

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.

The *dangerous zone* of a collective fire is the beaten zone (about 100 yards on horizontal ground) *plus* the grazed zone of the bullets falling at the end of the beaten zone nearest the firer. This grazed zone is the distance over which the bullet remains under the height of the target above the ground on which the target stands.

If the beaten ground slopes upwards with reference to the line