

## BY-GONES.

"Let by-gones be by-gones,"—they foolishly say,  
 And bid me be wise and forget them;  
 But old recollections are active to-day,  
 And I can do nought but regret them;  
 Though the present be pleasant all joyous and gay,  
 And promising well for the morrow,  
 I love to look back on the years past away,  
 Embalming my by-gones in sorrow.

If the morning of life has a mantle of gray,  
 Its noon will be brighter and brighter;  
 If March has its storms there is sun shine in May,  
 And light out of darkness is lighter:  
 Thus the present is pleasant, a cheerful to-day,  
 With a wisor, a soberer gladness,  
 Because it is thiged with the mellowing ray,  
 Of a yesterday's sunset of sadness.

THE LATEST IMPROVEMENT IN  
MILITARY BREECH-LOADERS.

When the Small Arms Committee decided after a most laborious and carefully-conducted inquiry, that the Martini-Henry rifle was the best and most perfect description of arm which had been submitted to them, they were undoubtedly right in recommending its adoption as the new weapon for the British Army. It never failed during the many severe trials to which it was subjected, and although disappointed inventors protested at the time against its adoption, not one of them could prove that they had any better idea to offer; in fact, the Martini, on its own merits, fairly beat down opposition from every quarter; nor was its triumph at the time undeserved. However, the greatest mechanics in England still cling to the belief that a better, and, at the same time a more simple and inexpensive piece of breech mechanism might be produced; consequently from time to time numerous new ideas have been brought before the public—many of them of much merit—but those who are acknowledged judges of what is required hitherto held that the choice of the Small-Arms Committee had not been surpassed. Yet from the first many defects were pointed out connected with the Martini. It is undoubtedly somewhat complicated and expensive in its construction. Its too numerous parts require much time and skill in their manufacture, and necessitate the employment of elaborate and expensive machinery. The mere "assembling" of the various parts is a matter which has to be taken into consideration. Now that we have erected all the necessary machinery for its construction at our Works, it may be, perhaps, questionable whether it would be desirable to throw aside the selection of the Small-Arms Committee, and adopt a more easily constructed breech action, unless, indeed, it would be proved that an absolute saving would be gained thereby.

In the event of a war, we, ourselves and our colonies, must be supplied with arms, and it is desirable that we should not only possess a good arm, but one which our colonists might be able to manufacture in their own workshops; again, the description of arm should be easily made and inexpensive. Now, to have a cheap arm, and one that would be expeditiously made, we must have few parts to construct, nor should these parts require much nicety of finish, in order to make them work properly. We fear that the Martini, with all its excellence, would prove not only very costly, but owing to the time and care required in its construction, a difficulty would be found, in the event of a sudden outbreak of war, in supplying with proper expedition a sufficient number of

arms for our own masses, whilst our colonies, without the requisite expensive machinery, would be totally unable to provide themselves with the same description of weapon. So, if we can find a breech mechanism at once perfect in all its details, easily and cheaply constructed, one which the workshops of Canada or Australia might rapidly produce, we should be justified, even now, in rejecting the Martini, and adapting our machinery for the construction of a more easily made and less elaborate style of breech action.

The Martini, we know, consist of 30 separate lever pieces—viz., body, lever, block-lever, catchpiece, trigger guard, stock bolt, block, coiled mainspring, extractor, indicator, stock bolt washer, tumbler, striker, nutstop pin block axis, thumbpiece index, locking bolt, thumbpiece, trigger, tumbler rest, block catch lever pin, trigger spring, locking bolt spring, extractor pin, tumbler rest screw, trigger screw, keep screw, thumb piece screw, trigger spring screw, index thumbpiece screw. All of the parts necessitate material in manufacture, and time and labour in finish and fitting; whereas the latest, and by far the most simple and ingenious breech action which has hitherto been invented, that of Mr. Aston, the armourer of the School of Musketry, consists simply of ten parts in all, viz., body, breech block, hammer and tumbler in one, mainspring and sear spring in one, extractor, trigger and sear in one, side lever, claw lever, extractor pin which also holds the hammer and trigger plate, and breech tong pin.

The body, which is fixed to the stock by a tong pin, is somewhat similar to that of the Martini, only much shorter, being but 2½ inches in length, so that it can easily be case hardened. The greater length of the Martini renders casehardening extremely difficult, if not altogether impossible.

The breech block has a slot cut for the hammer to move in, and has a small hole through the center of its face for the point of the hammer to strike the cap. On each side of the breech block is a strong stud for a claw lever to act on when opening or closing the breech.

The hammer, which also acts as tumbler, has one stud on each side fitted for the downward movement of the breech block, by which it is brought to full or half cock. The tumbler end of the hammer is curved so as to act on the bottom end, or foot of the extractor for throwing out the cartridge case. The other end or point is made to press through the small hole in the face of the breech and explode the cap. The hammer can be made to suit either a hook or swivel mainspring. The mainspring is a single flat piece of metal screwed by a pin, and acts also as sear spring.

The extractor is somewhat similar to that of the Martini, and is acted on by the lower end of the hammer when coming to full cock. The foot of the extractor is made longer than that of the Martini, and is bent to a smaller angle, by which means more power can be brought to bear in extracting.

The trigger, which is fitted to the trigger-plate, has a slightly prolonged nose, which acts as sear to enter the full and half bents of the tumbler. No separate sear spring is necessary to secure its action, the mainspring performing this function.

The side lever for opening and closing the breech consists of a flat piece of iron fitted on the right side of the action, and has a simple and most ingenious contrivance to secure it when the breech is closed. By means of this lever the rifle can, at pleasure,

be placed at full or half cock—the hammer having two bents in its tumbler, and a slight downward movement of the lever allows the sear, which is a part of the trigger, to enter the half bent. The lock may again be brought to full cock for firing by a further downward movement without ejecting the cartridge.

The lever which moves the breech block and to which the side lever is attached by a key, consists of a piece of steel acting on the stud of the breech block, to which it attaches itself by means of claw shaped cuts.

When the side lever is lowered the claws force down the breech block, and bringing the hammer to full cock eject the case.

The key of the side lever passes through a round hole in the claw lever, where there is a slot to receive the stud of the key. This stud also prevents the side lever worked out when in use. The extractor pin serves at the same time to secure the hammer and trigger plate. In fact, in every portion of the Aston breech action we are not only led to admire the beauty of its mechanism, but also the wonderful skill with which the inventor manages to economise the parts in the performance of their several separate functions. One pin holds the extractor, hammer and trigger plate; the point of the hammer explodes the cap whilst the other end acts as tumbler, and also as lever to eject the case.

The mainspring is made to perform the double duty of causing the blow of the hammer and at the same time secures the action of the gear. And yet too much work is not imposed upon any single part! In point of fact, the whole action may be said to consist simply of seven parts,—viz., breech block, hammer, extractor, mainspring, trigger, side lever, and claw lever. Moreover, the whole of these parts can be stamped out at a single blow. The action of Aston's hammer is a manifest improvement on the Martini striker. The latter is worked by means of coiled spring, having a force of 45lb., the striker being merely pushed against the cap, whereas the Aston Hammer describes a quarter circle in its descent on the cap, thereby giving it a blow, and requiring but a comparatively light mainspring. Mr. Aston finds that one of a force of seven pounds is amply sufficient. It is computed that the cost of making a rifle on the Aston principle, with everything complete, would not amount to more than 40s., with the Henry barrel, which is the most expensive description of barrel we have. We believe it will yet be found that the Martini action is too expensive and complicated in its construction, and we do not hesitate to say that the Aston breech action has fairly surpassed it, and, indeed, all other inventions, on account of its mechanical perfection, the simplicity of its construction, and the ease, rapidity, and economy by which it can be manufactured.

## PRUSSIAN TACTICS.

The conclusion arrived at by so great a military Power, as Prussia, relative to the fighting formation of her infantry soldiers, cannot fail to be of interest to our readers; and they must also, we imagine, be of the greatest practical importance, coming after the late war experience, and the actual use of tactics based thereon during the last drill season. They are expressed in the following Royal Prussian Cabinet Order, dated March 19, 1872, and quoted in the *Military Wachenblatt*, of April 2, 1873:—