

57-millimètre guns were ordered from the Hotchkiss firm because the Nordenfeldt firm could not execute the whole urgent order of the English Admiralty in the short time given for the delivery.

At the last Russian trials with Nordenfeldt and Hotchkiss quick-firing guns of 47-millimètre and 57-millimètre calibre, the backward and forward action of the breech (Nordenfeldt's system), compared with the up and down moving breech-block in the Hotchkiss gun, was considered (after Roos) as an advantage, viz. :—

(a) The fired cartridge cases can be more easily (*i.e.* quicker) taken out without jamming after firing.

(b) The gunner can more easily throw out the cartridge case by the hand-lever, and quickly open the breech.

(c) The hand lever gives great help in putting in the new cartridges at the moment the breech is closing.

By the Hotchkiss system it was rather difficult to extract the empty cartridge cases, and it also happened that they all had to be extracted by hand, and the fingers got burnt, and the consequence was a delayed fire.

Besides, the Hotchkiss extractor has frequently not been fit to extract from the barrel the very often expanded cartridge cases; this was especially the case with the 47-millimètre gun, the breech block of which is very light, and during its perpendicular movement downwards it only moves a very little way, for which reason the extractor also moves very little, and thus it cannot sufficiently draw back the cartridge cases. On the other hand, such delays have never happened with the 47-millimètre and 57-millimètre Nordenfeldt guns with their simple and solid parts.

Further, in the Hotchkiss quick-firing gun the cartridge has to be entirely put into the chamber by hand, that the upward moving closing wedge may not turn it out. In the Nordenfeldt gun the man has only to put in the cartridge half-way, and the closing block will do the rest. The Nordenfeldt gun can be fired either by a lanyard, or it fires at the last moment when the action block closes, whereas with the Hotchkiss this can only be done in one way, therefore this system is also inferior in quick firing to the Nordenfeldt's system by eight shots per minute. As Roos tells us, at the Russian trials at Ohta, a shell exploded in the barrel of a 57-millimètre Hotchkiss gun, by which the barrel was so damaged that the trials had to cease immediately, and the firm had to find another barrel. Such an explosion could not happen with the Nordenfeldt 57-millimètre gun.

A further difference in the two competing systems was the mounting of the guns. Nordenfeldt's 47-millimètre and 57-millimètre guns had a carriage with only 4-inch recoil, after which the gun returned automatically to its former position, and it was also mounted on a carriage without recoil at the request of the marine artillery, which was trained by a shoulder piece. The Hotchkiss gun was only arranged on the latter principle, but the gunner had to receive the whole shock on the shoulder, whereas by the Nordenfeldt gun with this system the shock is weakened by using powerful hydraulic breaks, and the safety of the gun secured.

Generally the results of the comparative trials in August, September, October, 1886, on the Ohta field, near St. Petersburg, are the following:

	Nordenfeldt.		Hotchkiss.	
	47 mm.	57 mm.	47 mm.	57 mm.
Weight of the barrel (kilogs).....	216 .. 330	....	233 .. 380	
“ “ shot “	1'5 .. 2'72	....	1'5 .. 2'72	
“ “ powder (grains)	790 .. 1330	....	790 .. 890	
Muzzle velocity (metres).....	630 .. 635	....	600 .. 550	
Shots per minute	28 to 32	....	20 to 24	
Ten shots to hit the target took (seconds)	42	....	52	

As to the last figures, it must be remarked that at the trials the firing was at four targets in several directions at distances of from 600 to 1,200 millimètres, and were models of small torpedo-boats. The sighting gunner had, when firing, always to change the aim. Nordenfeldt's gun hit the target nine times out of ten shots—equal to 90 per cent. hits. The Hotchkiss gun, of the same calibre, hit only thrice out of ten shots, and then only the nearest target—*i.e.* 30 per cent. hits.

Both guns were served by an equal number of men, and the work was done in the same way; but the better method of sighting and training the Nordenfeldt gun was shown by the greater preciseness of the shots, especially at the trials imitating a naval fight with movable targets. Also the penetrating power was greater with the 57 millimètre Nordenfeldt's system than that by the Hotchkiss system.

The Russian army has also unconditionally given the preference to the training by screw and worm wheel than by shoulder-piece (Hotchkiss), and they have done so for the following reasons:—

1. By the first method the training can be made more exact and relied upon, and at quick firing also quicker.

2. The sighting gunner works quieter and more coolly when he is not in fear of, and tired out by, shocks of the recoil on the shoulder.

3. By training by screws or a similar mode the gun cannot change its position.—*United Service Gazette.*

The Kriegsspiel, or War Game.

By Lieut.-Col. G. H. J. Haldane, late 64th Regt., in the "Volunteer Record."

ONE of the many points which the successes of the Prussian army in the Franco-German war have impressed on the minds of military men, is the utility as a means of tactical training of the "Kriegsspiel," or war game, affording as it does an almost perfect picture of the difficulties, chances, and changes of the battle field; and next to the actual practice of peace manœuvres, enabling the mind to realize the space occupied by troops, either when deployed or on the march, and the time required to transport bodies of men from one point to another. It also excites a spirit of emulation, and enables those who have not the opportunity of commanding large bodies of troops or of manœuvring them across country, at any rate to study the art of troop-leading under the closest possible copy of the difficulties that beset a commander. But, I hear some one say "such a game must be exceedingly complicated," and so, no doubt, it is; but still it can be made simpler or more difficult to suit the skill of the players, and the man whose mind would fail to grasp the meaning and intention of the movements of little colored bits of lead on a map in a quiet room, would scarcely be fit to undertake much in the hurry and excitement of a field-day, or amid the dangers and emergencies of an actual campaign.

Without entering into all minute details which serve to make this game such a faithful representation of war, I propose to give my readers a general idea of the manner in which it is played, leaving those who may be tempted to go deeper into the subject to the study of more elaborate treatises.

The two players represent the commanders of two opposing forces, and the tools with which they work—for it can scarcely be called play—are a duplicate set of maps on the scale of six inches to the mile, showing all the features of the country, and including a sufficient space for the proposed "operations," a set of little blocks of lead, colored for one player red, and for the other blue, representing on a scale suitable to that of the maps, battalions of infantry in different formations, squadrons of cavalry, and batteries of artillery, besides sundry rules and scales for measurement.

But now we come to the most important items, these are the chief umpire and his assistants. The chief umpire must be an officer of judgment and experience, well acquainted with the theory as well as the practice of actual warfare; and the more his assistants partake of these qualities the better.

Some days before that fixed on for the game to be played, the umpire communicates to each player what is called the "general idea," that is to say, a short sketch of the objects of the campaign which is supposed to be taking place, and containing only such information as would fairly be in the possession of both parties, such as the following:—

"An invading army (blue) has effected a landing on the coast, and occupies Colchester, Harwich, and Ipswich, intending to march on London. A defending army (red) is assembling in Hertfordshire, and moves to cover London."

Besides this general idea, which, as I have said, he gives to both players, he communicates to each one separately, and under the seal of secrecy, what is called the "special idea," and which contains that portion of the scheme which affects the player's own particular body of troops. These would run probably in the following form:—

"Special idea, blue."—"To the officer commanding brigade at Marks Tey; bivouac to-night near the junction; to-morrow at 4 a.m. march on, and if possible occupy Chelmsford. A force of the enemy nearly equal to your own is moving this afternoon to Dunmow; blue's force to consist of 6 battalions of infantry, 2 squadrons of cavalry, 2 batteries of artillery (9-pounders), and 1 company of engineers."

To the other player is given the following:—"Special idea—red."—"To the officer commanding at Dunmow. Move off to-morrow at 4 a.m. and take up a position covering Chelmsford. A body of the enemy, stronger than you in infantry but weaker in cavalry, is reported to be moving from Colchester along the direct road to London. Red's force consists of 4 battalions of infantry, 1 battalion of Essex rifle volunteers, 4 squadrons of cavalry, 1 battery artillery (16-pounders), 1 troop horse artillery, and 1 company of engineers."

The two players being thus armed with their general and special ideas, set to work to study the maps and prepare their respective plans of operations, and here we must notice one great merit of the game. That while the ideas furnished to them by the umpire are just such problems as might occur in actual warfare, so also the players have to mature their plans, and write out the necessary orders, exactly word for word, as if the following morning they were going to move two real living forces of soldiers towards each other to meet eventually in the actual crash of combat.

These preliminaries having been carried out and the umpire in possession of the intended plans and orders of each side, it now remains