

The Gun Experiments at Erith.

To the Editor of the Times.

SIR.—It may be interesting to some of your readers to hear from an eye-witness to these experiments the impression they produced upon his mind, coming after the Ordnance experiments upon the 38-ton gun of Her Majesty's ship Thunderer.

Full accounts of both sets of experiments have appeared in your columns, and I need not repeat the details. It is necessary to remark, however, that an important inference which has gone the round of almost all the papers requires correction. That inference is that the explosion of the second gun of the Thunderer, experimentally fired, was exactly similar to that of the first. This, as I think, is altogether false. The second explosion was much more violent than that of the first gun. It split up the gun much more completely and in an essentially different manner. The mechanical indications, to my mind, are that the first gun split in consequence of a jam caused by previous injury: while the second gun, which assuredly was double loaded, shows evidence of bursting from excessive pressure of the powder gases. Both the oral evidence of the witnesses at the inquiry and the condition of the fragments of the gun lead me to an entire disbelief in the theory of the committee's report, that the first gun which burst so disastrously was double loaded.

However that may be, the gun was confessedly not strong enough to bear double loading without disaster. Sir William Palliser's experiment was directed to show that there was no real difficulty in constructing a gun which would stand this test, without any increase of weight or expense, but simply by a proper distribution of material. He took an old cast-iron gun which had done duty in the Crimea, and had since been much knocked about by accidents (including injury from being struck by Russian shot), by exposure, and by experiments—private persons cannot afford 38-ton guns to break up; he lined it with a coiled barrel of soft iron, like that of a fowling piece or musket, only on a larger scale. It then weighed 55 cwt., or exactly one-eighth of the 38-ton gun. He began by firing it with a double charge of powder and shot, in exact proportion (namely, one to eight) to that which burst the Thunderer's second gun, and he then proceeded to increase both charges, of powder as well as of shot, until, at the fifth round, the powder charges were one-fifth of those which burst the Thunderer gun, of eight times its weight, and the shot one-seventh. The result is that the gun has sustained but slight injury, a very small enlargement of the inner lining being all the damage done. There was no destructive or dangerous effect, unless the violent recoil, inevitable with double loading, can be so called. The increase of the charge, so far beyond the proportion between the weights, meets any question which can arise as to the fairness of a proportionate comparison between great and small.

The success of Sir William Palliser's experiment is probably due to a proper distribution of the different materials used in the gun. He puts the soft tube, having great extrusion, on the inside, where great extrusion has to be provided for, and the highly elastic, but unyielding material on the outside, where from the nature of things but little extrusion can take place. Sir William Palliser has no monopoly of a gun which will stand heavy charging; his only claim is that his soft iron gives notice before bursting. Sir Joseph Whitworth has shown that he also can meet the pressure test. It is the Woolwich gun (a gun turned inside out from what would be the proper mechanical arrangement, and built up in an insecure and incoherent fashion, to suit this inversion) which was never designed to bear a double charge.

Some disappointment has been expressed that pressure gauges were not used by Sir W. Palliser. I share the disappointment. The reason for it is apparent—namely, the difficulty of procuring them in a reliable form at short notice without unduly delaying the experiments. But I am much more disappointed at the failure of the gauges in the Woolwich experiment with the 38-ton gun. This failure was rendered certain by the precaution previously taken that they should record no pressure under 38 tons to the square inch. It is, in my opinion, matter for serious investigation why the pressure gauges were so treated. An inquiry into this point is the more needed, inasmuch as the effect of this failure had the convenience of concealing from the public how little pressure was really required to burst the Woolwich gun; and, without imputing this as the result of design, it remains equally necessary on the supposition that it arose from ignorance of what was to be expected from it. Anyhow, the facts are against the treatment.

How does it happen that this condition of things has come about—that we have a bad system of artillery construction, obstinately adhered to and defended with the most persistent misrepresentation of fact and theory in the public press and at meetings of which an example is to be found in the statement generally circulated as to the identical character of the bursting of the two Thunderer guns, when there are among us those who know better and who can do better? One proposed solution of this enigma is that our artillery manufacture has got into the hands of a small circle of officers whose education was completed 20 years ago or more, and who have educated all their juniors into a thorough belief in the system. Another solution, less satisfactory, has been sought in the large mercantile interests lying wholly outside this circle of artillery and ordnance authorities which are known to be involved in maintaining the reputation of the Woolwich gun.

It is essential to us as Englishmen to secure the very best weapon we can procure. Instead of our now securing the best, we actually see the better guns made here for sale to those who may use them against us. This, in my humble opinion, is an urgent reason for an inquiry into the whole matter by a Royal Commission, on which independent scientific knowledge should be strongly represented.

I have the honour to be, Sir, your obedient servant,

C W MERRIFIELD

The Thunderer's Guns.

A Times correspondent writes:—

The remains of the second 38-ton gun have now been all collected, and a comparison can be made between them and

those of the gun which burst on board the Thunderer. It will be at once seen that the conclusion jumped at on the occasion of the second explosion is, at all events, premature, for the explosions are of completely different characters. In the first gun the bore is not expanded much beyond the broken edge of the steel tube which remains in the stump of the gun. In the second the bore is expanded and the steel tube is expanded over the whole of the space which had been occupied by the front charge of powder. In the first gun the huge band or jacket, which encircles the main body of the gun, and which weighs many tons, is quite intact, in the second it is burst from end to end, and a portion of it is blown clean away. When the first gun was fired the water compressor which checked the recoil was uninjured, but when the second gun was fired with two charges, the violence of the recoil was so great that it burst the compressor. In one word, the nature of the second explosion is much more violent than that of the first; the recoil was much greater, and the seat of the explosion was much further back towards the breech of the gun. Do not these facts prove that the first gun could not have been double loaded?"

The Services and the Civil Engineers.

The following remarks of H. R. H. the Duke of Cambridge, Field Marshal Comdg. in chief are worth reading in connection with those of Lieut-General Sir Edward Selby Smyth, on the subject of efficiency and politics. There are many points in the remarks of His Royal Highness especially applicable to us as Canadians.

The annual banquet of the Institute of Civil Engineers took place on Saturday last. Responding for the Army and Auxiliary Forces, the Duke of Cambridge said that of late years the Service had been subject to a great deal of criticism; but he thought of the whole that the devotion of both officers and men had been recognized in the recent contests in which the country had been engaged. Referring to the controversy on the length of service in the army he said that he wished to remain neutral; but he said it was necessary to hit upon a period of service. He noticed with pleasure the presence of his friend Lord Chelmsford, who, from his recent experience, could speak with authority on the subject but it might be put to them whether they would prefer workmen of skill or boys in anything that had to be undertaken. The point in dispute had not yet been settled, but he hoped it soon would be settled, he hoped, would materially aid us to hold our own with the small force we possessed against other great countries of the world, but he was only speaking the sentiments of a soldier when he said that he wished to remain at peace with all. They might depend upon it, however, that a powerful man was much better off than a weak one. A weak man might have to submit to any insult, but a man on an equality with another neither insulted his neighbor nor was insulted himself. As with individuals, so it was with nations, and he therefore gladly found himself supported in the opinion that the efficiency of the Army, Navy, and Volunteer forces should be maintained. The army at the present moment was the most placid element in the country, for the army knew no politics. Rather than see an army become political he would have no army at all. These, he believed, were not only his own sentiments, but the sentiments of the profession. There was time when the Volunteers had not attained the proficiency which he was glad to say both the Militia and Volunteers had now attained. Those bodies were now powerful elements in the organized forces of the Empire. With regard to the Royal Regiment of Artillery and the Corps of Royal Engineers, he was proud to be the Colonel of those regiments, and speaking for them as well as himself, he would say that they entered cordially and heartily into all the great undertakings of the Civil Engineers.

A Writer in Notes and Queries suggests that Mrs. Butler has committed an anachronism in her famous picture of the 28th at Quatre Bras: representing the men wearing pantaloons instead of the old-fashioned breeches and long gaiters. It happens, however, that the artist is right and the querist wrong. In Colonel Cadell's Narrative of the Campaigns of the 28th Regiment, published some forty years ago, the story of this article of clothing is told. When the troops were preparing for the Waicheron Expedition in 1809, three regimental commanding officers in Colchester Camp agreed to make trials of different patterns—the use of grey cloth trousers on field service having already become recognized. One regiment had theirs made like breeches, to wear with long black gaiters, another had theirs buttoning down the outer seams like splatardashes, and the 28th had theirs of modern shape. On the return of the troops, or rather the survivors, twelve months afterwards, notes were compared. The 28th were still serviceably clad, the others were in tatters. And so the modern pattern came into general use on service. The Horse Guards Order directing the supply of "grey cloth pantaloons and short grey cloth gaiters instead of white breeches and long gaiters" to the depots of all regiments in the field was not issued, we believe, until 1814; and the old-fashioned costume was worn for parade purposes by the Foot Guards until many years later.—Broad Arrow.