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The Volunteer Review,

AND

MILITARY AND NAVAL GAZETTE

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

OTTAWA, TUESDAY, DEC. 15, 1874.

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 at 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.

LEUT. J. B. VINTER, of Victoria, is our authorised Agent for Vancouver Island, British Columbia. As is also Captain H. V. EDMONDS for New Westminster and adjacent country.

Broad Arrow of 31st October, has an article (which will be found in another column of this issue) on "The Effects of Ice and Snow on Artillery and Rifle Fire," which is of considerable interest in this country where a winter campaign, if it could be undertaken at all, must be carried out under conditions which would make it a matter of first importance to know what precise effect artillery and rifle fire would produce on ice and snow built batteries or gun pits. The experiments carried out in Austria will not materially help us to a correct idea of what effect would be produced on ice 32

inches thick, which is frequently its depth in our rivers and there is nothing to prevent its production by the simple operation of pouring water on snow to a depth of five or ten feet if necessary, and we very much doubt the effect of shell fire on a mass of say five feet of solid ice backed by well rammed snow to penetrate beyond six inches or to produce any material effect on a battery faced with that material.

Taking the angle of the greatest elevation of Field Artillery for useful effect as fifteen degrees and the angle of incidence as equal thereto, the slope of a battery wall need not be at a greater angle to cause every shot to ricochet, for it must be remembered that the impact instead of disintegrating the particles of ice merely compresses them and therefore increases resistance; this fact accounts for the small effect produced by shell fire on ice during the Austrian experiments detailed by *Broad Arrow*. A flatter trajectory than that produced by an angle of fifteen degrees would produce even less effect and there would be no way of rendering a properly constructed ice battery untenable except by vertical fire—the question of the effect produced by ordinary rifle fire need not be gone into, the experiments are conclusive on that point. If our Canadian Artillery were properly organized there were open to them a series of most interesting as well as profitable experiments, and they are in a position, owing to peculiarities of climate, to carry them out better than any other people. It is recorded that at the battle of Austerlitz, fought 2nd December, 1808, NAPOLEON LE GRAND directed a heavy artillery fire on a lake over which a division of Russian troops were retreating on the ice, with the effect of breaking up the latter and drowning some 4,000 men; the ice to answer the conditions must have been only six inches or less in thickness, as at eight inches it will carry the heaviest field artillery, while the effect of the fire must be aided considerably by the vibration caused by the hurried passage of such a large body of men. The experiments as far as tried are most interesting and could be turned to good account.

The following article from the *Mitrailleuse* is taken from the United States *Army and Navy Journal* of 21st November, although by no means believers in the value of the weapon as a field gun, we are well aware that it has its own proper place in defensive warfare and therefore our readers are treated to all knowledge within reach on the subject, on the same principle with which the *torpedo* question is dealt with.

"There are many good writers who do not possess the faculty of analysis and comparison of inventions, machines and mechanical processes, and of defining the exact scope and limit of inventions. All such authors in writing about the Gatling gun are liable to classify it with other machine guns when, in truth, it differs in all its distinctive features

—in mechanical construction and operation—from all other firearms. In other words, the Gatling gun is an original invention, and forms a system of its own differing radically from all other arms as does the Colt pistol from a flint lock musket.

"Captain T. F. Owen, R.A., of the British army, has recently published a treatise entitled "Mitrailleurs, or Machine Guns," in which the history and peculiarity of all kinds of machine guns are treated at length. The author very justly holds that the Gatling gun possesses in the highest degree the various desiderata required by a machine gun; but, he has unwittingly fallen into the error of describing all machine guns as belonging to one and the same class of firearms. It is clearly a great mistake to class the Gatling gun—which loads automatically and fires continuously 400 shots per minute, and which uses metallic cartridges that are of modern origin—with ancient machine guns (orgues, orgels, etc.) formed of many barrels, and which were loaded by hand with loose powder and balls, and fired in a volley by means of trains of powder set off by a match similar to the way gun barrels are now proved in armories.

"In regard to the inventions which preceded the Gatling gun, Captain Owen says:—

"On the introduction of rifled field guns, it appeared that the rotary motion imparted to the projectile somewhat decreased the effect of case shot; while shell fire (until fuzes are much improved) must always be more or less uncertain. Mitrailleurs were therefore made, with a view to their affording a fire like that of case (mitraille), or a hail of bullets, for ranges up to 1,000 or 1,200 yards. This term, of French origin, has been found inconvenient to the Anglo-Saxon tongue and consequently has not been adopted by the Americans or ourselves for the machine guns which we use. We designate them by the name of the inventor, and call them "guns." We must not imagine that guns with many barrels were not used before the Franco-German war of 1870-1.

"Firearms having many barrels, intended either to be fired together or in rapid succession, are by no means a modern conception; although the introduction of rifling and metallic cartridges has of course revolutionized their nature and manufacture. In the earliest days of artillery, we find machines used under the names of ribaudquins, orgues, orgels, organ or tube guns, etc., in which several barrels of small calibre were united in a single mass, or on a rigid frame-work. For the protection of fortresses, such guns were employed in Flanders in 1347; four breech-loading tubes of small calibre being placed on a two-wheeled cart, with their muzzles protruding through a wooden screen, protected by a chevaux-de-frise. Andrea Cattaro mentions a machine used in Italy in the 14th century (against the people of Carrara), which consisted of a carriage having 144 small bombardiers (bombardelles) ranged in rows of twelve, three of which rows could be fired at once, and so thirty-six balls (about one size of an egg) discharged at a time. The carriage was drawn by four horses, and three men were sufficient for loading and firing the 144 bombardelles. At the battle of Tongres, again, in the year 1408, a number of ribaudquins, or tube guns, were used, but apparently with little effect; and three years later we find that the Duke of Burgundy's army of 40,000 men and 2,000 organ guns, besides cannon.

These weapons were originally of clumsy construction, and could not be discharged