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## The Volunteer Review,

RAND

### MILITARY AND NAVAL GAZETTE.

Unbribed, unbought, our swords we draw,  
To guard the Monarch, fence the Law "

OTTAWA, MONDAY, SEPTEMBER 30, 1872.

LIEUT.-COLONEL WAINWRIGHT GRIFFITHS, at present on a tour through British Columbia, has kindly consented to act as the Agent for the VOLUNTEER REVIEW in that Province.

TO CORRESPONDENTS.—Letters addressed to either the Editor or Publisher, as well as Communications intended for publication, must, invariably, be *pre paid*. Correspondents will also bear in mind that one end of the envelope should be left open, and in the corner the words "Printer's copy" written, and a two or five cent stamp (according to the weight of the communication) placed thereon will pay the postage.

As stated in a previous article the largest cast iron smooth bored gun in the British Service was the 68 pounder of 112 cwt., according to the new system an 11 inch gun. The descriptions of all Ordnance under the old regime was Guns, Mortars, Howitzers—Caronades are obsolete—in service the range only fitted them for close quarters, and from their shortness they were looked on as a handy gun in the Navy.

There were two kinds of smooth bored guns used—the solid shot gun and the shell gun—the latter from which no shot can be fired was generally designated by the calibre and weight of metal, as the 10-inch cast-iron gun of 87 cwt.

The different *natures* of cast-iron shot guns were 6, 9, 12, 18, 24, 32, 42 and 68-pounders of the latter there were two varieties, one for land service of 112 cwt., the other for sea service of 95 cwt. There are two varieties of 42-pounders, one being 84 cwt., the other 67 cwt. and no less than *eleven* varieties of 32-pounders weighing from 58 cwt. to 42 cwt. There are four different kinds of 24-pounders, four of 18-pounders, two of 12-pounders, and two of 9 pounders.

The cast iron shell guns were merely long howitzers, they were introduced in 1824, they are two *natures*, the 10 inch noticed before and the 8-inch of 54 cwt.

Since 1816 British artillery appears to have been in a transitional state, subject to constant change and a good deal of empirical experimentation.

The immense impetus given to the development of *metallurgy* by the expansion and success of the Railway system supplied the necessary mechanical skill for making accurate experiments as to the capacity of cast and malleable iron and steel, and brought into this speciality an amount of scientific skill which could not be supplied by the professional artillerist. The great changes in the arm were effected by civilians Armstrong, Whitworth and Moncrieff.

There are four *natures* of bronze guns in the service 3, 6, 9 and 12 pounders, they are altogether field artillery, and in battery, are associated with bronze howitzers of nearly equal weights, as follows: four guns to two howitzers.

12-pdr. Battery.	32 pdr. Howitzer of 17 cwt.
9 " "	24 " " 13 "
6 " "	12 " " 6 "
3 " "	43 inch " 2½ "

for mountain service.

Mortars are short pieces of ordnance used to throw shells at high angles generally 45°, the charge varying with the range; they are distinguished by the diameter of their bores, are made of cast iron or bronze, the former being used for garrison battering trains and the naval service, the latter which are light are chiefly employed in sieges.

The cast iron mortars for land service are
13-inch of 36 cwt.
10 " 18 "
8 " 9 "

And for sea service—13-inch of 100 cwt. of which there are two patterns, and 10-inch of 52 cwt.

The bronze mortars are—
5½ inch Royal of 1½ cwt.
4.25" Cohorn ½ "

Howitzers were originally introduced for the purpose of firing shells at low angles, and their advent in naval operations rang the knell of the *wooden walls* of England, the *shell* guns being an improvement in accuracy and range has to a considerable extent, if not entirely superceded them. There are two *natures* of cast-iron howitzers, 10 inch of 42 cwt. and 8 inch of 22 cwt.

Caronades were introduced by the direc-

tors of the Carron foundry in Scotland in 1779, they were peculiarly a ship gun, and were adopted because they were shorter, lighter, and more easily handled than guns of the same calibre, having less *windage* their range from 400 to 600 yards was more accurate, and they were *bell muzzled* (wider in the bore at the mouth) to facilitate loading, and to enable the burning wads to pass out easily, thus saving rigging and hammock nettles; they had no *trunnions*, but were cast with a loop underneath through which a bolt passed attaching the gun to its carriage; they had a *sight* on the reinforce ring, their chambers cylindrical, the charge being one-twelfth the shots weight.

They were constructed of all calibres from the 6 to the 68-pounder, four *natures* are retained in the service, 24, 32, 42 and 68-pdrs., they are very unsteady in recoil owing to the lightness of the metal, are liable to kick over smashing breeching, tackle and bolts when heated from firing.

As the ignition of the charge takes place at or near the end of the chamber or bottom of the bore, it is evident that the greatest strain has to be borne at that point because of the sudden development of the latent force of the gunpowder, and this consideration determines primarily the length of the bore—the only variation being in the quality of powder used—the object to be attained is that the whole should become ignited before the projectile left the muzzle of the gun, or at the same instant.

Experimentally it has been found that maximum ranges have been attained from smooth bore artillery by making the length of the bore to range from 12 to 19 calibres; the proper length for the bores of rifled ordnance has not yet been determined.

The calibre itself as well as the amount of windage was originally determined by the diameter of the shot which was divided into twenty parts, one additional being allowed for windage, thus making the bore 21/20 of the diameter of the shot.

Modern experience has established the windage of smooth bore field guns at 1/10 of an inch—cast iron guns 125 to 233 of an inch—iron 10 and 13 inch mortars 1/16 of an inch, and the brass mortars have 1/25 for the Coel. orn, and 1/66 for the Royal. Muzzle loading rifled guns have a windage of 1/8 of an inch which has been lately considerably reduced.

In all S. B. mortars, howitzers and shell guns which have comparatively small charges there are chambers for the purpose of producing the greatest useful effect; they are of two kinds, cylindrical or conical, the former being best adapted to small and the latter to large charges. This device to some extent obviates the evils of windage as it enables the explosive force to be concentrated on the axis of the projectile.

Cast iron as is well known has less relative tenacity than wrought-iron; the latter, good scrap iron, will bear a strain of 53,400 lbs. to