

attention. A quarrel with Germany, in which she would appear as the ally of France, would be productive of grave consequences to Italy, and would end in securing the supremacy of the Baltic.

If the policy of England does not expel a greater change she will be neutral in such a contest, and therefore Italy would have to meet the French fleets, the Black Sea Russian fleet, and probably the Austrian single handed.

The maritimestrength of all those powers is given in the following extract:

"A German paper observes that, notwithstanding the efforts made of late years by the Admiralty at Berlin to strengthen the German Navy, it is still much smaller than the navies of most other maritime States. The ironclad fleet of Germany consists of 3 frigates and 2 smaller vessels, with 59 guns; while even little Denmark has 3 frigates and 3 floating batteries, with 65 guns; and Holland has 5 turret ships, a floating battery, 10 monitors, and 2 gunboats, with 60 guns. Italy's ironclad fleet consists of 21 ships, including 12 frigates, a turret-ship, and a corvette, with 208 guns. Austria has 11 ships, with 182 guns; Turkey, 19 ships; and Brazil, 15. Russia's ironclad fleet on the Baltic consists of 25 ships with 160 guns; France has 62 ironclads, with upwards of 400 guns; and England 46 ironclads, with upwards of 320 guns. America has 51 ironclads, but they are mostly small vessels, and her ironclad fleet carries 48 guns. Even Spain has seven ironclads, with 145 guns. It is true that six more ironclads are now being built for the German Navy; but when these are completed Germany will still be far behind the other great Powers as regards the strength of her fleet, especially as four out of the five ironclads which she now possesses are covered with plates of from 4½ inch to 5 inch only, while the recent improvements in artillery render it necessary to have plates of at least 7 inches. The artillery equipment of the German fleet is very strong, but it is surpassed as regards calibre by that of the English and French navies, while Russia has already obtained naval guns similar to those used in Germany, and Austria and Italy are preparing to follow her example."—*Pall Mall Gazette*.

France has also 264 screw steamers, 62 paddle steamers, and 113 sailing vessels, mounting respectively 1,547, 154, and 679 guns, making a fleet of 401 vessels armed with 3,045 guns.

Italy has also 29 screw steamers, 32 paddle steamers, and 8 sailing vessels, respectively of 380, 113, and 104 guns—A total of 91 vessels mounting 798 guns.

The French fleet is manned by 74,403 officers and seamen, the Italian by 19,088. Comment is useless, and it would be evidently the true policy to develop the naval power of the Peninsula.

*Broad Arrow* reviews a pamphlet by Lieut. J. T. BUCKNILL, R. E., entitled "Torpedoes vs Heavy Artillery," in which that enterprising officer assumes that Torpedoes properly disposed, supported by batteries of what he calls light guns (six and an half tons) would be the proper armament for coast defence.

Admitting the possibility of using such a combination there are certain conditions under which the main agent of defence "the Torpedo" must be used which should be considered.

Torpedoes must be operated as floating, impact, or electrically—the first being managed by clock-work time-fuze or other contrivance—the second ignited by being struck by a vessel and consequently must be anchored—the third must be fired from the shore by the electric battery and wires.

It would appear that the only actual experience yet acquired (barring always Capt. WARNER's) has been derived from the late Confederate States during the civil war—and it is decidedly against the system of ignition by electricity. If anchored in a roadway or off a harbour their sites will be easily determined, and they may be removed or avoided; as their greatest advocates does not claim a greater effective range for their power than a radius of 40 feet. Moreover where there is any appreciable rise or fall of the tide, a submerged Torpedo is subjected to displacement in a much greater degree than if it floated as a buoy, and those acting by impact are as dangerous to friends as foes, while the floating machines are not reliable or valuable.

It would appear therefore that Torpedoes will be of little use in coast defence except behind a boom or barricade and under the guns of a powerful battery which will not be limited to guns of six or seven tons, but equal in power to anything which can be brought against them at least.

The only known successful use of Torpedoes, as defensive weapons, was behind a barrier and under the conditions described. Their only successful operations, with one exception, was against ships at anchor.

Lieut. BUCKNILL states that he has just "been six weeks in the United States, and found that three special torpedo vessels were commenced, whose speed, it is hoped, will attain seventeen knots per hour; that ten powerful steam-tugs were fitted with telescopic outrigger torpedoes, to be worked from the interior; that the monitors, about thirty in all, were fitted with boom torpedoes; that every vessel, whether corvette, frigate, or gunboat, in the United States Navy carried a number of outrigger and towing torpedoes, to be worked from the vessel itself; that the officers of the Navy were being thoroughly instructed, in classes of twenty at a time, in the art of practical torpedoing, the course of instruction lasting several months"; and "that many of the most experienced officers in the United States Navy believe that the torpedo is to be the principal weapon of future naval armaments."

The United States *Army and Navy Journal* while taking all the credit possible for foresight and enterprise in this matter, says—"The great fact however that should be noted here is the admission that the buoyed or fixed or floating torpedo, whether dischar-

ged by circuit contact or shock of impact is not yet the culmination of submarine defensive art. It is confessed that however well these infernal engines may be disposed, and with whatever security of discharge, invention has found a way to destroy them before they can become dangerous, or at least isolate them from their directing power."

Captain HARVEY states that he can tow them at a considerable angle from the operating vessel's wake at a distance of about one hundred yards, and at a very high speed. We do not question the gallant officer's accuracy, and there is hardly a limit to invention, but we have seen the *fishing otter* and are not prepared to give implicit credence to its manageability at any speed like that which will be used in action. The very fact of the speed will expose its position, and a vessel keeping a luff of 120 yards from her opponent, can avoid the painfully elaborated trap.

Captain COLONN in his "attack and defence of fleets" states that future Naval actions whether fought in *line ahead* or other disposition will be "fought end on," in which case the question will be between the torpedo with 60 lbs. of gun cotton at 340 feet or a 600 lb. shot or shell at 360 feet, the great chance would be decidedly in favor of the latter.

The *Army and Navy Journal* states on the authority of an United States officer of rank and experience, "that the British Admiralty possessed a more comprehensive knowledge of submarine invention and progress than any similar official body in the world." And the limited use made of that knowledge justifies the conclusion that the Torpedo is not what it is claimed to be by its admirers.

As the whole of this question is debated with reference to its application as an armament for the floating batteries which mechanical ingenuity without scientific skill has substituted for the British fleet, and as the attempt to arm them with heavy artillery has been a disgraceful failure, we cannot forbear giving the words of a Naval officer of some distinction relating to the controversy.

At a recent meeting of the "Royal United Service Institution" Major STOTHERD read a paper on submarine Mines, Commander DAWSON, R. N., said—

"At this moment, the British fleet is the only considerable one in the world whose officers never practice the applications of offensive torpedoes. At this moment the American squadron in the Mediterranean is furnished with and practices with such torpedoes while our fleet has not a chance of acquiring similar experience. True, *military* submarine mining is taught to naval officers, as if we already anticipated the British fleet being shut up in our harbors and its seamen attached to the corps of Royal Engineers for defensive purposes. Let us then, add to the British fleet *Monarchs*, *Devastations*, *Glattons*, and *Thunders*, armed with 25 ton and 35-ton guns, which have never been subjected to rapid continuous firing, and which naval men believe will, as at present rifled, contrary to all mechanical principles, break down under such an ordeal. Arm the fleet with such