

human nature as we find it, and make the best use of what we have. The problem, therefore, is: Accepting the fact that individual fire in the field is, as a rule, especially at long ranges, inaccurate, how can we reduce this inaccuracy and make the best use of the troops?

Major Mieg, of the Bavarian Army, offered a solution to this problem in about 1876, and his solution, made public in 1878, was adopted first by the German Army, and then by every European Army, but our own, *in toto*. We are gradually adopting these ideas, which I will now explain.

In the first place, to reduce the inaccuracy of individual fire as much as possible, it must be confined to such ranges at which the bullet does not rise more than the height of a man above the line of sight. The limiting range for the Snider rifle is, under such conditions, 350 yards. Then by using the 300 yards backsight to make up for the effect of the full foresight which the men *will* always use in the field, and by always aiming at the enemy's feet, he will be hit somewhere so long as he is anywhere inside of 350 yards distant. In this way the range need not be guessed nor the backsights touched when the enemy is once within 350 yards. Some writers advocate the use of the 200 and even the 100 yards elevation throughout these short ranges, with low aiming, to counteract the well-known tendency to fire high, especially when men are excited.

Such a fire is a *grazing fire* and is called a *fire of certainty*, relatively of course, to distinguish it from the collective fire at longer ranges, of which we are to speak of presently, and which is a *dropping fire* or a *fire of probability*. In a grazing fire we do not require to know the range; but it is essential to approximately know the range for a dropping fire if we desire even fair results.

Sub-division of Ranges.—Before passing on to consider the characteristics of a collective fire of probability, we must refer to the *sub-division of ranges* which is now usually accepted. These sub-divisions are as follows: 1. *Short*, up to extent of grazing fire, 350 Snider yards, 400 Martini-Henri yards; 2. *Medium*, from the short up to double the extreme short range, 700 Snider yards, 800 Martini-Henri yards; 3. *Long*, from the medium up to highest graduation of enemy's rifles, about, 1,700 Snider yards, 1,700 Martini-Henry yards; 4. *Extreme*, all ranges over the extreme long ranges.

In the *short* ranges, controlled individual firing is allowable, because the time has passed for concentrating the fire on particular points; these points have already been prepared for being assaulted by having been subjected to a heavy fire, and the assaulting troops have been directed on them, and each man has now to advance to his direct front and fire at the enemy immediately in his front.

Collective Firing.—But at ranges over the short ranges the men's fire must be directed on such points where the enemy's resistance is greatest, and for this purpose a *concentrated collective fire* must be employed. Suppose that the statement is correct that in the field a man has to fire 30 shots at 660 yards to hit an upright enemy. In making this statement we have to further suppose that the enemy will stand still to be fired at, which, however, he will not do; so that the soldier, if he misses in his first shot, will not have the opportunity of firing his 30 rounds. To overcome this difficulty we can make 30 men fire at the enemy and then one or more is sure to hit. Another advantage is gained in so doing—namely: That when one man fires 30 rounds, half his ammunition supply is gone, and he has taken some time to do this, whereas if 30 men fire, they have only expended one round each, and have obtained the desired result at once. This is the principle involved in concentrating collective firing on certain stated objectives. It is very important to remember this principle, especially in irregular warfare, when, as so often happens, the enemy are individually better shots than our own men. The peculiar characteristic of this kind of fire is that it covers a belt of ground at least 100 yards in depth on horizontal ground with dropping bullets. The mass of the bullets fired (70 per cent.) fall within this beaten zone, as it is called, of 100 yards in depth on a horizontal surface. This holds for all ranges beyond the short ranges. The cause of this spread of bullets is due to the fact that different men will not adjust their backsights to the same point, will not use the same amount of foresight and will not keep their sights upright; some will jerk the trigger, others will not have their rifles steady at the instant of discharge, etc. It is on account of this longitudinal spread of the bullets that a collective fire at the longer ranges is called a *fire of probability*; the object is to so cover the ground on which the enemy is with bullets, as to make it probable that some of the bullets will take effect. The efficacy of such a collective fire, supposing it well placed, depends on the drop of the bullet measured with reference to the line of sight. The less the drop the better the effect of the fire, and as the drop decreases as the range decreases, a collective fire also rapidly increases in efficacy as the range decreases.

(To be Continued.)

A Novel Rifle Competition.

In connection with the recent South African Wimbledon, his Excellency the Governor, and Lieut.-General Cameron, C.B., each gave £10 for prizes in a sectional competition of ten non-commissioned officers and men from each corps of the Army, Colonial and Volunteer Forces, in which the general plan was advance of a square or section as part of a fighting line attacking an enemy. The enemy was represented as debouching on the range to take up a position in front and as having taken up that position. The object of the competition was as a preliminary on the rifle ranges to company and battalion field-firing on unknown ground, and to inculcate the necessity of much more careful individual shooting on those occasions in order to obtain the highest results in collective and mass-firing without checking that steady rapid advance on the enemy which is essential on the field of battle. The enemy consisted in the first instance of a line of skirmishers, followed at a distance of 200 yards by a support and two guns with their detachment.

The skirmishers were represented by figure targets, six paces apart, and equal in number to the attacking section, and the support by a sectional target, 6 feet by 16 feet. The competing section was placed in extended order, lying down position, at six paces interval, 1,000 yards from the enemy's support; one man being told off to each figure. Three volleys were fired at the support, three each at the right and left hand guns, and finally in the first stage three at the skirmishers, five minutes being allowed for the twelve volleys. Hits were then counted, and for each man and also for the section recorded and signalled. The second stage consisted of one volley each at 700, 600 and 500 yards, advancing in quick time; any military position allowed, firing to be completed within twenty seconds from the order "Fire a volley." In the third stage, head and shoulder dummies were used, all firing off the knee. Three rushes were made of 60 or 70 yards between 500 and 300 yards; time for firing as before. The sliding bar at the back of the rifle might be used up to the end of the third stage.

In the fourth stage fixed sights only could be used, and the rushes were only of 40 yards, only fifteen seconds being allowed for each volley. The fifth stage consisted of three rounds of rapid independent firing, one minute being allowed for it. In the final stage, figure targets, 6 feet by 2 feet, represented the enemy retiring. After a charge of 80 to 100 yards the order, "Halt, commence firing," was given, and three rounds of rapid independent firing had to be completed within 21 seconds, the men standing. No sights were allowed. Each man fired in each stage at the dummy opposite him, each hit counting one, as they did on the screens. After each stage the men were faced to the rear till they commenced firing rounds. The winner of the Governor's prize was to be the section making the highest collective score, and the winner of the General's prize the person making the highest individual score.

Militia General Orders (No. 14) of 28th November, 1890.

No. 1.—ACTIVE MILITIA.

1ST REGIMENT OF CAVALRY.—No. 2 Troop. The surname of the 2nd Lieutenant whose appointment was notified in General Orders (2) 4th January, 1889, is McComb, and not as stated in that General Order.

1ST BRIGADE FIELD ARTILLERY.—To be Adjutant: 2nd Lieut. J. A. Ross, G.S., from No. 1 Field Battery *vice* J. Davidson, promoted.

No. 2 Battery.—2nd Lieut. Thos. McCrae, R.S.A., is confirmed in his rank from 20th September, 1890.

TORONTO FIELD BATTERY.—2nd Lieut. L. E. W. Irving, R.S.A., is confirmed in his rank from 16th July, 1890.

MAHONE BAY BAT. GARRISON ARTILLERY, N.S.—To be Captain: Lieut. P. A. Ernst, R.S.A., *vice* Edward James, who resigns.

To be Lieutenant, *prov.*: George Henry Alfred Strum, *vice* P. A. Ernst, promoted.

3RD BN. VICTORIA RIFLES OF CANADA.—To be 2nd Lieutenant: 2nd Lieut. G. A. Sicotte Hamilton, M.Q., from 14th Bn., *vice* J. E. Fidler, who resigns.

5TH BN. ROYAL SCOTS OF CANADA.—2nd Lieut. M. A. Rafferty not having qualified or reported for duty, his name is removed from the List of Officers of the Active Militia.

6TH BN. FUSILIERS.—Paymaster and Honorary Captain David Seath to have the Honorary rank of Major, as a special case.

7TH BN. FUSILIERS.—To be Captain, *prov.*: John Mackenzie Moore, *vice* J. W. Cowan, resigned.

To be Lieutenant, *prov.*: Thomas John Coe.

19TH LINCOLN BN. OF INFANTRY.—To be Major, from 3rd January, 1889, as a special case: Captain and Brevet Major James Hiscott, R.S.I., *vice* G. C. Carlisle, promoted.

22ND BN.—No. 6 Co.—Lieut. Wm. Andison, R.S.I., is confirmed in his rank from 16th September, 1890.

32ND BN.—No. 8 Co.—Lieut. J. R. Wraith, R.S.I., No. 8 Co., is confirmed in his rank from 2nd November, 1890.

46TH EAST DURHAM BN. OF INFANTRY.—To be Major: Captain and Brevet Major H. A. Ward, V.B., from the Adjutancy, *vice* John McDermid, deceased.