

THE
MECHANICS' MAGAZINE.

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THE ARMSTRONG GUN.

A SERIES of articles has lately appeared in this magazine, having for their object a zealous and impartial inquiry into the facts of the great national experiment—the Armstrong gun. We have deliberately examined and accurately noted the course of this experiment from its earliest proposition to its latest development; and the details supplied by us will, we think, show that in the construction of this gun mechanical conditions have been disregarded, and in the construction of the shell the laws of chemistry have been overlooked, or not understood. Hence our verdict that, “let the Government say or do what they will, the gun cannot remain in the service.”

The matter is, however, so serious, and considering the army of workmen at present engaged (some ten thousand men) upon what can only be regarded as a remarkably interesting experiment, we conclude the time is arrived when the Government should, for its own justification, sanction the appointment of a Commission of competent engineer, artillery, and naval officers to investigate the whole question. Doubtless the House of Commons contains members who, from a sense of duty to their country, will not fail to urge this matter; and we would suggest that, if granted, such a Commission should consist of such men as Sir John Burgoyne, General Sandham, Sir Frederick Smith, Sir Thomas Hastings, Colonel Lefroy, Colonel Boxer, Captain Jermingham, and Colonel St. George: others might be named; good men and true are not wanting. In an inquiry like this, the highest scientific evidence must be collected, because our national honour hangs upon the question. And we beg to suggest that the examination should embrace the evidence of such men as Colonel Desborough, C.B. (whose 24-pounder howitzers saved the Armstrong guns from the Tartars), Colonel Barry, Captain Milward, and, though last, not least, General Crofton and Major Hay. These are the men who, if permitted by the War Department, can speak of their China campaign. There must, however, be no Government influence used. In addition to these, we would call the evidence of the officers in charge of the twelve batteries of Armstrong guns supplied to the Woolwich divisions. Let them report in what state their guns are, in what condition the screws and vent-pieces are, and, in fact, the general efficiency of the guns for service. Let this be done, and we shall no doubt acquire useful and important information.

The Government need not fear the appointment of this Commission. In sanctioning the huge expenditure on the Armstrong experiment they only acted on the best information then at their disposal. But so many fresh facts have been developed during these great and costly trials that a continued outlay of money on the same scale could not be justified, unless the highest scientific opinion in the kingdom is taken before such a Commission on the facts so developed.

We have one word for Sir William Armstrong. The papers publish his disavowal of our statements at a City dinner. We are content to accept his statement for what it is worth, because we are well aware of the efforts he is himself making in the attempt to meet our ob-

jections to his gun and projectiles. Let him rest quiet for a few weeks, and out of his own mouth we shall be justified and he will be condemned. It is scarcely necessary to say, that in pursuing this investigation the MECHANICS' MAGAZINE is actuated by no personal motive towards Sir William Armstrong, or any one else. We only desire to state the truth. No one can deny that our suggestion for a Commission is a pre-eminently reasonable one; and the character of the men we suggest as witnesses is the best guarantee that we want nothing but what is just towards Sir William Armstrong, the efficiency of the British service, and the pockets of the British tax-payer.

OCEAN TELEGRAPHY AND GUTTA PERCHA.

SEVERAL recent failures to lay down successfully submarine cables have attracted general attention. It is important to inquire into the cause of these failures, and to ascertain whether they are preventible or otherwise. Many writers have laid the blame on the insulating material of gutta percha, and various new substances have been recommended for adoption in future cables. Not a few persons have given currency to the report that gutta percha has been found to be decayed by the action of the water.

It is well to test the accuracy of such statements. From the reports of the submarine companies, and the testimony of the eminent telegraphic engineer, Mr. Latimer Clarke, it appears that at the present time some thousands of miles of submerged wires insulated with gutta percha are now actually in successful operation; and so far from the gutta percha being injuriously affected by the action of the sea-water, experience has proved, even after having been submerged for several years, that there is not the slightest deterioration, but the reverse. Mr. Latimer Clarke's testimony is:—“I have never yet seen a case of decay of gutta percha in submarine cables.”

Mr. Andrews, the late engineer of the Submarine Telegraph Company, had occasion, a short time ago, to repair some damage to the Dover and Calais cable, arising from the anchorage of a ship. He took this opportunity to test, with his most delicate instruments, the condition of the gutta percha, and he reported—“I found the insulation most perfect.” As this cable was originally laid down in 1851, this testimony of ten years' trial is at the present time of great importance; and before electricians adopt any new insulating substance, it will be well that they should thoroughly satisfy themselves, by the severest test that experience and time will afford, of its *bona fide* superiority to gutta percha.

The fact is well known that gutta percha is injuriously affected when exposed to the action of the atmosphere; but it is not, perhaps, generally known that gutta percha *improves by being sunk in the sea*. A striking illustration of this fact is published in the recent report of the Atlantic Telegraph Company. A portion of the cable of that company, lately recovered from the coast of Newfoundland, has been subjected to electrical tests, and found to be in a decidedly better condition than when manufactured about two-and-a-half years ago. This statement is also confirmed by the engineers of the Government cable intended for the Falmouth and Gibraltar line, who state that the cable, after six months' immersion, was decidedly better than when newly made. The wire for this Government contract developed another remarkable property. When tested by Mr. Reid's patent process—although the coils were

placed in tanks, under a pressure of 600 pounds to the square inch—it was found that the electrical resistance of the gutta percha was actually increased some 15 per cent.!

Since the Dover and Calais cable was laid, very great improvements have been made in the purification and manufacture of gutta percha for the insulation of telegraph wire. This plastic material is now spread over the strand of copper wire in several layers or coverings, without any seam or joint. The improvements, even since 1857, in the manufacture of wires, insulated with gutta percha, show a perfection of insulation formerly altogether unattainable.

The recent extraordinary disclosure in one of our law courts proves that a most careful oversight is necessary until the insulated core is finally submerged. If due care be taken of the core during the process of manufacturing the outer protection of the cable, and ships are provided with proper mechanical appliances for judiciously paying it out, there is perhaps no reason why submarine cables should not be everywhere successful. The success which has attended the laying-down of the deep-sea cable, from Barcelona to Minorca, for the Spanish Government, and the Algerian one for the French Government, will doubtless do much to revive public confidence in the ultimate and universal success of ocean telegraphy.

AN EXHIBITION OF THE SOCIETY OF ARTS.

It is universally acknowledged that the Society of Arts has conferred invaluable and lasting benefits upon the manufacturing industry of Great Britain. To this society the world is chiefly indebted for the Great Exhibition of 1851, and lately it has given birth to the Exhibition of 1862. Its name is known, and its influence is felt, in every corner of the British Empire, and amongst all civilized nations. Its deeds, therefore, should be worthy of its high reputation, and bear some proportion to the greatness of the objects which it proposes to attain. Is its present annual exhibition of patented inventions of this character? If an educated foreigner, a French or American manufacturer, were led into the society's exhibition-room, and asked his opinion regarding the Society of Arts and the progress of British industry during the past year, what would he say? First he might insinuate that the atmosphere of London is gloomy enough at all seasons, without employing artificial means for increasing the darkness, and would probably request Mr. Hughes to light his musical chandelier to examine the size of the exhibition-room, and the inventions placed before him. He might fairly object to pass any criticisms at all upon things seen imperfectly through a dim religious light. Either the twilight which pervades the building, or the novelties which are supposed to be visible through it, are out of place, and the supposed visitor would naturally either exclaim, “What an excellent place for an exhibition of antiquities!” or he would say, “Is it reasonable to suppose that any wise man would attempt to show a new invention in the midst of such obscurity?” But this is the way in which such exhibitions are made in England; the light may be good enough for the things shown, and, for the present, let us be content with it.

Turning next to the size of the room, and the number and variety of articles in it, the visitor will ask, “Is this intended to be a true and perfect picture of human progress in industry and art during the past year? or is it a caricature?” What do the