

authorship or age of a Latin hymn requires the comparison, not so much of authorities, as of original manuscripts. The date of the writing is a matter on which many can pronounce, and the occurrence of any remarkable hymn should always be carefully noted. We have as yet only the authority of Mr. Thomas Wright for assigning the *Cur Mundus* to an English writer earlier than Jacopone, but its appearance in an English manuscript of the thirteenth century is not conclusive. The great poem from which Dr. Neale has given us "Jerusalem the Golden," again, is but little known, and its latest editor has for some inscrutable reason omitted to name his original authorities. In fact, the whole subject is in an unsatisfactory condition, and it is disheartening to see a writer apparently so well qualified by education and critical power as Mr. Schwartz wasting his time and ours by such a pair of articles as those to which we have referred.

THE MARTINI-HENRY RIFLE.

THE discussion as to the merits of the Martini-Henry rifle which has been carried on in the *Times* for several weeks appears to have pretty well worn itself out. The controversy has indeed ceased to have any real life in it for some time past, and when it comes to men gravely considering the question by the light of some mysterious law in obedience to which it appears that soda-water bottles ought to travel eternally through space back side foremost, it is clear that they have wandered about as far from all useful discussion of the subject as it is possible to go without losing hold of it altogether. But, although the controversy has all along been overlaid with a vast amount of what may be fairly called rubbish, and has disclosed the fact that a number of practical riflemen, after all, know very little about rifles, it has not been altogether unprofitable, and it has elicited some interesting expressions of opinion from men who have a right to be heard on the subject.

The importance of thoroughly satisfying ourselves that the rifle with which our troops are about to be re-armed is in all respects an efficient and superior weapon is paramount to all considerations of the amount of time, trouble, and expense expended on its introduction; and if it could be shown that the Martini-Henry was in any respect the failure which some of its opponents allege, it would certainly be no sufficient answer to say that it was the result of the prolonged deliberations of more than one thoroughly competent and conscientious Committee, and that the experimental trials with the arm were continued at no little cost over a period of rather more than four years. Nor would it be a sufficient answer, if the arm proved really unsatisfactory, to point out that, if the question were to be reopened, the re-arming of our troops must be postponed for some indefinite period, during which they must be content with the useful, but now somewhat antiquated, Snider-Enfield. On these accounts, while it seems desirable that the subject should receive careful consideration, and that the objections which have lately been so copiously urged against the new rifle should, if possible, be traced to their source, it hardly appears to us necessary to travel over ground which has already been covered in these columns, and to recapitulate the history of the weapon and the circumstances of its introduction.* We prefer to go at once to the point, and consider whether the statements which have recently been made respecting the supposed shortcomings of the arm are such as to justify anxiety, and to warrant any hesitation in the issue of the large number of Martini-Henry rifles now in store. Have we got, in this arm, a thoroughly efficient weapon? is really the question for consideration; to which the further questions whether Colonel Fletcher's Committee properly discharged its duty, or squandered the public time and money, and whether the opposition to the arm is or is not an interested one, promoted by disappointed gunmakers and fostered by rival inventors, are entirely subordinate.

In order to consider this question properly it is necessary to bear in mind that the Martini-Henry, like every other breech-loader, is really a composite weapon, consisting, in fact, of three main elements—the barrel, the breech-action, and the ammunition—and that between these elements there is no necessary and inseparable connexion whatever. Indeed, the Henry barrel was originally wedded to the Henry breech-action, and the Martini breech to the Martini barrel; while both the original arms fired ammunition differing in many essential details from the Boxer-Henry ammunition now in use. It would, therefore, of course be possible to modify or supersede one of the elements of this combination without abandoning or modifying either of the other two. The Henry barrel, or the Martini breech, or the Boxer cartridge, might, either of them, be given up, and the remaining distinctive features of the arm retained. It is remarkable how persistently this elementary fact is ignored in the criticisms of the arm. An attentive consideration of the grounds upon which the opponents of the Martini-Henry rifle allege that it is a failure, will show that there is really very little in common among them as to the nature of the defects. A condemns the arm because it recoils too much; B, because it heats too rapidly; C, because it fouls; D, because the breech-action is "unmechanical"; E, because he objects to a spiral spring. It may no doubt be urged that this only makes the matter worse, as indicating that the arm is thoroughly bad all round, and this would no doubt be the case if the several critics could each make good their respective objections. But it is proper to point out that the force of A's objections is not necessarily

increased by the fact that B and C have also objected to the weapon on separate grounds; the barrel is not necessarily bad because the spiral spring is defective; and the case which has been presented against the arm has no doubt acquired a specious and really unfair importance from an appearance of unanimity of criticism which in fact does not actually exist. It is important, therefore, when the Martini-Henry rifle is condemned, to discover which particular element of the combination is called in question; and on this account it is indispensable that the subject should be treated in detail, and that each objection should be taken separately, and not lumped together with the rest in a manner which, however useful as a means of exciting public prejudice, is worthless for the purpose of accurate and scientific investigation.

Taking, then, the breech-action first, let us consider what are the objections which have been alleged against it, and how far they are tenable. With the objection that the breech-action is "unmechanical" we are quite unable to deal, for the reason that the expression is wholly vague and unmeaning. It was an objection which was very freely used until Mr. Nasmyth gave it what we had hoped would prove its *coup de grace* when, in examination before the Small Arms Committee, he said:—

Mechanical and unmechanical is a sort of slang term in mechanism. . . . There is nothing unmechanical in any constructive arrangement that accomplishes its object, and, if that object is accomplished in a simple and effective way, that combination is good. . . . I think the ends are very admirably attained in reference to the rising block [of the Martini action] by the means employed. It is objected that it is a lifting of the weight at the wrong end. The whole mechanical construction of the human frame is based on lifting weights at the wrong end; all our limbs are lifted at the wrong end, so to speak.—(Q. 70).

The very random assertion that the arm has been condemned by every mechanical engineer who has considered it may be shortly disposed of by the statement that the only four mechanical engineers by whom the breech-action has been formally considered, Mr. Hutton Gregory, Mr. Nasmyth, Mr. Pole, and Mr. Woods, have expressed the highest opinion of it; and to this testimony might be added that of the practical men connected with the Government departments upon whom the duty of manufacturing the weapon devolves.

Passing to the next objection, which has been elaborated with a great parade of mechanical phraseology by Mr. Dunlop, that the spiral spring is defective because it gives a push rather than a blow, it is only necessary to observe that this objection is neither theoretically nor practically tenable. It is not theoretically tenable, because, as Mr. Pole has demonstrated mathematically, "Although the dynamic force of the blow" (struck by the spiral spring) "is less" (than that struck by the flat spring), "the striking velocity is greater; or, in other words, instead of being, as has been asserted, analogous to a dead pressure, the Martini spiral spring really strikes a smarter blow than the old lock action" (Q. 9). It is not practically tenable, because, as a matter of fact, the spiral spring does its work exceedingly well, exploding the caps with a regularity and certainty which leave nothing to be desired. It may be added that every spring goes through a variety of tests before being placed in the gun, including the striking of over five hundred blows; it is very rare indeed for a spring to break, and even if it did, it could be replaced in less than a minute.

Next, it is alleged that the "pull-off" of the gun is liable to vary. If it is meant by this that the construction of the lock is such as normally to involve an uncertainty in the pull-off, then it appears to us that this is an objection which was very completely disposed of by the mechanical engineers who reported on the arm, as any one may see who will take the trouble to refer to the evidence; and if it is meant that the pull-off is liable to be variable if dirt or grit gets in, it may be sufficient to remark that, if dirt gets into any lock, it will work less easily and correctly than when clean; and if the Martini lock enjoys no special immunity in this respect, it at all events possesses the advantage of being exceptionally well protected against the entry of dirt and other disturbing causes. Then it has been said that the pull-off may be easily tampered with in the Martini rifle, and made much less than it should be. On this point we would observe that it would be exceedingly difficult to make a lock which could not be thus tampered with; the Snider lock can be tampered with in exactly the same way, and it can easily be made to pull-off at, say, eight pounds, then at two pounds, and then back again at eight pounds. The trick is so well known to riflemen that it indicates a very strong determination to find fault with the Martini-Henry, or a very imperfect acquaintance with rifles generally, when the new Government arm is represented as being specially open to objection on this score.

The objection that the leverage of the extractor is less than that of some other arms is not worthy of serious consideration, seeing that not the slightest failure has occurred in regard to the extraction. If the lever is sufficient to do its work, that is all that is necessary.

We believe that the foregoing summary exhausts the charges brought against the breech-action, and these charges certainly do not appear to us to warrant the slightest uneasiness as to this portion of the arm. Turning to the barrel, we find that the critics object that the shooting is not always what could be desired, that it fouls and heats rapidly, and that the recoil is excessive. The objection on the score of inaccuracy is not one which has been very prominently put forward, and it is flatly contradicted by the facts. There is no point which was more carefully and precisely investigated before the arm was recommended for adoption, and its subsequent performances at Wimbledon and on the proof-grounds

* See *Saturday Review*, September 17, 1870; April 8th, 1871.

have certainly not belied the promise of its earlier performance. The only trustworthy way of testing the shooting of an arm is by firing it from a fixed rest; and as a very large proportion of the guns and ammunition manufactured at Enfield and Woolwich are daily proved by firing in this way, there is available a mass of accumulated experience of the accuracy of the arm to disprove the curiously incorrect assertion that there has been any failure in accuracy. And even if there had been any such failure, that would be no sufficient reason for assuming that the barrel was in fault—not, at least, until the fault had been shown not to rest with the bullet or powder. As to the rapid fouling, it must be remembered that the fouling of a breechloader does not affect facility of loading; it is therefore only necessary to consider it in relation to its influence upon the accuracy of shooting; and we believe it may be confidently asserted that fouling does not occur in the Martini-Henry rifle within the number of rounds that a soldier would be likely to fire at any one time on service without cleaning, to a degree sufficient to affect the accuracy of the arm.

The rapid heating of the barrel is very simply dealt with—if indeed it has not been dealt with already—by the use of a leather pad or protector; and in any case it is not a defect specially connected with the Martini-Henry, seeing that it would exist in any rifle having the same charge of powder and thickness of barrel. The question of recoil is the next point, and this appears to us to be the most important, as it certainly is the best sustained of the objections against the arm—though even here we have no hesitation in saying that the objection has been exaggerated. Before considering it, however, it may be well to say a few words about the third element in the Martini-Henry combination—the ammunition. Except in so far as the weight of powder and bullet connect themselves with the question of recoil and accuracy, no complaint seems to have been made of the ammunition. The cartridge appears to do its work of checking the escape of gas well, it extracts easily, and its general qualities being the same as those of the well-tried Boxer cartridge, which has been in use with the Snider since 1866, it may be accepted as thoroughly satisfactory. This leaves us with the powder and bullet, and brings us back to the question of recoil.

We find, on referring to the Report of the Committee, dated July 12, 1870, that this point was very closely considered by them, and that among the questions submitted to the troops by whom the two hundred experimental arms were tried was this:—"Is any inconvenience experienced from recoil?" To this question forty-nine answers were returned from different regiments. Of these forty-nine answers, twenty were simply "No"; eleven were what may be called a qualified "No" ("No; but more than with the Snider"; "Not since the men have been cautioned not to place the thumb across the head of the stock"; "No inconvenience, but the recoil is greater than with the Snider," &c.). One regiment returned no reply; the remaining regiments (seventeen in number) replied more or less decidedly that the recoil was inconveniently great, but in the majority of cases it was stated that this did not occur until after a large number of rounds had been fired. The Committee's remarks upon these replies are as follows:—"The great majority of the answers state that the recoil is not excessive. This opinion is in accordance with the reports previously received." These trials were with the "long-actioned" Martini-Henry arm. When the "short-actioned" arm (for the "bottle-necked" cartridge) with a shorter and lighter barrel was proposed, this Committee carefully kept the question of recoil in view, and they reported that they found that, "by shortening and reducing the comb of the stock, the recoil from this rifle" (weighing 8 lbs. 12 oz.) "is less felt than the recoil of the original Martini-Henry pattern arms, which weigh 9 lbs. 7 oz." Two things are apparent from these extracts—1st. That the recoil of the weapon before adoption was pronounced by the large majority of the regiments who tried it to be not excessive—and we have not seen, in the course of the recent controversy, any statement that the army generally has reversed this opinion; 2ndly. That the question of recoil is in a great degree bound up with the question of the form of the stock, and this of course will be a variable element according to the height and make of different men.

The question at present to be considered, then, is whether the opinion expressed by the majority of the regiments as to the recoil of the experimental arm is still retained by the rank and file with regard to the present arm; and this, as the *Times* very properly observed, is a question which can be decided by the rank and file of the army, and by no one else. If there are any *prima facie* grounds for instituting this inquiry, it should be carried out forthwith, and a conclusion could be arrived at in a very few weeks—if, indeed, the School of Musketry is not already in a position to state authoritatively the opinion of the men on the subject. If the replies should generally be to the effect that the recoil is inconveniently great, then what steps would have to be taken? Not, happily, the very serious step which the opponents of the arm and rival inventors would gladly persuade the public is inevitable—the abandonment of the Martini-Henry rifle in favour of some other weapon, but simply the readjustment of those elements upon which the recoil, or the inconvenience experienced therefrom, depend; and these elements are three in number, (1) form and length of stock; (2) weight of arm; (3) weight of charge and bullet. We trust that the verdict of the army will be that the recoil is not excessive—it is, at any rate, no greater than is experienced with an ordinary fowling-piece firing $3\frac{1}{4}$ drachms of powder and $1\frac{1}{4}$ oz. of shot, being only about 63 lbs. as compared with 53 lbs. with the

Snider; but if it should be otherwise, then one or other of the solutions indicated above may without difficulty be adopted. Of the three it is probable that the reduction of the weight of charge and bullet would be attended with the least inconvenience; and experiments have shown that a slight reduction of the weights of the bullet and powder (as, for example, to an 80-grain charge and a 410-grain bullet) may be effected without materially prejudicing the practical efficiency of the rifle. Of course a 410-grain bullet (with 80 grains of powder) would have a somewhat inferior range, accuracy, and penetration at long ranges to the present 480-grain bullet and 85-grain charge; but it would, we believe, possess a flatter trajectory at what may be regarded as the normal fighting ranges, and the reduced weight would certainly allow a rather larger number of rounds to be carried. If the recoil were also thereby sensibly reduced, the balance of advantages would probably be considered to incline to the side of the lighter bullet and charge. But although we should be prepared to regard this slight reduction with tolerable complacency, we are of opinion that the present weights should not be disturbed without thoroughly sufficient reason, because those weights have been demonstrated, by the most exhaustive experiments, to form, with a .45 inch bore, the best shooting combination that can be contrived, and it is undesirable that we should be content with second-best so long as the best is within our reach.

A careful consideration of the criticisms to which the Martini-Henry rifle has been recently subjected can hardly fail, we think, to bring dispassionate observers to the conclusion that the outcry which has been raised against the arm is not justified by any defects which our experience of it has brought to light, and that, with the solitary exception of the alleged inconvenient recoil, all the objections which have been urged are objections which have been urged, considered, and disposed of over and over again. There appear to be no grounds whatever for the slightest anxiety on the part of the army or the public, still less for any reopening of the question. As regards the single objection worthy of serious notice—namely, that the arm has an excessive recoil—we have yet to receive the verdict of the men for whom this weapon has been manufactured as to whether this objection has any real practical existence, and whether such complaints as have been made on this score have not been greatly exaggerated. But if the recoil should be considered by the army at large to be inconveniently heavy, this defect would in no way impugn the principle of the arm, whether we consider the breech-action, the barrel, or the cartridge, and can be rectified in a manner which will leave us with what, we have no reason to doubt, will still be the most effective breech-loading rifle yet introduced for military use.

REVIEWS.

KHIVA.*

"WHEREVER there is anything uncomfortable to be done," said the Chairman at the dinner of the Newspaper Press Fund, "there is the Special Correspondent is sure to be found." Nothing now is too remote or too arduous for his adventurous spirit. The arid plains of Behar, the dense jungles of West Africa, and the glowing sands of Turkestan, have, during the last twelvemonth, been witnesses of his energy. The writer of the present work is an American gentleman, the Correspondent of the *New York Herald*, and we commence by saying that he has given us a record of his adventures, graphic, spirited, interesting, and entirely free from those innate or inherited failings to which the race of men who have occasion to use both pen and revolver is justly supposed to be liable. Mr. MacGahan is also a sportsman; something of an artist in his descriptions, though not able to handle the pencil or the brush; if not acquainted with Turkish or Persian, he has made some progress in two or three European languages; his style is free from what we have been accustomed to reprehend as Americanisms; and the whole book contains no passage which we should wish unwritten, no outburst of national antipathy, and scarcely a single instance of bad taste or ungenerous feeling. The conviction left on the mind after an attentive perusal is that the writer has compressed into the space of five months a remarkable variety of events well worthy of narration, and has told us nothing which he has not personally witnessed, or which he has not every reason to believe to be substantially true. He has judiciously divided his book into three parts. The first is taken up with an account of the obstacles and perils of his stern chase after General Kaufmann; the second with the attack on the capital of Khiva; the third with a flying expedition to punish the Turcomans, who have become infamous as the pirates of the desert. The chapters are very numerous and very short; the most striking scenes are illustrated by sketches taken from the Russian artist Verestchagin; and the style is of a kind which never wearies or disgusts. To convey a just idea of the campaign, it was inevitable that the author should dwell on his own personal adventures; but we are quite certain that any redundancy in this part of the work will be readily pardoned, even without the pleas put forward in the preface, that the country was strange, the circumstances peculiar, and the manners and customs

* *Campaigning on the Oxus, and the Fall of Khiva.* By J. A. MacGahan, Correspondent of the "New York Herald." London: Sampson Low & Co. 1874.