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Sergeant James McIntyre (Provisionally vice O'Neill promoted.

To be Ensign

Segeant James Jack, (formerly of Her Majesty's 17th Regiment) vice Thomas Yates left limits.

Robert Weafer, gentleman, (provisionally) vice Wilson promoted.

By Command of His Excellency the Governor General.

WALKER E. POWELL, Lieut. Col.
Acting Adjt. General of Militia.
Canada.

## COMPETITIVE TRIALS OF HEAVY ORDNANCES.

(*From the New York Herald*)

Boston, Dec. 1, 1873.—"In time of peace prepare for war." This is a trite saying, but the events of the last few weeks have demonstrated that it is a maxim which the United States, as well as other nations, should observe most attentively. Happily, perhaps, the prospects and dangers of a Spanish war are for the moment posponed on account of intervening diplomacy, but the suddenness with which hostilities were seriously threatened only a few days ago, should be a warning which the government should profit by. Improvements and experiments in heavy ordnance were conceived more than a year ago by the proper governmental authorities, and Congress made necessary preliminary appropriations for the experiments.

Competitive trials of heavy ordances and tests took place upon the obscure territory of Nut Island, in Boston Harbor In brief, it may be stated that the experiments were such as to demonstrate that all the smoothbore guns on hand and belonging to the government can be increased in precision and power to an extent which will enable them to hit and destroy, with a single shot, any iron clad or other war vessel that ever floated. The experiments took place under the observation of Capt. Truxton, Captain of Ordnance of the Navy Department, and under the supervision of Norman Wiard, agent of the department and inventor of the rifling improvment, which adds such remarkable force and efficiency to the heavy armament of our forts and ships-of-war. For the purposes of the experimental test there were provided two guns of 23 tons each and of 16 inch calibre. One of them was the common smoothbore, and the other was rifled in accordance with Mr. Wiard's invention, but in other respects there was no difference whatever. One houndred and forty pounds of powder —the largest quantity of ammunition ever used in a gun—was fired from each, and the projectiles were respectively of 460 pounds weight. The targets consisted of wrought iron plates of 15 inches in thickness, and they were erected side by side, 150 feet distant. The rifled projectile fired from the Wiard gun was of conical shape, the one fired from the common smoothbore piece was necessarily round. The one first named went clear through the fifteen inch plates, and out of sight into a sand bank in the rear. The demolition of the almost invulnerable target was complete, and so great was the force with which it was struck that a fragment of 300 or 400 pounds was thrown clear across the island, a distance of not less than a quarter of a mile. The projectile from the smooth bore gun penetrated the target only about six and a half inches, and as the advantages were precisely equal, the superiority of the rifled arm was at once established by the experiment, and admitted by the Government authorities of observation. Compared with other comparative tests, this style of gun is the most destructive ever yet produced. A 35 ton gun of 12-inch calibre was once fired in England through an iron plate of 12 inches in thickness, showing the comparative penetrating power of that arm to be about 144 against 226 of the gun at Nut Island. This improvement, as the Government understands it, does not involve the manufacture of new guns to secure it. Take the present armament of our forts, just as they are, and they can be rifled at one-tenth the coast that new guns can be manufactured, and at the same time their efficiency as smooth bore ordnance is not in the least impared; and including the cost of rifling, the arms will be cheaper by one-tenth than the best English guns, and for destructive powers their efficiency can hardly ever be equalled.

Under the improvement it is claimed that the rifled guns belonging to the United States Government may be made to have greatly increased efficiency, endurance, penetration of iron plates, higher initial velocity to the shot, much longer range and improved precision; while the guns of the smooth bore will remain as essentailly as good or be better smooth bore gun than they now are, and, if rifled, they may be, after, the improvment is applied, used effectively as smooth bore guns if desired. By this means all the spherical projectiles now on hands may by utilized, and all carriages, implements, platforms, ordnance stores and service of the gun may be made available. The improvement consists in rifling each gun with two grooves, having for a 16-inch gun a twist of about one full turn in 50 feet and so stationing the grooves at the side of the bore that neither groove will intersect, or cross the bottom or top of the bore, thus leaving it smooth at the bottom and top where the shot will strike in "ballotting," should the gun be used as a smooth bore for spherical projectiles after being rifled. After the gun is rifled, however, it is proposed to improve the spherical projectiles now on hand by drilling three small holes in each, a little distance from the point of contact the shot or shell would have with the bore of the gun when inserted as if for firing. The holes to be equi-distant from each other in the form of a regular triangle. Into these holes insert three brass pins, each to be cut, after the insertion of such, the exact length necessary to support the projectile up and out of contact with the bottom of the bore, so that the windage shall be equal all round. By supporting the projectile in the centre of the bore previous to its receiving its impulse from the powder the windage all round alike, an achievement is arrived at by most simple means, often attempted in this country and Europe without success.

Great interest in the experiments. Notwithstanding, the Spanish war cloud has blown over, the experiments, with the guns described are still regarded with great interest by the government, and especially by the Navy Dapartment. Other tests are to be made in a few days with a view to obtaining an idea of the comparative distance and rapidity with which a projectile can be thrown from a rifled and a smoothbored gun.

Our Naval Bureau of Ordnance has just issued a translation from the French, of a description of the Reffye gun, adopted by the French Government after an extended series of trials at Calais and Bourges, in competition with the Woolwich, Vavasseur and Krupp systems. It is of interest to the Navy, says the preface, "as the Bureau purposes introducing a bronze breech-loading 3 inch rifled howitzer, using a metallic cartridge case. Several important modifications have been made in the details of the screw breach, by increasing the length of the screw, adopting a better form of thread, and the insertion of a steel thimble, containing the screw-box, in the rear of the gun. Also, by diminishing the excessive twist, and substituting two lesdon rings (one in front to guide, the rear one to take the grooves and close off the windage), for the leaden jackets of the projectile."

The gun introduced into the French service is a bronze breech-loading field piece of the calibre 7. It will throw a shell weighing seven kilogrammes 5,000 metres. It combines the lightness and facility of manipulation of a field piece, with the accuracy and range of siege artillery of medium calibre. Although bronze has been chosen as the regulation material, as a metal more easily worked, than steel, the manufacturers who prefer steel have been allowed to use it, and several guns of this metal have been produced at Rive de Gier on the plans of M. de Reffye. The standard for the bronze is 100 parts of copper to 11 of tin. The new gun has the advantage over the old calibre 12 gun of a flatter trajectory—the angle of fall in the former, at short range, being but 9 deg., and in the latter 17 deg. 2 min. This result is due (1) to the supression of windage; (2) the complete and constant grip of the projectile; (3) the elongation of the charge; and as a sequence, loading at the breech, and enclosing the charge in a metallic case. The rifling is the polygroove, having a twist of one turn in one metre 85 cen. When any defect is shown in the bronze at the proof firing, a tube, cold drawn, of hammer hardened yellow brass, is inserted in the bore, the breech of the gun being first heated so as to grasp the tube tigetly as it shrinks in cooling. The breech is closed by a slotted screw a method known as the French closure—*fermeture Francaise*—which the translator of this description of the Reffye gun shows in an American device, and was first applied to a 12 pounder gun at the Washington Navy-yard in 1851. In its first conception it was however too imherfect to be used, and it owes its successful development to the preserving efforts of the French. For fuller description of the gun, and of its ammunition and projectiles, we refer our artillery readers to the ordnance pamphlet.

The Ordnance Department are busied, among other things, in changing the 15-inch carriages from the old pattern to the new. The Engineers are at work putting our forts in defensive order. Lieutenant General Sheridan has been called to Washington in consultation in regard to Cuban affairs. All these signs are warlike; but the latest news, at the time we go to press, is to the effort that Spain has decided to yield to the demands of our Government, and it is to restore the *Virginius*. What reparation is to be made for the slaughter of her crew is not stated, nor what guarantee that the orders of the home Government will be carried out in Cuba.—U. S. *Army and Navy Journal*, 29th Nov.