ENGLISH AND FOREIGN ORDNANCE.

It curiously happens that just when we are engaged in discussing the consequence of the injury to the steel tube of our 35-ton gun, the particulars reach us of a far more serious accident which has befallen a large Krupp gun in Russia. The *Pall Mall Gazette* says :—"To take the English gun first. This gun has been used for the testing of various experimental powders, and for determining how far the service pebble powder is suitable for the very heavy charges now required. That the power is perfectly suitable for charges from 15 lb. or 20 lb. up to 90 lb. or 100 lb. ? That is a question towards the solution of which the experiments with the 35 ton gun have been directed. In the course of those experiments the gun has fired the following rounds :—With an 11 6 inch bore ; 4 rounds with 75 lb., 2 rounds with 100 lb., 16 rounds with 110 lb., 6 rounds with 115 lb.. 6 with 120 lb., and 1 with 130 lb. ; total, 35. After enlargement to a 12-inch bore ; 6 rounds with 100 lb., 13 rounds with 115 lb., 14 rounds with 120 lb. ; 33. Making a total of 68 rounds, composed as follows—4 rounds 75lb., 2 rounds 105lbs., 22 rounds 110lb., 19 rounds 115lb., 20 rounds 120lb., 1 round 130lb. The shot in each case weighed 700lb. The amount of powder consumed is thus 7635lb., or about 3¼tons. The weight of shot fired is 47,600lb., or over 21tons. At this point the gun was subjected by one round to the extraordinary internal pressure of 66 tons to the square inch. What happened ? The steel tube registered by a small crack the fact that it had been subjected to a strain greater than it could bear ; but the gun did not become unserviceable. It may be fired again and again with its injured steel tube ; or the split tube can be replaced with a sound one, and the gun will be as good as ever again. It is scarcely possible for a piece of ordnance to behave better than this gun has done. If you put upon metal of any description a heavier strain than it is calculated to bear, it must yield. The important point in the case of a gun is that it should not yield explosively—that it should give warning and admit of repair or renewal This is what the English gun has done, and this behaviour is characteristic of that English system of gun-building which Sir William Armstrong was the first to teach us how to apply.

"To turn to the Krupp gun. On the 29th September last an 11-inch steel Krupp gun exploded at Cronstadt at the first round when fired with a charge of 90.92 lb. English (or 100lb, Russian,) and a shot of 496. 54lb. English (or 550lb. Russian.) The muzzle of the gun burst into several pieces, the back part of the gun remaining on the carriage uninjured. Now, there are one or two points in connection with this gun which are worthy of special notice. In the first place, it cost as nearly as possible £6000—the cost of an English gun of the same calibre being about £3000. In the second place, these 11-inch Krupp guns are fully adopted in Russia. In the third place, we are driven to one of two conclusions—either that the Krupp guns are accepted by the Russian Government, and mounted on the works without being proved, or that proof is worthless as an indication of the strength and serviceability of the guns. And with regard to these conclusions we may, perhaps, venture to accept not one but both of them. It is quite in accordance with the whole system under which the Krupp guns obtained a footing in Russia that they should be introduced unproved. The system itself was practically unproved when it was adopted there ; and it is not surprising to find individual guns accepted on the same terms. And perhaps the Russian artillery officers have a suspicion that in the case of a steel gun no proof is of very much avail. They probably know—though they would perhaps be indisposed to admit at how great a cost they have acquired the knowledge—that an essential feature and radical fault of steel is in its uncertainty. The whole history of gunmaking abounds with examples of this. And therefore it may easily be understood that to test a gun which may resist one or two rounds triumphantly and explode at the third, is deemed superflous by those who have had experience with weapons of this material. And in view of this disastrous failure of one of the largest and most costly of the service Krupp guns—a gun embodying all the most recent improvements of construction, and confidentially recommended. just as the unhooped Krupp guns, which have since been abandoned, were confidently recommended in their day—in view of this failure, what becomes of the theory upon which one of the most eager partisans of the Krupp system (Captain von Dopplemair) has based his advocacy of those weapons? 'Ex uno disce omnes.' says Captain von Dopplemair. 'From the trial of one specimen (of steel guns) a judgment can be formed as to all guns of this description. Is this so ? If so, the heavy artillery of Russia must be in a thoroughly unsatisfactory condition. The failure of this gun has created the liveliest excitement among artillerists in Russia ;and the *Journal of St. Petersburg* contains an article from the pen. apparently, of Colonel Kolokolzoff, the superintendent of the Alexanderoffsky Factory. From that article we learn that the committee appointed to examine the gun, attributed the failure to 'a defect in the metal near to the muzzle.' If we accept this conclusion—and there is no reason why we should reject it—we are obliged to fall back on the question we have asked before. What is the proof worth to which these guns are subjected ? or are they subjected to no proof at all? Are they received on the Dopplemair theory ? Is one gun of a batch proved, and no more.

"It is worth while to observe that the failure in both the guns—English and Russian—has incurred in the steel part. In the case of the English gun no reproach attaches to the steel, which has been subjected to excessive strains. In the case of the Krupp gun the steel seems to be open to the reproach of having been defective, as the gun yielded at a strain far below what it should be capable of sustaining. This difference is characteristic of steel—thoroughly good and strong, and resisting in one gun, utterly worthless and unsafe in another. But there is another point to note. In the English gun the injury was at once arrested on reaching the wrought-iron coils, in which the strength of the gun resides. The Krupp gun having no wrought iron coils, the injury was not checked, but proceeded instantly from the interior to the exterior. Lastly while the English gun gave warning of its condition, the Krupp gun gave none. There are no new features in this behaviour of the two guns. On the contrary, all the features are old they have been repeated over and over again. Only we are frequently been told such great things of the steel guns, or to the disparagement of our own, that is worth while when an opportunity occurs to compare the behaviour of the two in order that the public may be able to form their own opinton on the subject."—*Broad Arrow.*

TORPEDOES.

One thousand three hundred torpedo cases, which have been manufactured by Messrs. Spencelagh and Archer, of Rochester, for Her Majesty's Government, have been delivered into store at the Royal Arsenal, Woolwich and testified by hydraulic pressure, for the purpose of ascertaining that they are perfectly water tight. They are simple wrought iron cylindrical boxes, with rounded ends, one of which contains a cast iron cap, pierced to receive the electric wires that screws into the substance of the torpedoe. The cases are surrounded by stout bands, with eyes in them at intervals, to be attached to mooring ropes. Three sizes have been manufactured, one to contain 500lb. of gun cotton, at a cost of £7 3s; another to contain 250lb., at a cost of £5 6s. and a third, to contain 100lb. at a cost of £4 4s. The gun cotton (compressed) to fill them will cost about £37,500 at the rate of 2s. per lb. The two larger sizes as are made of 3-16th of iron plate, the smaller ⅛, but the latter have been tinned to prevent oxidation. Wooden jackets to render these torpedoes buoyant in water are being manufactured in the Royal Laboratory Department. They will be fired by electricity, either by a direct wire from the ordinary galvanic battery placed at some convenient spot in the vicinity, or through the agency of a "circuit-closer," which is a small pear-shaped instrument floating upon the water, and the slightest percussion upon which, such as a blow from a passing vessel, closes the connection between a wire leading to the torpedo moored below and another wire communicating with the battery. Thousands of these "circuit closers" are now in process of manufacture at the Royal Laboratory. The flame to fire the charge within the torpedo is created by an "Able's electric fuze," which is contained within the torpedo itself. The India rubber and Gutta Percha Company are supplying upwards of five hundred miles of electrict insulated wire as fast as it can be manufactured, which is coiled within the ample circumference of one of the dry docks in Woolwich dockyard. They have also instructions for the supply of 1,300 Walker's Galvanic Batteries. A large portion of the wire mooring ropes for the above torpedoes has been received, and the Torpedo Committee, under the direction of Colonel Nugent R. E., are providing all other necessary small stores, &c., for the purpose of rendering them complete in every respect. The gun cotton for charging them was also in course of manufacture at Stowmarket, previous to the disastrous explosion which occurred there, an arrrangement having been made for the preparation of about £30,000 worth of that article ; it is anticipated. however, that means will now be adopted to procure a supply elsewhere.

Moncrieff's 9-inch counterweight gun carriage is to be tested again in England with several tons of lead added to the eighteen tons of iron, of which the counter-weight at present consists ; the platform being raised four inches by blocks of wrought iron to accommodate the increased bulk of metal. The Scott gun carriage for the *Devastation's* 35-ton, is still at the Woolwich butts, being used, for experiment with different natures of powder, undergoing a test which is not likely to be exceeded on service. The ponderous weapon is reported to be under as complete control, and worked by as few men, as the old 5 ton gun of smooth-bore memory, which not ten years ago, was declared to be the heaviest gun capable of being worked on shipboard.