

Magazine and Small-bore Rifles.

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(Continued from page 523.)

More important, however, than conversion was the question of a new arm. Indeed the war office had hampered the action of the Small Arms Committee—though the fact is not mentioned here—by directing their attention rather to a single loader and impliedly shelving the magazine arm. It was decided by the Committee that the block action should be abandoned and the bolt action, in use on the continent for the previous 20 years, adopted. About this time the war office, yielding to the pressure of military opinion as expressed by the newspapers, accepted the decision of the committee that the arm of the future should be a bolt-action magazine rifle, with a calibre of 0.402 in. Experiments were now continued with increased energy, and it was sought to ascertain what system of repeating rifle came up to the following standard of qualification: (1) strength to stand the rough usage of service in the field, (2) non-liability to get out of order; (3) easy extraction of cartridge-case after firing; (4) lowness of trajectory; (5) accuracy; (6) ease of manufacture and repair.

The American Lee, which had undergone all the tests successfully, was discarded, as the military authorities were opposed to the principle of a detachable magazine, and also because it was found difficult, if not impossible, to fill the magazine when it was on the rifle.

In the autumn of 1886 the other two rifles were tried by the navy, and the Owen Jones was condemned, apparently because the mechanism was complicated, costly, and difficult to repair. The Lee rifle was then again taken into consideration, and it was found possible to fix the magazine to the rifle by a screw and to fill it from above when thus attached. Consequently the objections of the military authorities disappeared. The Lee rifle thus altered was christened the "Improved Lee." This rifle and the Lee-Burton were the only two surviving rifles. The choice was really between the positions of the magazine—the breech action being the same—the magazine in the Improved Lee being under the action in front of the trigger-guard, while in the Lee-Burton it was in an overhanging position on the right of the action. In May, 1887, 300 rifles of each description were issued to the army and navy for trial at home and in India. The result was a preference for the Improved Lee. During the various trials the small-bore question was constantly presenting itself, and the subject is certainly only second in importance to that of the best description of magazine rifle. The great obstacle was that 100,000 of the new 0.402 in. Enfield-Martini had been manufactured, and "that many distinguished officers were strongly opposed to any further reduction of bore." In spite of this formidable obstacle, the committee continued trying experiments with the Swiss Rubin 0.295 in. rifle, and became convinced that a small was superior for military purposes to a large bore. An ounce of practice is worth a ton of theory, yet the advocates of the large bore had certainly strong arguments on their side. The great Duke of Wellington, whose opinion on military matters still carries weight with some, had strongly maintained the importance of a heavy bullet on account of the disabling shock it inflicted on the man struck by it. Many officers probably remembered that during the Indian Mutiny rebel Sepoys had been able to do serious damage after being mortally wounded by a revolver bullet. The opponents of a reduction of bore actually supported their case by arguments which may be summarized as follows: No nation in Europe had adopted a small bore. A small bullet would not stop charging cavalry. Accuracy would be unattainable, for the bullet would be affected powerfully by the wind. The fouling of a small barrel would be excessive. The question of ammunition would be difficult to solve. The committee, however, found that under all circumstances of weather the small-bore was superior in accuracy to the Martini-Enfield; that there was very little fouling; and that experiments on carcasses and against steel plates, wood, rammed earth, etc., justified a belief that the small bullet would be sufficient to stop cavalry. They admitted, however, that the question of ammunition was a difficult one. Perhaps the committee have drawn a rather unreliable inference as regards the shock from the effect of the small bullet on carcasses. With the ammunition now used no greatly increased velocity is given to compensate for reduced weight and horizontal section, the muzzle velocity being only 1,750 ft. per second. One would have liked some sportsman to try both bullets on large game, and military men will feel easier when the only true test—that of war—shall have been successfully applied. That question, however, being set aside, there can be no dispute about the numerous advantages possessed by a small-bore rifle over one of a comparatively large calibre. They are these: Reduction in size and weight of cartridges—115 rounds of the new ammunition weigh no more than 70 of the Martini-Henry. Increased accuracy and penetration. Practical absence of recoil. Higher muzzle velocity giving a lower trajectory; using the fixed sight a man can be struck up to 470 yards. Saving in transport of ammunition—a greater number of car-

tridges can be carried in the magazine of the rifle without increasing the weight of the former.

The committee, having decided in favour of a small-bore, carried out various experiments with a view of deciding on the exact calibre, rifling, breech-action, magazine most suitable for military purposes. In short, they determined to build up an arm which should combine all the best points of various systems with such alterations and improvements as further experience suggested. The result was a rifle with a 0.303 in. calibre, the Metford system of rifling with seven grooves and one turn in ten inches, a detachable magazine on the American Lee system, secured from loss by a steel chain, and "an extreme range aperture," back-sight, and dial fore-sight giving elevation up to 2,800 yards, a weight of 9 lb. 2½ oz., and a magazine capacity for eight cartridges. While reducing the bore, the committee likewise decided to shorten the bayonet—sword bayonet—to 12 inches, experiments and combats between men with bayonets of various lengths and shapes having established the superiority of a short over a long side arm. In September, 1887, six rifles were made by hand for trial, and in January, 1888, a pattern rifle and side arm were finally approved by the committee, and submitted for a practical test by the army and navy. The number of arms manufactured is 350 rifles and 50 carbines.

The committee found it very difficult to decide on the best description of ammunition, and experiments are still being made. Colonel Slade says in the report before us, "There is but little doubt that the explosive of the future will be a smokeless chemical powder, but it is safer at present to trust to compressed pellets of ordinary black or brown powder." The trials have hitherto been made with the Swiss Rubin cartridges. The French and Germans are using chemical compounds which give a high muzzle velocity, but nothing is yet known as to the keeping qualities of these compounds in hot and damp climates. The bullet has a lead core, with an envelope of some other metal, a purely leaden bullet being found unsuitable, as, owing to the increased velocity and the rapid twist, the barrel becomes leaded after a few rounds. For the envelope copper, nickel, and steel have all been tried. The objection to copper is that "the first shot out of a clean barrel is very erratic, and the copper flies off from the lead on striking. It is possible that if this bullet was used in civilized war it would be considered as an infraction of the Geneva Convention." The committee prefer steel if rusting can be prevented and should it be found that the barrel is not injured. Failing steel they prefer nickel. The Lorenz Company have a method of soldering the nickel on the lead core, and this has given satisfactory results, as the nickel does not fly off on striking.

The ammunition question is, indeed, the only remaining difficulty, and that is one as to which the Swiss, notwithstanding the devotion of years to the subject, still confess themselves unsatisfied. In other respects the committee have reason to congratulate themselves and the army, for they have devised a weapon which, take it all round, is probably superior to any other rifle yet adopted. Its accuracy certainly leaves little to be desired, for the absolute mean deviation at 1,000 yards is only a little over one foot, and at an experiment at Aldershot on August 23, at 1,100 yards, 78 per cent. of hits was made.

Whatever may be the final decision as to details, it may be hoped that the authorities will lay to heart the following sentence of the report:—"Perfection and finality are unattainable in military weapons, and as the question has been so thoroughly threshed out and considered from every point of view, any further delay in issuing the new arm is very much to be deprecated."

Personals.

When Sir Adolphe Caron, Minister of Militia, visited St. Johns, Q. to inspect the Military School there, he was received by the Mayor, Duncan McDonald, and presented with a complimentary address, to which he replied in felicitous terms.

General Sir Donald Stewart, of the India Council, and Sir George Stephen, president of the Canadian Pacific Railway, were both born at Dufftown, and were class-mates in the village school. They revisited their native place together a few weeks since, and were received with an imposing demonstration of welcome. Brass bands played the "Auld House" and "Highland Laddie"; the streets were illuminated with Japanese lanterns; and the "illustrious guests" were entertained at a public banquet in the afternoon, at which the health of the most famous of Dufftown boys was drunk with the utmost enthusiasm.

Lieut.-General Laurie, recently unseated, will again be the Government candidate at the election to be held in Shelburne, N. S., on the 22nd inst.

The German Emperor is reported to be about to change the uniform of the Imperial Navy. Orders have been sent to one of the Plymouth outfitters for pattern-sleeves of the various ranks in the British service as copies.