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THE TORPEDO SCARE.

[TO THE EDITOR OF BLACKWOOD'S MAGAZINE.]

SIR.—If I presume to endeavour to stem the tide of public opinion as regards the very great efficacy of the fish-torpedo as a weapon of maritime warfare, it is not with any confidence in my powers of persuasion, or for the pleasure of controversy, but because I am perhaps the only person living who has commanded squadrons or single ships in war, where torpedoes were used as *offensive* weapons—I am, yours truly,

HOBART PACHA.]

DURING the late Turco-Russian war, Russian torpedo-boats constantly attacked Turkish ships. These attacks were made not only by boats armed with the Pole and Harvey torpedo, but with the newest type of the Whitehead torpedo then invented. They were commanded by as active and gallant a set of men as ever stepped a ship's deck, and who made every possible effort to destroy Turkish ironclads, every one of which returned safely to Constantinople after the war. The only loss to the Turkish squadron was two small wooden gun-boats blown up *in the Danube* through the carelessness of their commanders.

I venture to maintain that the power of the torpedo, as a weapon

of offence as well as of defence, is enormously exaggerated. Were it not so, one might almost say that naval warfare would soon come to an end altogether, inasmuch as no fleet or ship could resist such a deadly weapon. Blockade of an enemy's port could not be maintained. Vessels could never lie at anchor so near an enemy's coast. Fleets could not cruise in the neighbourhood of hostile ships carrying torpedo-boats. Ports defended by torpedoes could not be attacked, harbours and estuaries could not be approached; and, in fact, none of the old systems of naval warfare could be put into execution. The courage of naval officers, their coolness in time of action, their seamanlike qualities,

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of which some nations are so justly proud, would be put to a test in a manner altogether different from what has hitherto taken place. The sailor, although brave and cool in a fair fight, would be in constant dread of being hurled into the air, without even the chance of striking a blow or firing a shot in self-defence. The writer of this, while commanding squadrons manned by men who have not only the unsurpassed courage of their race, but who have recourse when in danger to the almighty word *kismet*, and only think of danger *after* its arrival—had only his own humble idea of courage without *kismet*, and thus felt all the anxiety day and night, for nearly a year, of not knowing at what moment he might receive the happy despatch by being blown into the air.

The Russians had, very shortly after I had anchored my squadron in Batoum, launched several torpedoes at the ships, in spite of my having placed guard-boats across the entrance of the harbour. One of these torpedoes struck the chain of the flag-ship, and went on shore unexploded; another struck on the armoured belt of a corvette and exploded, but the blow being at an angle, it did no material injury. After this experience, it was absolutely incumbent on me to take some steps for the safety of the vessels under my command. The means in my power for torpedo defence were unfortunately very limited, but that very fact enabled me to prove that necessity is the mother of invention. For example, the system which I had seen adopted with regard to hostile fleets in torpedo defence, comprised a system of *éclairage* which it was entirely out of my power to employ. Thus, instead of lighting my ship, whereby I should have become a target for the ene-

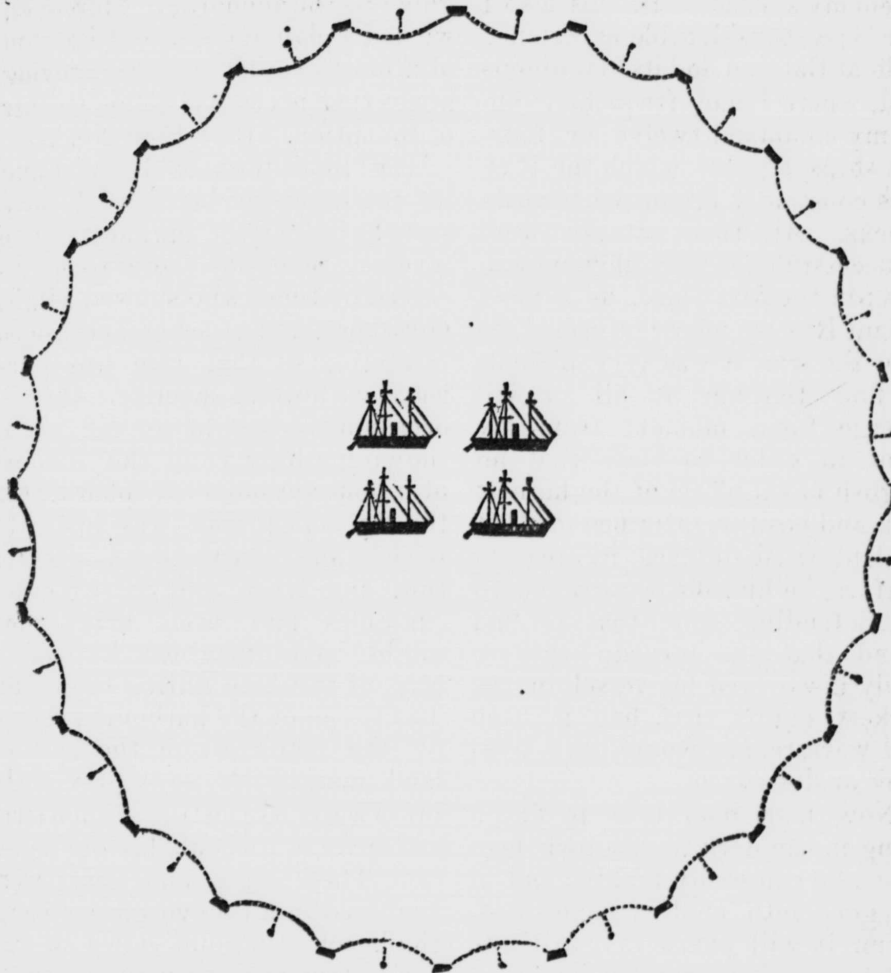
my, I from force of circumstances, was obliged to maintain what was in reality the far better system of utter darkness from sunset to daylight. But of this hereafter.

I will now relate in detail the plan I applied as a defence in regard to the different points mentioned above—namely, the course to be adopted for the safety of ships of war while blockading an enemy's port, while lying at anchor near an enemy's coast, or while cruising in the neighbourhood of hostile ships blockading. I think that the ships should be always, when convenient, under way, and with their torpedo-nets out, constantly changing their positions so as not to be easily found by the enemy's torpedo-boats: no lights whatever should be shown. Should it be necessary to anchor, I think that the ships should be anchored in small detachments, and a system of defence arranged as follows, placed round each ship or detachment. (See Plan No. 1.)

By this it will be seen that boats at a distance of 400 or 500 yards will be placed round the squadron at anchor. These boats will be connected together by wire-ropes immersed about two feet in the water, and buoyed in the centre. The object of this is to catch the screw of any attacking torpedo-boat. It has been proved that common rope, used for want of anything better, has effectually checked the career and capsized an attacking torpedo-boat in her attempt to destroy a Turkish ship in the Black Sea during the last war; and I know that most satisfactory experiments with the wire-rope have been made elsewhere. The result of these experiments was that a torpedo-boat, steaming 19 miles an hour, has capsized while dashing full speed on to an imaginary enemy's ship.

## PLAN NO. 1.

The wire-rope between the boats is sunk sufficiently to catch the screw of the torpedo-boat, and buoyed half-way between the boats to prevent its sinking more than necessary.



*N.B.*—The 4 vessels are 120 yards long. The two pairs, breadthways, are 50 yards apart. There are 24 boats, each 8 to 9 yards long; and the 24 spaces between the boats are 54 yards each. The radius of the circle described by the boats is 550 yards, which keeps them 400 yards from the ships.

It seems to me that this system, carefully applied, would prove a most efficient and thorough defence against torpedo attack. I am aware that the present torpedoes are fitted with screws so sharply edged that they would cut through any rope placed to stop them. With the wire-rope this would be impossible. This system of defence would apply to single ships at anchor in the same way as it would apply to a squadron or to a detachment, and I see no reason why a larger number of ships than I have shown on the plan should not be protected in a similar way—the only question being, that the radius would have to be increased according to the number of ships, which might prove, if overdone, inconvenient, if not impossible. Objections might be made that in bad weather boats could not keep their

positions. I have had ample proof that in bad weather torpedo-boats cannot fire with any accuracy. It therefore tells both ways.

Now as to lying at anchor near an enemy's coast. In this also I have had considerable experience while at Batoum and its neighbourhood, where I had frequently under my command twelve or fourteen ships, against which the Russians constantly organized torpedo attacks. All their attacks were unsuccessful, for the following reasons: in the first place, as a most gallant Russian officer informed me after the war, it was very difficult to find Batoum at all. I will diverge for a moment from my point in order to state that an English naval officer of the highest rank and position informed me that he had tried defence in torpedo warfare, he himself being on board the defending ship, that he had found that the torpedo-boats so easily discovered his vessel in the darkest nights, that, had it been real warfare, she would have been sunk or destroyed.

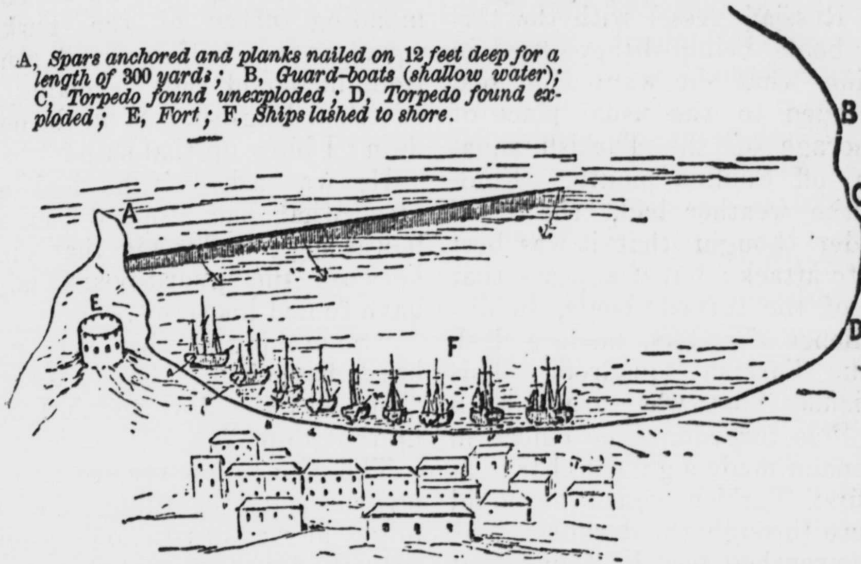
Now if a man tries to find a thing in the dark in his own bedroom, he can easily find it; but if he goes into another man's bedroom, it will puzzle him vastly to put his hands upon what he wants. I make this comparison because I imagine that the attacking torpedo-boats referred to by this gallant officer came from the immediate neighbourhood, and knew pretty well where the object of their attack was lying—knew the bearings and distance before they started to attack her, and thus had very little difficulty in finding their way. The attacks by the Russian ships on the Turkish squadrons were generally made from vessels coming from ports 200 to 300 miles off, and which, on a pitch-dark night had to find a harbour where there

were no marks or lights of any description. Nothing could be seen beyond the dark outline of the high mountains behind the harbour, which were next to useless as a guide to the anchorage. Moreover, we had a plan of defence at Batoum of a most original nature, proving again that necessity is the mother of invention. (See Plan No. 2.)

The little port of Batoum and its towns were kept, as I have stated, in perfect darkness. The severest penalties were to be incurred by those who showed a light anywhere, and on several occasions infraction of that rule was punished with great severity. On one occasion we caught an old rascal showing a light from the window of a house prominently placed near the sea. The man was instantly seized and bastinadoed. After this, and when one or two other examples had been made, one might have imagined Batoum a city of the dead during the night. The shape of the harbour is shown by the plan. From the spit of land marked A we improvised a breakwater, consisting of such trees and spars as we could lay our hands on. These trees and spars were anchored in a line verging towards the beach at a point called B. To these trees were nailed numbers of thin planks abreast straight down into the water—so making, as it were, a wall of planks about 12 feet deep. The proof of their efficacy was shown one morning by our finding a hole in the planks, and a torpedo diverged from its course lying on the beach at the point marked C. This torpedo had not exploded, and, when discovered by the guard-boats, was surrounded by gaping inhabitants who, in their astonishment, looked upon this unusual apparition as if it were a huge fish still alive and moving his tail—that tail being,

## PLAN NO. 2.—HARBOUR OF BATOUM.

A, Spars anchored and planks nailed on 12 feet deep for a length of 300 yards; B, Guard-boats (shallow water); C, Torpedo found unexploded; D, Torpedo found exploded; E, Fort; F, Ships lashed to shore.



in fact, the screw, which was still in motion. This proved that, as we had anticipated, the direction of the torpedo had been changed on coming into contact with the planks; and instead of going among the ships at anchor, as was intended, it had gone ashore. I think this experience exceedingly interesting, as it shows that very little will turn the direction of a fish-torpedo.

On several other occasions attacks were made by torpedo-boats on the ships in the port of Batoum, without any result, beyond a loss to the Russians of three or four torpedoes, which were landed on different parts of the beach, near to which the Turkish men-of-war were lying at anchor. Some of these torpedoes were in such a state of perfection, that Mr Whitehead the inventor, knowing that we had by their capture become the possessor of his secret, made a special contract with the Turkish Government, whereby he was bound to give twenty-five torpedoes at cost price, and wherein it was agreed that the Ottoman Admiralty were to pay

nothing for the secret (for which other Governments were paying from £12,000 to £15,000) so long as they kept it.

I shall now mention a curious incident which happened to a Turkish squadron lying at anchor and protected by guard-boats, placed somewhat in the manner I have already described. I wish my readers always to remember that the appliances against torpedoes in the Turkish fleet were of the simplest possible description. The squadron consisted of five vessels, which had been in the habit of cruising every night to avoid torpedo attack. On this occasion they had, in consequence of the bad weather, returned to their anchorage. A Russian vessel, carrying five torpedo-boats in tow, started from Odessa to hunt for the Turkish squadron, who were supposed to be cruising off Serpent Island, about 80 miles from Odessa. The Muscovites were unable to find their enemy, and I don't wonder at it, for even had they been cruising off that night, the Ottoman ships used

smokeless coal, sailing in open order for safety against collisions, and without showing any lights. The Russian vessel with the torpedo-boats being disappointed in finding what she wanted at sea, proceeded to the usual place of anchorage of the Turkish squadron off Soulina mouth. Finding the weather bad, the commander thought that it was best not to attack; but it appears that one of the torpedo-boats, in disobedience of orders, made a dash at the Turkish squadron. This particular boat was armed with the Pole torpedo. The officer in command made a gallant charge at the first Turkish vessel he could discern through the darkness. As he approached her, he found that *something* all of a sudden stopped his way; he saw several black objects approaching him. Nothing daunted, he struggled to get alongside the vessel under her bows. Finding that he could not succeed in getting quite close, he, in despair, discharged his torpedo, but without doing any harm whatever to the Turkish ship at which he directed it. Scarcely had he done so when (as he described his own sensations afterwards) he found himself in the water without knowing by what process he had got there, or how in the world it had all happened—the real facts being that the black objects he saw were the guard-boats, which were being drawn closer and closer to him by the ropes that connected them together, which ropes fouling his screw had been the cause of the disaster. His boat was capsized and went to the bottom, whither he would have gone too if he had not been fished out by the crew of one of the Turkish guard-boats and taken prisoner. The greater part of his crew were drowned. The name of this dar-

ing young officer was Putskin; and his cool courage was very amusing, for when brought before the commanding officer of the Turkish squadron in a half-drowned condition, he could only exclaim, in excellent English, "Why the devil didn't I blow up that ship!"

He was asked if he had any idea what had stopped him, and it was suggested to him that a rope between the guard-boats might have fouled his screw.

"Something of that sort must have happened," he answered. "But why the devil didn't I blow up that ship!"

The poor fellow seemed to have no thought regarding the sad plight he was in: he only grieved for not having succeeded in carrying out his object.

He explained to me that the other torpedo-boats which started with him were all armed with the Whitehead torpedo, but that *it was impossible to use it in bad weather*. The Pole torpedo might have done the deed he was so anxious to perform, and with it he might have succeeded in "blowing up that ship." He was too plucky a fellow to be allowed to go back to the enemy, so we kept him a prisoner till the conclusion of the war: and I only hoped that, for its own sake, the Russian Admiralty did not lose sight of such a dashing and determined officer.

While writing on incidents of the war, I will mention another interesting occurrence. A Turkish ironclad was lying off Soukoun Kali. That place being an open roadstead, she was very much exposed, and an excellent object for torpedo attack. A fast Russian cruiser was always hovering about, but the cordon of guard-boats connected by ropes prevented her torpedo-boat from making any attempt. This torpedo-boat was armed with

a Harvey torpedo. One night there was to have been an eclipse of the moon. Now there is a superstition among orientals regarding an eclipse, which caused the look-out to be somewhat relaxed, and the guard-boats to be withdrawn, and nearer the man-of-war than they should have been—in fact, I fear they had gone quite alongside, thinking more of the mysterious eclipse than of their active enemy.

As the eclipse only lasted for about a couple of hours, the steamer carrying the torpedo-boat must have been near in the offing, and should have been seen; although I found, on inquiry, that the system of no lights and no smoke was carried out in the strictest sense by the Russian torpedo-carrying vessel. However, this may be, half an hour after the moon was eclipsed the attack was made by a boat carrying a Harvey torpedo. This boat succeeded in getting so near that she was able to make the circuit necessary for firing her torpedo, and, though attacked by the guard-boats, fired it within ten feet of the Turkish ship. A great explosion and much smoke was the result. The lookers-on on shore telegraphed to Sebastopol that they saw the vessel sink. However, so far from that being the case, I found, on visiting her two or three days afterwards, that, except for a slight mark on her side close to the water's edge, no damage was done. On the vessel's return to Constantinople she was put into dock, when it was found that she had been very slightly damaged; in fact it was not necessary to change any of her outside plates. I think that the manœuvres necessary to make the Harvey torpedo efficacious render it a weapon on which little or no reliance can be placed, unless all

the hands on board the attacked ship are asleep. I would rather trust to the Pole than to the Harvey torpedo, though I do not think that either of them counts for much when a sharp look-out is kept. In my opinion the most useful torpedo is a fixed one, fired either by contact or by electric batteries at a distance, especially when they are used in defence of the approaches to forts, the entrances of harbours, of estuaries, &c. According to general opinion, the perfected Whitehead or Swartzkoff torpedo is the only weapon for active service at sea. Let us examine how they can best be utilised. My opinion is that for attack they are of very doubtful efficacy. I remember on one occasion I followed in a very fast frigate (my flag-ship) the Emperor of Russia's yacht *Livadia* too near to the fire of the forts of Sebastopol. I say too near, because I drew on my ship such a fire, that, had I not "cleared pretty quickly out of that," I should not have been here to-day to tell the story. Since the war, a Russian naval officer, whose name was Captain Makaroff, A.D.C. to H.M. the Emperor of Russia, told me that he had under his command seven torpedo-boats, with which he volunteered to go out—in the daytime it must be remembered—and attack me. We discussed at some length the probable result, and I think that even he admitted that he could have done nothing. Here is my view and argument. I said to him, "When I saw you and your torpedo-boats coming out, I should have run away. Now I could go thirteen or fourteen knots. You could steam about nineteen. Thus your speed following me would have been about five knots—no great speed at which to approach a vessel

armed to the teeth with Nordenfeldt guns—guns *en barbette* firing grape, shrapnel, &c. I am convinced that we should have destroyed all the torpedo-boats; and this, I believe, would be the fate of any day-attack attempted by them.”

“Well, then,” said my friend, “I should have followed and attacked you during the night.”

“There again,” I said, “I think that you would have failed, because if you had been in range of my small guns as well as of shell, say at about 3000 yards, before dark I should have destroyed you. After dark I should have changed my course, and how would you have found me? However, supposing that I had stopped in the night and put down my defences, what could you have done! I don’t think that a ship can be seen so as to be fired at a distance of more than 400 yards on a dark night, and a moving ship would be a still more difficult mark. If a torpedo-boat came nearer than 400 yards, she would have been caught by the line of defence, should I have thought it prudent to stop.” On this point we had a long and somewhat warm discussion, which ended—at least I flattered myself it did—in the Russian officers remarking that really he thought, after all, that he could have done nothing.

I find that naval men have, as a rule, great confidence in a system of defence against torpedoes by means of nets, and I understand that the ingenuity of the age has invented a plan enabling a ship to steam seven or eight knots without any inconvenience from this modern crinoline. For my part, I do not ignore the utility of this system for want of a better; but I hear rumours of torpedoes which will be able to attack ships at a point that cannot be protected by this plan—

namely, under the bottom of the ship, where the protecting net would have no power. But the torpedo, of whatever description, is generally carried in a boat, and if you can manage to catch or destroy the boat, there is an end of the matter.

Now with regard to the power of torpedoes for attacking purposes. I hear it said that during a naval engagement torpedoes can be utilised to a very great extent. In this I am inclined to agree. If torpedoes can accompany squadrons and act independently either against disabled ships or even against ships which might be approached unperceived, there can be no doubt that they would play an important part in a naval engagement. But the difficulty seems to be their remaining constantly at sea in company with a fleet. The French already are drilling their torpedo-boats to accompany a sea-going squadron; but I have a suspicion that, for different reasons, these boats are constantly obliged to return to port. It must be remembered that a torpedo-boat is built of the lightest material, and is of the finest workmanship. Very little would therefore tend to put her out of order. I have seen a torpedo-boat before a gale, in a gale, and after a gale, at sea; and although I should be sorry to discourage those who have put faith in her capacity as a sea-boat, still I must say that in the last state the boat represented a very dilapidated appearance.

Although it is the fashion for ironclads to be fitted so as they can launch their own torpedoes, I do not think that they would be able to do so with efficiency, for several reasons—the first being, that a torpedo is never sure of being fired with accuracy when projected from a height greater than two or three



feet above the water. In fact it has been proved that to obtain the so-called accuracy at which they profess to have arrived, the torpedo must be fixed as close as possible to the water's edge, and in the boats now in construction the most important element is the close proximity to the water in which the tubes are placed. I myself have seen torpedoes fired from a ship's broadside, and although on one or two occasions they have been launched with considerable accuracy, I have seen one of them immediately after its submersion fly straight up in the air and endanger the safety of the ship from which it had been fired ; so I think that little confidence can be placed, at present, in the efficacy of torpedoes fired from ship's batteries.

There is another essential point as regards the efficacy of sea-going torpedoes during a naval engagement. A torpedo-boat might in the *melee* mistake a friend for an enemy. Again, let us suppose that two ships are hotly engaged, and that one of them succeeds in capturing the other. If the conquering ship neglects to hoist on her prize the flag of her nation, a torpedo-boat coming from a distance, and belonging to the captor's nationality, is as likely as not to blow the prize up. This may be rather far-fetched, but more unlikely things have really happened in naval warfare. Coming naval engagements will be soon decided,—the time would be too short and the confusion too great to allow of any accurate action on the part of torpedo-boats. Independent action would be dangerous. I should suggest that torpedo-boats of a smaller class that can be hoisted up should be carried on board men-of-war. These could be used or not as required, by re-

sponsible captains, who would be capable of forming an opinion as to the time when they should be utilised.

Now one word about offensive torpedo warfare. Torpedo-boats could be sent from blockading squadrons into an enemy's port, and if the enemy's ships were unprepared, could do, no doubt, a vast amount of injury. Further than this, I am at a loss to perceive how they can be utilised.

I have ventured in this paper to throw some doubt upon the great efficacy of the so-called fish-torpedo, inasmuch as I think its danger can be averted. I will now turn to other torpedo inventions, which I think, when perfected, will prove better adapted to naval warfare. It must be remembered that the origin of the torpedo was in America during the great war between the North and South. The torpedo used, although at that time in its infancy, proved itself to be a most deadly weapon of defence. Placed at the mouths of great rivers, in the rivers themselves, and in shoal-water, wherever an enemy was likely to be cruising, it did good service on many occasions. I think I am right when I say that more than fifteen vessels were destroyed by torpedoes during the time that the war lasted. This torpedo was, with some very rare exceptions, used as a mine placed either floating, or at the bottom of the sea or river, and several vessels were thus destroyed while passing over these snares. More than one case of conspicuous daring on the part of the Southern naval officers occurred during the war, while using most effectively what is called the cigar torpedo-boat. This was a craft which, when in motion, was entirely immersed, except the top of the funnel, and might almost be called

a submarine torpedo. I remember on one occasion during the war, when I was at Charleston, meeting in a coffee-room at that place a young naval officer (a Southerner), with whom I got into conversation. He told me that that night he was going to sink a Northern man-of-war which was blockading the port and invited me to see him off. I accompanied him down to his cigar-boat, as he called it, and found that she was a vessel about forty feet long, shaped like a cigar, on the bow of which was placed a torpedo. On his stepping on board with his crew of four men, his boat was immersed till nothing but a small piece of funnel was visible. He moved off into the darkness at no great speed—say at about five miles an hour. The next evening, on visiting the coffee-house, I found my friend sitting quietly smoking his pipe. He told me that he had succeeded in making a hole in the frigate which he had attacked, which vessel could, in fact, be seen lying in shallow water, some seven miles off, careened over to repair damages. But he said that, on the concussion made by firing the torpedo, the water had rushed in through the hatches of his boat, and she had sunk to the bottom. All his men were drowned. He said that he didn't know how he escaped himself, but he fancied that he came up through the hatches, as he found himself floating about, and swam on shore. This affair was officially reported by the American blockading squadron, corroborating the fact of the injury done to the frigate, and stating that the torpedo-boat was got up, with four dead bodies in her hold. Here is one system which might be utilised in naval warfare if perfected, and I am given to understand that a submarine torpedo-

boat is already invented by Mr Nordenfeldt.

In regard to the fixed torpedoes I have already referred to, the admiral commanding the American squadron told me that on one occasion he was steaming in line, his flag-ship being second in the order of sailing, when suddenly the ship ahead of them disappeared altogether, having struck on a mine; and that he found these mines the most deadly enemies to deal with, especially when the water was not very deep. I have seen a clever invention of Colonel Ley tried at Constantinople. This invention which is now being put into shape by Mr Nordenfeldt, struck me as being the weapon of the future, if the present somewhat serious defect—namely, its want of speed and immersion—could be overcome. When I saw it tried, it was steered by electricity, and went very straight for more than a mile. But it was too visible in the water, and only obtained about nine knots' speed, and thus, I think, would have been easily destroyed in the daytime. However, I am given to understand that Mr Nordenfeldt has partially, if not entirely, overcome the above-named defects. If so, he has a good chance of taking a lead in torpedo-manufacture, as he does now in machine-guns. General Berdan also promises great things in torpedoes. If he can do what he professes, he will cut every one out; for he undertakes to give speed, distance, safety against nets and other obstacles, easy steering powers, certainty of direction, &c. I wish him well, but he has been a very long time about it, and so far his trials have shown few satisfactory results.

Now in this paper I have spoken of the fish or Whitehead torpedo, the Harvey, the Pole, the fixed or mine torpedo, the Ley or Nor-

denfeldt, the cigar-boat and the Berdan. I have no doubt that there are other inventions, because the fact remains that the torpedo is not perfect—no, not by any means. When it is so, we had better act like the 'coon up a tree in America, who says to the sportsman, whom he knows to be a dead shot, "Don't shoot—I'll come down;" for war would then be too awful.

As the torpedo scare may extend to merchant-vessels, I will say a few words of consolation on that head. A merchant-vessel need not fear the torpedo-cruiser, because if the vessel carrying the boats which launch that nasty weapon can get near enough for them to use it, she will be near enough to go alongside, for the capture of valuable property is of more importance than its destruction. Moreover, it would be useless to send out torpedo-boats alone to look for prizes. Where could they be sent from? Where would they get coals? And what would they do with the prizes after they had taken them? They cannot carry prize-crews; and to destroy a vessel for the sake of destruction would be a wanton act, which would be universally condemned. Besides, a torpedo is a very expensive article to throw away for the sake of destroying an enemy's merchant-vessel. So I think that the captains and crews of merchant-vessels may breathe freely as far as torpedoes are concerned. It is intended, I understand, to use torpedoes on board regular sea-going vessels of from 300 to 400 tons. This seems to me to be a practicable idea; and should the distance a torpedo can be fired be

increased, these vessels would be serviceable craft; but so long as 400 yards is the maximum distance, they would, unless attacking a craft of their own size, be liable to be knocked to pieces before they could get within torpedo-range of the enemy; and it must be remembered that they would be a much larger target than the torpedo-boats.

One word more. I would ask my naval friends how they would judge distance at night when firing their torpedoes, and how they propose to approach ships guarded with nets and boats? Remember, also, that ships can cruise with their nets down. The fact is, that what frightens people is the great speed at which they see the devilish-looking torpedo-boat dashing by them. They do not take into consideration the damage that great speed would cause to the torpedo-boat itself, in the event of its meeting any obstacle, or being obliged to stop suddenly. For example, a curious case occurred lately on this coast. A torpedo-boat was obliged to stop suddenly, the result being that her machinery came to utter grief, and three men were killed by the fires being thrown out of the furnaces and on to them; and I repeat that a boat fouling a wire-rope was capsized and sunk, through the sudden check of the great impetus through the water. Taking into consideration all the experiences that I have narrated in this paper, I think that I am justified in saying that fish-torpedo warfare is to a great extent a bugbear, and though not to be entirely despised, may be designed as the "naval scare of the day."