

may not unlikely prove of great value to the allies of the Porte in case of need; while, with first class vessels, good men, and a rising generation of well instructed officers, there is no danger but that Turkey will be quite able to hold her own, at least at sea, with any power with which she is likely to come into collision.

THE 400LBS. SHELL OF THE HERCULES.

There may now be seen at the south Kensington Museum a full size model of a 10 inch 400lb. common shell, similar to the one which recently disabled the 18-ton gun of the *Hercules*, but strengthened with five iron ribs, instead of being weakened with fourteen stud holes, each three tenths of an inch deep, and one and a half inch wide. To obviate the "oblique" movement of the axis which checks the exit of the shell, dislodges the fuse composition, and causes premature explosions, the model of the *Hercules* 400lb. shell has had substituted a total rotating bearing of 115 inches on strengthening ribs for the six inches on weakening studs now relied upon. The grooves in the gun, to receive these five iron ribs, would only be about one half the depth and one half the width of these in the *Hercules* 18-ton guns, and would necessitate the removal of only 14½ lbs of metal from the bore, instead of 61½ lbs., as at present. This system of long centering ribbed bearings gave higher velocities, and better endurance than the present service short stud bearings when tried against them in the heavy gun competition of 1865. On that occasion, the so-called "Woolwich" rifling, with increasing spiral, destroyed its 7-inch 7½ ton gun in 567 rounds, whilst the ribbed rifling left the lands and grooves unimpaired after 417 rounds. Moreover, the 110lbs. ribbed shot, though precisely similar in all respects, except the rifling, to the "Woolwich" one, struck a muzzle blow 133 foot-tons heavier than the latter, and was thrown at 2° of elevation to 1473 yards, with 5lbs. less powder charge than the "Woolwich" one took to reach the same distance. Thus, without any change, except in the rifling, a stronger shell is provided, with the effort of rotation diffused over nearly twenty times the surface, and a stronger gun is obtained with less strain upon it. The striking force, the powder capacity, and the endurance of the projectiles of the *Hercules*, would thus be greatly increased; whilst the Royal Arsenal authorities have certified that the strong ribbed shell would cost £77 per thousand less than the weak studded one and the rifling of the gun be done at one fifth less cost. As our heavy guns are occasionally injured by their own projectiles, even when firing deliberately at a target, a reconsideration of the mechanical principles involved may not be ill timed or unnecessary.—*Broad Arrow*.

(From the Army and Navy Journal.)

As the work of establishing a rifle range for the National Guard of New York progresses, evidence come in from all points not merely of the general interest felt in the Rifle Association and its work, which is of gratifying extent, but of the real importance and necessity of such an establishment in the military training of our citizens. The subject is one to engage the interest of the Army as well as that of volunteers and civilians generally. A dozen years of training has given the men who meet at Wimbledon a discipline and comprehension of a rifleman's duties which tells very perceptibly in the work at that range. More than that, it has

made the English Volunteers a body of marksmen of really remarkable efficiency. Each year improvement is shown either in the increased accuracy of crack shots or in a general advance of marksmanship down the whole score—a much more valuable fruit of experience than the improvement of a few wonderful shots. The truth is that for every shot fired on the range, many thousand have been fired during the year in private, or at weekly or monthly meetings at district ranges. It is this preliminary drill that is the most useful part of the system, for it is this in which the great mass of volunteers and civilians take part. The picked sixty and the special prize winners serve to call out more extended efforts, like those intense electric currents which give rise to much larger though less intense induced currents of electricity.

But we need not go so far as Wimbledon for proof of the great results which spring from a faithful system of rifle practice. The committee which, on behalf of our Rifle Association, visited Canada to inspect the ranges there, bring home information which we are sure will be surprising to most of our readers. The Dominion has no less than seventy six ranges for practice, one for each section of the country. Most of these are second rate, as might be expected in thinly settled parts of the country. By second rate, we mean that they do not include a 1,000 yards range, which requires an extent of ground and a supply of targets that must task a small community's resources. But these lesser ranges have facilities for shooting at two, four, six and some of them eight hundred yards. Compare that with the average distance in this country, where men meet to try conclusions harmlessly against a target. In the more thickly settled parts of the Dominion are a number of ranges which are of the first order, and at them the grand meetings of the year are held.

It is easy to ascertain the effect of the ten or eleven years of training which the Canadians have had. The country is full of men who can come down here and compete with our best men; and among them is a fair, or rather a large proportion of men who would be accounted crack shots in any company. At Montreal this year one man made four bull's-eyes out of five shots at 1 000 yards. At Wimbledon last July the Canadian team, made up of eight selected men, took the prize against eight selected Englishmen. The day was bad for shooting, the effects of a mirage being intensified by a peculiarly deceptive light; but the Canadians made an average of 66.5 against the 65.5 of the Englishmen. The result is all the more remarkable when we consider the vast preponderance of population, and especially of trained population, which England has over Canada.

The military preparation of Canada is of no slight importance. Forty thousand active militia are trained every year and with some thing more than a show encampment and target-excursion drill. They are placed in camp, learn the duties of the soldier, and this personal instruction is supplemented and made efficient by enforced practice with the rifle. Thus Canada accumulates a force which, when well trained, is a formidable army. Her men understand themselves, their officers have experience of command, and the force is effective in the best sense of the word. If the Canadians ever fight at all, they will probably fight us, for there does not appear to be any body else with whom they can seriously quarrel. That such a contest is likely to come for many years, we doubt. Both peoples, so far as we know them, are seriously inclined to peace. We

certainly have little care for Canada, in spite of the talk across the border and in England. Were it not for the frequently repeated lesson of history, that no nation can hope to exist very many years without a war, our neighbors might abandon their well arranged military system and keep their targets for peaceful practice. But if a war does arise between us, or between England and ourselves with Canada involved, the immediate consequences of meeting such well-drilled marksmen, unless we speedily emulate them in practice, will be unfortunate for us, whatever the result of the war may be.

We are glad that the military spirit, of which the Americans have proved themselves the possessors, is to have an opportunity to express itself in legitimate and honorable methods of acquiring a knowledge of the most important duties of war. The range at Creedmoor, established by our National Rifle Association, will, from the necessity of the case, be a first-class range, and to an unusual degree, for with the exception of a few short ranges, all the targets will be at 1,000 yards distance, and shorter distances will have to be shot on the same ranges. Everything will at the start be as complete as it is possible to make it, and when the experience of others has been culled to the best of the managers' ability, the future improvement of the range will be left to the criticism of use.

The steamship *Pennsylvania*, the first ship of the American Steamship Company's Philadelphia and Liverpool line, and the first American iron ocean steamer, was launched from the yard of William Cramp & Sons, in Philadelphia, August 14. The following are her principal dimensions. Length over all, 355 feet; length from forward part of stem to sternpost, 343 feet; from forward part of stem to propeller, 336 feet; beam extreme, 43 feet; depth of hold from top of floors to top of spar deck, 32 feet 6 inches; tonnage, old measurement, 5,016; capacity of coal-bunker, 720 tons; cargo space, 3,554 tons. Her draft will not exceed 20 feet 6 inches in fresh water, with coal-bunkers full, and a dead weight cargo of 1,740 tons (2,240 pounds), or a measurement cargo of 3,554 tons (forty cubic feet) also a full complement of saloon and steerage passengers, officers and crew, all necessary stores and outfit on board. Passenger accommodation is provided for 76 in the saloon; the steerage will afford accommodation for 554. The average contract speed is to be 11 1 2 knots on an average consumption of 40 tons (2,240 pounds) of coal in 24 hours. The *Pennsylvania* is brig-rigged, with masts 51 and 58 feet above spar deck, with topmasts 31, 16, and 10 feet; yards 63, 47, and 34 feet. All the standing rigging is of wire, of proper size; running rig of Manila, fitted with all suitable sails and tackling necessary for the North Atlantic service.

The *Superb*, the largest ironclad ship of any yet constructed, one of four new vessels to be built at Chatham dock yard, is ordered to be commenced on one of the large building slips at that establishment, and to be pushed forward to her construction, so that she may be ready for launching during the ensuing year.

The French Jockey Club has decided on placing in its library a marble slab, on which will be inscribed the names of such of its members as fell before the enemy in the late war.