need. It was difficult to lay down any form from which there should be no deviation, but one thing was a necessity arising out of the fearful intensity of modern fire, i. e., that when once close ranges were reached men must advance firing or suffer enormous losses. Another result of the increased employment of fire in modern warfare was the greatly enhanced value of artificial cover, and on the Continent a provision was made for the carriage of entrenching tools by the soldiers. He would suggest that our infantry should also carry a small pointed spade in the bayonet frog behind the bayonet, and that the pattern proposed by Lord Elcho (combining a chopper and a saw) should be substituted for the present form. With the exception of the Boxer cartridge, the Martini-Henry was, he delivered, the best infantry weapon introduced into any army, but the rifle of the future would be, in his opinion, of about 0.38 in. bore, and to fire a bullet weighing 80 grains, with a charge of 100 grains of powder. Such a weapon would be as accurate as the Martini at long ranges and having a muzzle velocity of 1600 ft., would give a much flatter trajectory at short distances, and another gain would be found in the diminished weight of the cartridges. Still, in the future, repeating rifles would be found to possess overwhelming advantages, for by it, sudden shower of bullets could be poured in at the critical moment of an action, when increased intensity of fire was often decisive. In addition to improved armament, further and more systematic training of our soldiers, especially when formed in such units as companies, squadrons, and batteries was essential. With regard to the artillery portion of the question, the lessons of the last wars had shown the necessity of concentration of fire, the desirability of increasing the man-killing power of the projectiles in order to cope more effectually with rifle fire, and the inefficiency of small common shells against earthworks. With regard to the power of artillery, he feared that we were now behind the other great Powers, although we should, no doubt, overtake them in course of time, and whatever conclusions might be arrived at under this head it was evident that the first steps would have to be the alteration of our common shell, which broke up into so many fewer fragments in comparison with those of other countries. In the conclusion of his paper the lecturer dealt with the armament of cavalry and of engineers, and offered some suggestions with regard to these branches of the Service.—*Broad Arrow.*

—Sir Garnet Wolseley spoke sensibly as well as eloquently at the dinner of the Newspaper Press Fund on the necessity of army reforms, appealing to the press to support him in "removing from the path of progress those great boulders of prejudice and superstition which now impede the way." As there is a disposition in some quarters to take for granted that no officer of experience can possibly have a good word to say for Lord Cardwell's reforms, and that the defence of them must be left to civilian doctrinaires, Sir Garnet Wolsely's words are worth nothing. He has no sympathy with those who think that to reform we must go back and not go forward, and whose ideal is "the army before the outbreak of the Crimean war." "The time has gone by for an officer to be considered a good soldier because he is a good drill, and able to carry on the ordinary routine of the parade ground and the barrack. To be worthy now to command men can only be attained by study of military science and of the military history of past ages, so as to draw lessons for guidance in the future. I am glad to know that a large portion of our young officers are really efficient in this sense, and able to compare favorably with the officers of any nation in the world. I can gratefully testify to the difference of the state of things now existing in that respect as compared with the the time when I entered the service." This ought to silence those partizans who, for political reasons, feel bound to insist that Lord Cardwell ruined the service, for without Lord Cardwell's reforms the change would have been impossible.—*Pall Mall Gazette.*

—Recent experiments made at Sir W. Armstrong's proof grounds, near Newcastle-on-Tyne, gave unexpected results—at all events to the general body of the public. Unless we are much mistaken these latest productions of Elswick will have a potent influence in moulding the decision of any committee which may be appointed according to the promise of the Government. It should be premised that the smallest armour-piercing gun in the Navy is the 7-inch, weighing 6½ tons. This gun is capable of penetrating seven inches of armour at a range of 1000 yards. The projectile weighs 115 lbs., and its muzzle velocity 1525 feet per second. After this comes the 95 cwt. gun—firing a projectile of 64 lbs—which, only at close distance, is capable of penetrating a 4-inch armor-plate. Such feeble powers scarcely qualify it to be classed with armor-piercers. With the performance of the Service 6½-ton 7-inch muzzle-loading gun, let us compare that of Sir W. Armstrong's 6-inch breech-loading gun, discharging *a steel projectile of* 80 *lbs. Fired with a charge of* 37½ *lbs of powder a muzzle velocity of* 2058 *feet per second was given to the projectile, which penetrated a plate* 12 *inches thick, so that the shot was nearly* 12¼ *in. distant from the front of the plate.* Several other rounds were fired with varying quantities of powder against a plate of the same thickness, and in each case the projectile went nearly through. A steel shell of 100lbs. weight fired with 21¼lbs of powder against an 8-inch plate went through the latter to a distance of more than six inches from the rear. Also a shell of 80lbs. was driven by a charge of 31lbs. of powder through a 10-inch plate to a distance of 8½in. beyond its rear.

Other rounds with smaller charges were fired with surprising effect, notably that of an 80lb. steel shell being propelled by only 17½lbs of powder, and sent clean through a 6-inch plate, the base of the shell being picked up behind the target.

Such are some of the remarkable results obtaided at this recent series of experiments. They show that Sir W. Armstrong's 6 inch breechloader has a half-greater armour piercing power than the Frazer 7 inch muzzle-loader, the latter being more than fifty per cent heavier. This comparatively little gun of four tons weight is thus a piercer of 11-inch armour.—*Broad Arrow.*

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