THE RIFLING OF THE NEW MILITARY BREECHLOADER.

In our last issue we called the attention of our readers to the sights of the new military breechloader, in the hope that this important part of the rifle might not be lost sight of by the Breechloading Committee; and we now propose to say a few words upon the rifling of the new arm. The subjects stand in a very different position, as the Committee have received a large amount of evidence upon the latter important matter from the most experienced rifle-makers in the kingdom. It is true there is a great difference of opinion amongst them, so great indeed, as in many instances to be totally irreconcilable, and this no doubt is to be accounted for, when the opinions of different inventors are placed in juxtaposition. We think, then, it may not be without use to endeavour to arrive at the result to be gathered from the weight of evidence before the Committee, strengthened, as it cannot fail to be, by the practical evidence of the match-shooting for the last three years; for, taking our point of departure, as it were, from the year 1865, it is impossible not to see the stride opinion has taken in this matter, and how much may now be said to be ascertained for all useful and practical purposes. The attention with which the Volunteer movement invested the rifle had, about four years ago, developed three systems of rifling that stood prominently before the public. The first was known as the groove system, of which the Enfield in England and the Springfield in America were the types. This system was simply a cylindrical barrel, with three or more shallow grooves, with more or less broadish lands, and with an even and by no means sharp twist. The second was known as the elliptical, of which the type gun was the Lancaster. This system was relied on to give the spin to the projectile by its oval-shaped barrel—for the rifling so faded away that the barrel was almost a smooth-bore. And thirdly, the polygonal system, of which Mr. Whitworth's was the type, hexagonal in form, with deep grooves, and a very sharp spiral twist, and almost of necessity requiring a mechanically-fitting projectile. Now, as we often remarked at the time, it was impossible that rifles made upon three such different principles could all of them be rightly constructed—it was certain that one system must be the best. Still, the actual shooting and the different trials to which the rifles of the different systems were exposed all gave such excellent results that there was extreme difficulty in arriving at a correct conclusion between them. We were always strong advocates of the first, or groove system, for we could not believe that a rifle that could shoot so truly as the Enfield was proved to do up to 600 yards, that could stand the stress of all weather and the rough usage it received, that fouled so little and that shot so safely, could be constructed on principles that were wide of the truth. Still, in the face of these strong facts, committees expressly appointed to inquire into the trials of the different systems again and again reported in favour of the elliptical, or Lancaster system, while the polygonal, or Whitworth, found so mush favour with riflemen in general that upon the recommendation of its public shooting, a large number were actully made and issued to the Army, and it seemed at one time likely that it would supersede the Enfield as the national arm. It was in vain we pointed out in these pages that its liability to foul, its heavy charge, its recoil, the exeeding delicacy of manipulation required for its every day use, its mechanically-fitting bullet, and its heavy expense, totally unfitted it for a military weapon, and we doubted whether any rifle constructed upon this system could ever be more than a target arm. It is not too much to say that the result of the past three years' experience has proved the correctness of these views, for while the elliptical and polygonal systems have almost become things of the past, both theory and practice have at last combined to establish the superiority of the groove system; and it may be taken as a conceded fact by riflemen that a hollow cylinder with shallow spiral grooves is the true form of rifling, by which a properly-constructed projectile can be driven through the air both further in distance and with greater accuracy than from a barrel constructed in any other manner. And it is no small credit to the gentlemen who acted upon Lord Hardinge's commission, and as far back as 1852, that they were so right in their conclusions, and secured the Enfield as the national weapon; while some degree of shame must attach to those who so persistently reviled it, and stigmatized it as the old gaspipe, that would scarcely hit a haystack at 1,000 yards.

That the triumph of this principle has been demonstrated is mainly due to Mr. Metford, whose rifle, constructed on the groove system, has produced greater results than any other rifle at present in the field. It is true the Rigby is held in as great, or almost as great, favour as the Metford with small bore men: but in all fairness to both we cannot regard the Rigby but as an imitation of the Metford in all its main features, shooting also a hardened expanding bullet, so closely a copy of Mr. Metford's original bullet that in its true character it is the same; and, indeed, we believe Mr. Rigby, who long held to the polygonal or Whitworth system, was converted to the groove by the performance of the Metford when, in the hands of Colonel (now Sir Henry) Halford, it won the Cambridge Cup at Cambridge in the year 1866. It is needless to say, then, that the Rigby is also a rifle on the groove system, and the only difference between it and the Metford is that the latter has a gain from end to end, while the former is uniform throughout. It is probable that this last small point of difference (for the shooting of the two rifles in all the great recent matches shows how small a difference this single point makes), will have to be decided by the Committee; but it should be borne in mind that if the shooting of both may be said at the 1,000 yards to give pretty equal results, the Metford, in the shooting for the Cambridge Cup this year at 1,100, exhibited a marked superiority, throwing the whole of the fifteen shots fired at this range within a vertical of four feet and a half, a shooting up, as it is termed, that is, we believe, without a parallel in the history of the rifle.

It is true the great power of these rifles and the truth of the groove system have only hitherto been tested in practice by the muzzle-loader, but we have no doubt that what is shown to be the best form of rifling the barrel with that description of weapon, will be equally proved to be the best with the breechloader. To sum up, we believe that the rifling of the barrel of the future will be upon the groove system, with shallow grooves, the number being not material, probably something not above five or six, and with a spiral twist, whether gaining or uniform (and the uniform has the able advocacy of Colonel Boucher), as the Committee shall decide; and in either case the credit that will attach to it should properly and fairly rest with Mr. Metford.—*Volunteer Service Gazette* (England).

MISCELLANEOUS.

THE ITALIAN CAMPAIGN OF 1866.—The controversy between the Generals respecting the Italian campaign which ended in the disaster of Custozza still continues. General La Marmora has published a dispatch which is calculated to unravel some of the suspicion attaching to him that he was playing into the hands of France. This document is a letter addressed by him to M. Aigra on the 5th July, 1866, and it contains the following phrase:—"I can understand that the Emperor desires to stop Prussia, but that he would do so to the detriment of the honor of Italy is extremely painful. To receive Venetia as a gift from France is to us humiliating, and everyone will believe that we have betrayed Prussia. Endeavor so that we should be spored this hard alternative."

THE RUSSIAN WOUNDED AFTER ALMA.—Military critics have fallen foul of Mr. Kinglake for many things contained in his late volume on the Crimean war; and army medical officers have now come forward and denied the accuracy of what he has written regarding the Russian wounded. Dr. Massey, the head of the sanitary branch of the army medical service, in a letter to the *Times*, has related the facts which came within his cognisance, and clearly vindicated the character of the medical officers of the British army. We have been assured by one who was present that, so far from there being any neglect he was particularly struck with the humanity displayed by the English medical officers on that occasion. Whatever apathy or negligence there might have been on the part of the service, there was no ie whatever on the part of the doctors, for a great many medical officers spontaneously went to the assistance of the Russians, sought out the wounded, and did all that men could do for their relief.—*The Lancet.*

THE BELGIAN TIR NATIONAL.—It will be interesting to our Scottish Volunteers to learn that arrangements are being made under the honorary secretaryship of Lieut.-Colonel Beresford, of the 7th Surrey Rifles, for a party of Volunteers belonging to Great Britain to take part in the Belgian Tir National which is fixed for the latter end of next month. Those Volunteers who may wish to enter for the competition at Brussels must send their names to the honorary secretary before the 1st of September, at which time the arrangements will be submitted to His Royal Highness the Prince of Wales, who is the president of the Anglo Belgian Prize Fund. His Majesty the King of the Belgians has given £150 to be shot for by the British Volunteers. Although upon the present occasion the Belgians do not propose to make anything like a national demonstration in honor of their visitors from this side the Channel, yet they will give them the heartiest possible welcome. Their charming capital is also well worth a visit, and it is believed that rather a large party will leave under the command of Colonel Beresford. None will be permitted to join excepting those who have sent in their names.