

MITRAILLEURS IN FORTRESSES.

A well known and somewhat eccentric writer of the present day, declaiming in picturesque language against modern war, describes it as scientific war—chemical and mechanical war—war in which masses of men are taken away from all industrial employments, and provided with destructive machines, varied daily in national rivalry of inventive cost. Such war, he declares, is worse than the poisoned arrow of the savage, but he ends by acknowledging sadly that the progress of science cannot, perhaps, be otherwise registered than by new facilities of destruction.

We might join issue with him upon the comparison between war of ancient and modern times, and certainly cannot agree in his wish that our science might be extinguished in darkness, and a return made to the single combat or hand to hand struggle of the German era. On the contrary, we hold that throughout all ages war has been cruel, and that the facilities of destruction we now possess do not tend to aggravate its horrors, nor to make the modern soldier less brave and chivalrous than those who have fought and died in other ages, slaughtered with more simple weapons.

The progress in science must be accompanied by progressive improvements in facilities for destruction is, however, perfectly clear, as we have daily proof of it before our eyes. Even electricity, first used to carry messages of peace, is now being pressed into the service of Mars; while the very elements are caused to aid red handed war. We impregnate earth with nitro glycerine, call it dynamite, and immediately prepare to blow up our enemy's ships by means of the same. Water we fill our shells with, so that they may more surely burst into many fragments, and we are now trying to make the very air itself take up our scouts for reconnoitring the foe in M. Menier's captive balloon.

Amongst the latest and most deadly of the facilities for destruction that progress in mechanical science has furnished us with, we may reckon the mitrailleuse, the tactical employment of which weapon in the field we discussed at some length in June last. Since the date of that article no improvements worth mention appear to have been made in its mechanism or ammunition, though recent trials at Shoeburyness of the heavier nature of the Gatling gun confirm the views we formerly expressed that our military authorities are quite alive to the value of the mitrailleuse for service in fortresses as well as in the field.

Additions, however, have been made since June to the literature of mitrailleuses which aid us to arrive at more distinct conclusions as to their uses. We allude, in particular, to a small work on machine guns or mitrailleuses by Captain Osen, of the Royal Artillery, ("Machine guns or Mitrailleuses.") in which the first conception of this firearm, its gradual improvement and present tactical use are fully entered into, and also to a short paper on the employment of mitrailleuses for flank defence which appeared in a late number of one of our periodicals. It seems to us that neither of the writers in question have sufficiently pointed out the many important advantages of mitrailleuses for fortress purposes. The economy which would result from the employment of these weapons is very great, and for defending a breach or clearing a ditch of the attacking force they would be invaluable.

Our shrewd cousins across the Atlantic do not spend more money upon their military personnel and matériel than they can possibly avoid, and adhere to cast iron smooth bore guns for economy's sake, even the details at the famous Academy of West Point learning gunnery with pieces which would scarcely hit a haystack were it a mile away. But we see from the report on mitrailleuses presented to Congress by the Secretary of State for War, that nearly three hundred thousand dollars have been appropriated to the purchase of Gatling guns for service in various forts. These Gatlings were to be in position by the end of July in the current year, and their purchase and speedy adoption, as a portion of their garrison armament, show in what high estimation Americans hold them.

The Board of United States officers upon whose report this appropriation was made remark that for flank as well as direct fire in field works, the efficiency of the Gatling is questionable, and in this opinion we find that all who have examined the question seem to concur.

As reasons for adopting mitrailleuses as auxiliaries in flank defence of permanent works, where the flanking fire extends over distances greater than 200 or 300 yards, the Board point out that unless the number of the short howitzers generally used give a rapidity of fire approaching continuity, the combination of the two seems to be superior to either singly, the fire of the Gatling filling up the intervals between the volleys of the howitzer firing canister.

A second Board of Engineer officers drew attention to the case of a simultaneous attack on the curtain and faces of an adjacent bastion, and recommended the supply of one Gatling for each flank of casemated forts, even to the displacement of a howitzer, if the scarp could be readily approached.

In the case of such a simultaneous attack, it would be impossible, they say, to serve the opposite howitzers with the freedom that a good defence would require, from the risk to gunners in the opposite casemates, but the Gatling could be used with entire freedom to flank the bastion and curtains also if directed above or below the opposite embrasure. This, of course, would not apply to counterscarp casemates.

In the exhaustive trials on which these reports were partly based, and which took place at Fort Monroe, the mitrailleuse was pitted against the 12 pounder field gun (bronze Napoleon), a 4½ inch rifle and 8 inch siege howitzer, using case, canister, and shrapnel, and also a detachment of forty men armed with the Springfield rifle. Canvas targets, 9ft. by 46ft., were used, and the contrast in the number of hits was marvellous. In one minute and a half, at 500 yards' range, the Gatling gave 557 hits against 154 of the field gun and 112 of the howitzer; and at 800 yards, 534 hits against 35 and 0 respectively; spherical, case, and musket balls were employed with the gun and howitzer in the case quoted.

The Americans seem to have an exceptionally good ammunition in the new metallic cartridges they have adopted for the arm, for in October, 1873, experiments were made with it to test the power and endurance of the Gatling gun. On the 23rd of that month 30,000 rounds were fired from a single Gatling, and on the 24th 64,000 more from the same gun. No injury was caused to the barrels by this severe proof, nor was any difficulty experienced in extracting the empty cases, though the ra-

pidity of fire was sometimes as great as 400 per minute.

It is stated that after 4000 to 5000 rounds had been fired the fouling did not increase a fact which might, perhaps, have been due to the heating of the barrels.

The data obtained during our trials at Shoeburyness are not less conclusive as to the tremendous comparative effects of the fire from the Gatlings at ranges not exceeding 1400 yards. It is hardly within the scope of a short article to enter into these data, but we trust we have said sufficient to show how important is the question of employing mitrailleuses as an auxiliary arm for the defence of fortresses under certain conditions.

What these conditions are it is for our artillery and engineer authorities to judge, and we may safely leave the solution of the problem in their hands, for they at least have no compunction as to utilizing whatever facilities for destruction modern science may furnish us with,

A interesting experiment, says *Nature*, was recently made, by M. M. Bertrand and Mortillet, directors of the St. Germain Museum in the Camp de Manœuvre. The war implements constructed from designs of Trajan's Column were tested, when it was found that the catapult threw arrows a distance of 300 yards. The mark was hit regularly each time up to 180 yards. The same can be said of the *onager*, which sends stones to a distance of 180 yards with astonishing precision, although weighing 1½ lb. The initial velocity was calculated to be more than fifty metres per second, as the time taken to reach the mark is not more than seven seconds, and sometimes less than five. All these apparatus are to be tried at public exhibition to be given in the beginning of next October. We may add that elaborate descriptions of the catapult, ballista, etc. may be found in "Rollin's Art of War." From experiments which we have ourselves carried out it would appear that the catapult was a powerful engine of destruction superior in many respects to the earlier cannon.

The *Melbourne Argus* had the following among its news from the South Sea Islands:—"On the 50th of April, Captain McKensie observed what he believed was a submarine volcano in state of activity. When about midway between Heabai and Tonga, two of the Society Islands, about twelve miles from land, he observed a large column of water shot up fully 100 ft. into the air. There was a dense cloud of what appeared to be steam rising from the ejected water. Captain McKensie was afraid to go sufficiently near to ascertain whether it was warm water that was ejected, but upon this point there can be little doubt. The spot where he saw the water sent up is marked on the chart as a shoal, and so long as he was in sight the water continued to be sent upwards with equal force.

From information which has been received at the School of Military Engineering, it appears that those engaged under the North American Boundary Commission who proceeded from the school are getting on most satisfactorily with their task. They had reached about 750 miles beyond the Red River, and are now on their way back to Halifax to go into quarters for the winter. The work is expected to be finished in 1875.

A despatch from Shanghai reports that the troubles between China and Japan in regard to Formosa have been settled.