

many has got quite a fleet of those little serpents, and no doubt she is encouraged to place dependence on them, from the fact that through want of knowledge and other causes she managed to keep the magnificent French fleet at bay during the late war. We give below two articles, the first from the *U. S. Army and Navy Gazette*, the other from *Broad Arrow*, as the latest on this subject—but our own opinion that it will be found worthless unless under exceptional contingencies which no thorough seaman will allow to arise:

"A paper recently read by Commodore Parker, at the United States Naval Institute bears," says the *Pall Mall Gazette*, "indirectly strong testimony to the fact that the German leading idea on torpedo warfare, the use of low, light boats specially built to carry these engines, is more suited to the purpose than the fitting of large steamers of an ordinary type with torpedo outriggers, as has been proposed in this country as well as in America. The commodore discussed freely the experiments made last autumn by the fleet assembled on the Florida coast under Admiral Case, and declared that such vessels as the *Wabash*, *Franklin*, *Colorado*, and other old wooden frigates, 'looked warlike and formidable with their powerful batteries as artillery ships, but their booms rigged out for torpedoes were simply ridiculous.' As to the argument used to favour the practice in the official report, that these ships might surprise and destroy vessels of superior strength at anchor by this means, the commodore points out that men-of-war cannot be surprised by large bodies moving slowly, and that in any such warfare the advantage would lie with the defence, the vessel anchored being able to surround herself with a cordon of floating torpedoes, or of torpedo boats, certain to arrest any large assailant. 'The proper way,' he concludes, 'to attack vessels lying at anchor is with small boats fitted with torpedoes, as Cushing did the *Albatross*.' It is in this rule for 'vessels lying at anchor' he read blocking fleets, and for 'small boats' small steamers, the commodore's view may be taken as exactly approving the construction of the experimental squadron now being built for German use in the Baltic and North Sea ports."

"On Saturday afternoon a number of literary and scientific gentlemen started from the Temple Pier, on board one of Messrs. Yarrow and Hedley's swift steam launches, to inspect a high speed steamboat built by that eminent firm, at Poplar, for the Argentine Republic. The *Standard* recalls that about four months ago the same firm drew public attention to another naval novelty in the shape of a steamer intended for inland navigation, the draught of which was only six inches, whilst it was capable of conveying a cargo of thirty tons. There were not a few then who doubted the possibility of such a performance; but we are assured that the little boat is now doing a thriving trade in the Brazilian rivers. About a mile below Greenwich, in that reach of the river where, some months ago, the *Independenzia* was so near coming to grief, Messrs. Yarrow and Hedley's guests came in sight of a small but suspicious-looking craft, long and slim, with a raking funnel amidships and a top heavy bowsprit, along which ran mysterious wires, protruding from her bows. This was the torpedo launch which the company had come to see: As the constructor very well observed, in showing his company over the

vessel, the importance of torpedoes as a means of defence was daily attracting more and more attention. Numerous systems had been tried—each, of course, suited to the conditions under which it was placed. The present invention, in which the torpedo is carried at the end of a pole projecting from the bow, is intended for sudden attack or for chasing the enemy. The torpedo pole, with the torpedo secured at the end, is lowered at will under the surface of the water when the boat is going into action, and the moment it comes into contact with the side of the enemy's ship the explosion takes place. Of course the intensity and consequent results of the explosion depend upon the composition of the torpedo and its size: but one important fact connected with it is that as the explosion occurs at the instant of actual contact with the 'skin' of the ship, the effect is far greater than if any intervening space of water existed. It is said to have been found that for usual charges, if the explosion takes place 10ft. below the surface of the water whilst the pole projects some 25ft. from the bows, no danger need be apprehended to the launch, if well-built and skilfully handled. In the present case the torpedo is exploded not by percussion but by electricity, and as the electric circuit is completed by contact with the enemy, the advantage of the percussion system in causing explosion at the exact moment is obtained, whilst at the same time the galvanic battery placed in the launch can be connected or disconnected at pleasure. In going into action the crew are protected from rifle shots by suitable sliding shields of steel. The present launch is 55ft. in length by 7ft. beam, and built throughout of Lowmoor iron and steel. She is partially decked, and propelled by a pair of high-pressure engines, indicating 60-horse power, and can attain such a speed as to accomplish a continuous run of seventy miles in five hours. Her builders state too, that they are prepared to construct launches for torpedo service of 100 feet long with the extraordinary speed of twenty five miles an hour. At the close of the very elegant *déjeuner*, which was by no means the least enjoyable part of the day's delights, given in the Ship Hotel, Greenwich, Captain McEvoy, of the London Ordnance Works, from whose designs the torpedo gear has been constructed, explained that the torpedo itself was made of stout copper capable of containing 66lb. of dynamite gun cotton (equal to 300lb. of gunpowder) or other explosive. It was arranged to fire electrically, both by contact and at will. The front part of the torpedo was fitted with a contact circuit closer, two insulated wires, which passed through the charge in the torpedo, in connection with the battery in the boat. The electric platinum fuse was attached to the return wire in the centre of the torpedo charge: and an extra wire was attached to the return wire a little forward of the fuse. This wire was also connected with the battery, and had attached to it a hand circuit-closer for firing at will, both the contact and hand circuit-closers acting on the same fuse. The hand circuit-closer consists of a small ebonite cylinder with a spring, which only needs to be pressed down in order to effect an explosion, the result of which would be to blow a hole five feet square in a ship sheathed in one-inch iron.—*Broad Arrow*.

*Broad Arrow* of 13th March gives us the following paragraph:

"Admiral Popoff's speech on the Russian Navy is of remarkable interest, and is ex-

ceptionally remarkable. Its outspoken character is one of its chief merits, throwing as it does considerable light on Russian naval policy. Allowing for the very natural impulse, in reading such a speech, to "read between the lines," it is difficult to regard it in any other light than as a genuine exposition of the policy of Russia in naval matters. After recounting the historical incidents of the last quarter of a century, in which the Crimean war presents the strongest feature, he assumes that there is no possibility of concealing the fact that Russia is always open to be attacked by a combination of naval Powers; that as to attempt to guard against such a possibility, or to provide against it were it attempted, is futile, he comes to the conclusion that a defensive navy is all that Russia can afford to maintain, or can be justified in keeping up. From such a conclusion, to the *Popoffka*, is a very easy and natural step. These powerful vessels, which take their name from the gallant admiral whose opinions we are considering, are designed, as he says, simply for coast defence. They are circular iron-clads, and from their peculiar form and heavy construction have already attracted especial attention. The admiral's opinion is that "round vessels, with the same draught of water, the same thickness of armour, and the same weight of guns, have less displacement of water than vessels of the ordinary form," and that this fact of reduced displacement makes their construction economical. One great advantage in their construction is that their circular form gives them exceptional breadth, and enables them to carry heavier guns than ordinary turret ships. We have had these ironclads long under our notice, but have not thought fit to adopt them. Indeed they have, we believe, been condemned by the Admiralty, who determined on constructing the *Inflexible* instead. This remarkable vessel is being built to carry 80 ton guns, and thicker armour than any vessel afloat. But its construction is costly, and should the Russian *Popoffka* prove seaworthy and easily manageable, their reduced cost, as well as their light draught, will be strong arguments in their favour."

The vessels alluded to are circular, and therefore will present at once the full midship section which we believe would be about 80 feet to resistance of water—when in motion—as this is one half as much more as our largest ironclad. Now as the resistance which water offers to a body moving through it is as the square of the velocity of motion, all other dimensions being equal, it follows that in no case can the circular battery attain a velocity equal to more than one-half that acquired by our largest ironclad vessels, say the *Devastation* for instance, and as speed is an essential element in sea going vessels of war, it follows that, although the *Popoffka* may be an efficient floating battery, it would be entirely useless as a war ship. Its value as a floating battery is doubtful; but with Russia as with other more civilised powers the value of a good *bogie* is well understood.

We understand that His Excellency the Governor General and family intend sailing for Europe on Saturday 24th inst., Dr. Grant we believe will accompany His Excellency as family physician.