the troops lying down in rear; many of the dummies were riddled with bullets.

The manner in which the battery served their guns on this occasion deserved the admiration of all who witnessed it. Indeed, the shooting of both the batteries at Okehampton—namely, E Battery E Brigade Royal Horse Artillery, commanded by Major Holberton, and C Battery 25th Brigade Royal Artillery, commanded by Major Boradale—leaves now little to be desired. These batteries, moreover, were not specially selected, but were taken because they happened to be stationed near the spot—the Hon. Artillery at Exeter, the field battery at Devonport. We may, therefore, accept them as fairly representing our Field Artillery when they joined the camp