

and that a greater rapidity of firing could be obtained, and yet with all these advantages it was not until 1837 that the flint lock was abandoned.

The word "artillery" is said by some to be derived from "artellaria," signifying bows, arrows and all implements of projectile warfare, and by others from the French word "artiller," but its general signification denotes all kinds of missiles, with the engines propelling them. In the modern acceptation of the term it has been appropriated for the larger sort of fire-arms, whilst in medieval times it naturally referred to bows and arrows. Stowe (an old writer) defines the word as the art of shooting in long bows, cross bows, stone bows, scorpions, rams, catapults; as also in cannons, basilisks, culverings, sakers, falcons, minions, fowlers, chambers, muskets, harquebusses, calivers, petronels, dags. In the authorized version of the Bible of 1611, it would seem to denote the bow, for we read in 1 Sam., xx., 40, that "Jonathan gave his *artillery* unto the lad," who had already picked up his arrows. The application of gunpowder to projectile warfare, and the use of cannon became general in Europe during the 14th century. Mention, however, is made of isolated instances of their employment at earlier periods, especially among the Moors. Artillery is said to have been used by Henry III of England during the rebellion of the Duke of Gloucester in 1267, and by the Spaniards against Cordova in 1280, and Gibraltar in 1306. It is, however, held that the first unquestionable testimony of the employment of cannon was by Edward III in 1338, and they were then called "crackys of war." Bombards were employed by Louis XI during his Flemish campaign, some throwing iron and others stone balls. Up to the reign of Henry VIII the practice of gunnery was very rude, and the first attempt to reduce it to definite principles was made by an Italian named Tartaglia, who prepared a treatise concerning the theory and practice of gunnery as then understood. Though correct in many of his statements, some of them were simply ludicrous, as for instance, he attributed the cause of the recoil to the rush of air into the bore to fill up the vacuum caused by the discharge of the powder; and gravely stated as a fact, that on one occasion an unfortunate small dog was sucked into the bore of a gun after its discharge, by the rush of air. He also gave a receipt for causing "any great piece of artillery to make an exceeding great noyse and a marvellous rore," which was to place a piece of lead, or shoe leather, between the powder and the ball, and also to introduce a little quicksilver into the touch-hole.

We read of a bombard, cast in 1453, which was 15 feet in length, weighed 15,356 lbs., and threw a stone shot 18 inches in diameter, weighing 300 lbs. In 1807, when Sir John Duckworth passed the Dardanelles, his ships were struck with shot weighing between 700 and 800 lbs. In 1651 Charles II. marched over the Scottish frontier with a large army and 16 leathern guns by the way of artillery. All the early cannon were breech-loaders, and at first they were built of bars of wrought iron hooped or banded together. The well-known bombard "Mons Meg" now mounted on the walls of Edinburgh Castle and used at the sieges of Dumbarton and Norham in 1489 and 1497, is constructed in this manner. There are rifled cannon of the sixteenth century in the museum of the Hague, and one in the arsenal at Berlin, dated 1661, is rifled with 16 grooves, and one at Nuremberg, dated 1694, has 8 grooves.

It is not proposed to allude any further to cannon, except to say that with the improvement of fire arms, so have they followed in the manufacture of ordnance. By the perfection to which machinery has been brought the requisite materials for all artillery purposes can be easily wrought, and thus great accuracy is obtained in the manufacture of warlike stores. By the application of chemistry, the constituents, and the most advantageous employments of the various substances employed in the military arts, can be ascertained. By means of electricity ordnance can, if required, be fired without risk to the gunners; and the highest velocities of projectiles fired, whether the small bullet of the Martini or the huge projectile of the 100-ton gun, can be obtained with an exactness not before possible, and by the skilful use of mathematical analysis the results of experiments are reduced to exact and definite principles capable of application to practice.

The word "muschite" in ornithology denotes the male young of the sparrow hawk. Names of animals were generally bestowed upon ordnance, *erg.* the falcon and its diminutive the falconet, etc., and as the musket was the most important of small fire arms, it was probably thought worthy of being called after the smallest of the birds of prey. The term musquette was, however, applied on the continent to denote the iron part of the small arrows which were discharged from guns, and sometimes the arrows themselves. The first Spanish muskets had straight stocks, the French curved ones. Sir John Kellie, in his *Art Militaire*, published in 1621, says, "the barrel of a musket should be four feet in length, the bore capable of receiving bullets, twelve of which

should weigh a pound." The consequence was, that, owing to this great length and weight, they had to be supported by a rest when fired. The size of the musket gave it a much longer range than any other firearm, but the length of time it took to load—a quarter of an hour—and the weakness of the powder employed, it is not a matter of surprise that the use of the bow was preferred, and the adoption of firearms tardy. "The musketeer, besides his unwieldy weapon, carried his coarse powder for loading in a flask, his fine powder for priming in a touch-box, his bullets in a leathern bag, the strings of which he had to withdraw in order to get at them, whilst in his hand was his burning match and rest, and when he had discharged his piece he was comparatively defenceless if attacked." In fact it required a strong man to be a musketeer. Musketeers, according to Markham, were to have "good combe caps"—that is, iron helmets with a raised comb—"on their heads, bandoliers of broad leather across their shoulders, also swords, girdles, hangers or bauldricks, and bullet bags in which they shall carry their moulds, bullets, worms, screws, rammers and priming iron. Also they shall have good and sufficient muskets, of true size and bore, with clean barrels and straight scouring sticks, headed at one end with rammers of horn suitable to the bore of the piece, and at the other with boxes of iron into which to screw their worms, iron rammers and the like." Not only was the musketeer a heavily weighted man, but his energies, both mental and physical, were taxed by an amount of training to which the modern Manual and Firing exercises are a mere joke. Quoting from Markham again we learn that

"As touching the postures which belong to the musket they are forty in number, and they are to be done, five standing, three marching, eighteen charging, and fourteen discharging, but they are only for military instruction in the time of training and to make soldiers more excellent and perfect.

"Three postures, or words of command, are to be used in the face of the enemy; 1, make ready; 2, present; 3, give fire."

"The postures or words of command which are to be used in ordinary training or early exercising of the soldier are these, first five to be performed standing, that is to say:—Put on your arms, prepare your skirmish, rest your musket, your sentinel posture, your saluting posture."

"The postures to be performed in marching are:—Shoulder your musket, and carry your rest in your right hand, level your musket, slope your musket."

"The postures to be performed in charging are:—Clear your pan, prime your pan, shut your pan, cast off your loose corns, blow your pan, cast about your musket with both your hands, and trail your rest, open your charges, charge your musket with powder, draw out your scouring stick, shorten your stick, ram in your powder, draw out your stick, shorten your stick and put it up, bring your musket forward with your left hand, hold it up with your right hand and recover your rest."

"The postures which are to be performed in discharging are:—Carry your rest in your left hand preparing to give fire, slope your musket and let the rest sink, in the right hand poise your musket, in the left hand carry the musket with the rest, in the right hand take your match between the second finger and thumb, hold the match fast and blow it, cock your match, try your match, guard the pan and blow your match, open your pan, present your musket, give fire, dismount your musket and carry it with your rest, uncock your match and put it between your fingers."

In 1619 bullets were generally carried in a little bag called a purse, which was worn on the right side. When about to load, the fire-armed man withdrew a bullet and held it in "readiness in his mouth." This being his proper status, it was made a point of honour that troops who had capitulated should march out with the honours of war, viz., with lighted matches, bullet in mouth, drums beating, etc. It is stated that the conditions granted at the taking of Cambrai in 1595 were "that the soldiers of whatever nation might march out, their cornets and colours flying, matches lighted, and bullets in the mouth." On the 17th August, 1646, the Castle of Raglan surrendered to the forces sent by Oliver Cromwell, and according to the articles of surrender, the garrison marched out with their horses and arms, colours flying, drums beating, trumpets sounding, matches lighted, bullets in their mouths, and twelve charges of powder.

(To be Continued.)

The Winnipeg Association Football Club have presented a warmly worded address of condolence to the parents of Corporal Code, who was a popular member of the club, and who died of wounds received at Fish Creek.

The officers of "B" Battery have finished their audit of the books of Pay-Sergeant Stewart and find that his defalcations amount to over \$2,000. This loss the officers who certified to the correctness of the accounts, will have to stand. The sergeants' mess and other regimental organizations will be out considerably. The total misappropriation is about \$3,000.