

Secondly. Deprive of his allowances any captain who fails to take his certificate.

Thirdly. Place the calling out of the troops at the discretion of the various D.A.G's. But make it compulsory that only the officers, non-commissioned officers and ten men per company shall be called out in each battalion.

Fourthly. Let it be that at as early date as possible every three or four battalions be grouped into brigades with a higher rank than Lieut.-Col. for our commanding officers to look forward to. Let there be also a system of compulsory retirement, which will ensure the advancement of younger officers and keep the life blood "ambition" stirring.

That the proposition to cut down the numbers of men taken to camp will meet at first with disfavour is true; but the more the question is mooted, the stronger the feeling grows that it is a mistake to bring a lot of men to camp for twelve days each two years, and expect them to instruct each other in details and principles which only an average of three or four officers per battalion know anything at all about. That this move would be unpopular is unlikely, as the more it is understood the more common sense it will be seen to be. I believe that a good militia is, with the march of invention and improvements, becoming more possible than ever before; also that a bad militia is worse than useless.

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Major Mayne on Infantry Fire Tactics—II.

(Continued from Page 387.)

Estimation of Ranges and Backsight Elevations.—But as it is necessary in all cases to know the range in order to obtain an effective fire, I will briefly enumerate the different ways in which the range can be ascertained with more or less accuracy: 1, by direct measurement; 2, by range finding instruments; 3, by surveying instruments; 4, by comparing known heights, the distance of one of them being known; 5, by measurement from maps; 6, by estimating by sound; 7, by the practice of the artillery near at hand; 8, by watching the "strike" of the bullets; 9, by estimating by eye. Of these methods the first can only be used by the defence before the arrival of the enemy; range-finders are as yet only suited for Artillery purposes; surveying instruments can only be used in stationary warfare, such as sieges; the results obtained by comparing known heights are not very reliable; and maps of a suitable scale for measuring ranges on are rarely available. The most practicable methods on the battle field are the 6th, 7th, 8th and 9th. But to estimate by sound, we have to wait for the enemy to open fire, and it is only suited to the commencement of a fight, before much firing takes place; from the ranges found by the Artillery, we must allow for the distance of the Infantry in front of or in rear of the Artillery, and also for the distance between the target being fired at by the Artillery and the target that the Infantry have to fire at. But this means of finding the range is only suited to the moment when the Infantry are passing the Artillery during their advance. "Picking up the range" by watching the strike of the bullets should always be done; but this requires suitable ground for the bullets to fall on, and great care is required in making such observations, for reasons to be stated presently. In reality the only available means by which ranges can be estimated at all times is by the eye. This, however, requires much practice over varied ground and under different conditions to obtain even moderately good results. For instance the average errors of *trained* men are as follows: at 300 yards, one-tenth the estimated range; at 600 yards, one-eighth; at 1,200 yards, one-sixth. This being the case we must accept it as one of the factors we have to deal with, and make the necessary allowances for it. How this can be done will be explained presently. But a very good custom may here be mentioned. In the German service the best six men at range finding by eye, in each company, have the duty of guessing the range and calling out the estimate of it to the Company Commander entirely thrown on them. The Company Commander then uses the mean of the estimates as a basis for his orders.

When the range is once known then allowances must be made for any movements on our or the enemy's part. But the range being known, the duty of those looking after the men does not end with ordering the men to adjust the slide on the backsight to the engraved graduation for that range and to seeing that they do it.

The rifle is sighted for a temperature of about 60° F., a barometric pressure of 30 inches, a still atmosphere and a horizontal line of sight. If the temperature and barometric pressure differ from these data, then the range for a given backsight graduation alters; and further, a head or rear wind will make a bullet fall short, or go further respectively, while a side wind will drive the bullet to one side. The heating of the rifle

barrels and the condition of the fouling in the barrels will also have their effect on the proper elevation to be used. So that whatever elevation is ordered to be used it must be looked on as an approximation to the truth, and the fire must be carefully watched to see if any corrections are required to be made to the backsight elevations ordered to be used. Further, if a line of sight is inclined upwards or downwards the elevations used must be less than when the line of sight is horizontal. For instance, with the Martini-Henry rifle, if the line of sight is inclined upwards 40°, we must use the 500 yards elevation to hit an object 600 yards away; and if the line of sight is inclined 40° downhill we must use a still lower elevation. These statistics are only given to illustrate the necessity for officers to watch the effect of the fire of their men carefully in order to correct, if necessary, the backsight elevations being used.

The Evil of Uncontrolled Fire.—We have always to consider infantry fire under two aspects—viz., (a) Uncontrolled or independent fire; (b) Controlled fire. *Uncontrolled firing* takes place when each man chooses his own target, his own elevation, his own rapidity of fire, and his own times for opening and ceasing fire. *Controlled fire* is the exact converse of this.

It is almost needless to say that uncontrolled fire should be absolutely prohibited, as it invariably leads to confusion, disorder and demoralisation, while causing a waste of invaluable ammunition at a period when it is impossible to replenish it in sufficient quantities to make up for the consumption. Further, an uncontrolled fire in which each man chooses his own objective and backsight elevation, when in a state of great moral excitement and mental strain, is very inefficacious. An uncontrolled fire when once started under such conditions will probably not cease until the last round has been expended, and will very probably have been directed for the most part wildly into the air. The great fault of all shooting in the field, especially at the closer ranges, is that it is too high.

Individual Firing.—Thus confining our attention to controlled firing alone, we have to deal with it under two conditions:—

(a), Individual firing; (b), collective firing. Of these two the latter should be the general case in battle; the former should only be used in the final stages of battle, and in some special cases, as on outpost work, &c. But as individual firing at all ranges is held in such esteem throughout the whole Imperial, including in this term the Colonial, forces, it is necessary to thoroughly understand its capabilities.

The first thing I desire to impress on you, gentlemen, is the utterly false impression one is apt to get of individual firing from ordinary target practice, when firing a few rounds only over measured and known ranges, with the result of each shot being signalled back. Under such conditions the nearer we get to the target the better is the shooting. But in the field, ranges are not known exactly, the enemy does not signal back whether you have missed him or hit him above or below the point on him that you aimed at; the men are probably tired for want of sleep, parched with thirst, hungry for want of food, and fatigued after a long march under a hot sun, over bad roads, or by an advance by rushes under fire; if the advance has been rapid the men lose their breath, their chests heave, their arms get tired and the rifle cannot be held steadily, especially if a wind is blowing, and when the men are unnerved and excited by the danger arising from the fire of the enemy, which important cause of disturbance is always absent in peace practice. The nearer the enemy is approached the greater is the effect of this adverse condition of things, added to which is the painful effect of the recoil after 40 or 50 rounds have been fired, and the effect of the disorder, demoralisation, and excitement which occurs in all fighting and danger. The mass of the men will, under such circumstances, forget to adjust their sights to the range; they will use a full foresight if they use any at all: they will probably aim at the enemy's chest, and many will even discharge their rifles from the hip. Consequently the fire is usually much too high and decreases in efficacy as the range gets shorter, which is just the opposite to what we find on the ordinary ranges. It is very important to remember this, for it has frequently been observed that when men find that they apparently cannot hit an exposed enemy at what seems to be an easy range, they get discouraged after two or three rounds and then fire wildly. One well-known French writer asserts that in the field an average shot will fire at an isolated standing enemy, who is supposed to remain stationary, the following number of rounds to put him out of action; five to six rounds at 330 yards; 10 to 12 at 440 yards; 14 to 16 at 550 yards; and 30 to 34 at 660 yards. Another French writer estimates that three times the above amounts of ammunition are required at the same ranges!

Hence it is very important not only to remember but also to warn the men not to expect very much from their individual fire in the field, and that they should not be discouraged even by a series of misses. Even at target practice a good shot may miss a standing man at ranges over 400 yards and yet be shooting well.

Here I must remind you again, gentlemen, that we must accept