

THE DEADLY TORPEDO IN MODERN WARFARE. BOATS AND MISSILES EMPLOYED IN SUCH FIGHTING WATCHED BY THE WHOLE WORLD.

Never did the dramatic contest between David and Goliath, recorded in the Scriptures, have a more striking parallel than that afforded by last week's naval battle at the entrance to Port Arthur. On that occasion big ships were disabled by their own torpedoes, and the Russian little boats, the "Osvyestich" and the "Retvizan" each disabled about 25,000 tons, and the Poltava a little less than 11,000. It is doubtful if the torpedo boats which successfully attacked them displaced more than 300 tons each. If they did that, their vanquished foes were at least thirty times as big.

They had a displacement of only twenty-five or thirty tons, and could have been hoisted up to the deck of a battleship or cruiser, to be taken to a distance, if necessary. Then came a rapid development in proportions. The "Venetian," which represents the influence of that movement, displaced 300 tons. England projected several boats of from 800 to 1,000 tons each. At length, however, a reaction set in, and to-day the limit is about one-quarter or one-third of the latter figure. The Dupont (American) displaces 150 tons, and the Sokol (Russian) 240, while the ill-fated Viper (British) had a displacement of 370 tons.



TORPEDO BOAT DISCHARGING A TORPEDO.

of warfare until now. Japanese torpedo boats at the time sank three Chinese war vessels, the Tsin Yuen, Ching Yuen and Lai Yuen. Since China did not rate as a first-class military power, however, it was not felt that the test was significant. Both the United States and Spain had thoroughly modern torpedo boats in Cuban waters in 1898, but neither of them experimented with the missiles for whose use they were designed. Nothing further was learned, therefore, until last week.

The idea of blowing up an enemy's ship with a charge of powder placed under her is much more than a hundred years old. A Colonial patriot, David Bushnell, proposed thus to destroy a British vessel in New-York Harbor in 1776. Bushnell designed a crude submarine craft for use in that way. Difficulty was experienced by his agent, Ezra Lee, in affixing the torpedo to the ship, however, and she escaped. During the Civil War one or two successful attempts were made by carrying the torpedo out at the end of a spar and igniting it by electricity.

Then came the navigable torpedo. This was a cigar shaped metallic object containing machinery for its propulsion and a charge of some explosive at the front end. In some of the early designs an electric motor drove the screw, the current being supplied through a wire from the shore. This wire could be previously coiled up inside the torpedo and stretched out when the latter was moving. The latter figures indicate the capacity of compressed carbonic acid there, and used it to electrical means, and a deviation from the original course amounting to 20 or 30 degrees was thus made practicable. In the Sims-Eddison design the depth of submergence was regulated by suspending front and rear from a tiny float.

Several inventors proposed to make the torpedo entirely independent of land by supplying motive power of another kind. One man stored a quantity of compressed carbonic acid there, and used it to propel the engine. Another introduced a heavy wheel, to which, just before launching, it was proposed to impart a high rotative velocity by outside mechanism. Fully 10,000 revolutions a minute could be secured. In that way enough power was to be stored to drive the torpedo a few hundred feet. These and other projects were tested more or less extensively by the naval authorities, but it was finally decided that the Whitehead design was the best of all. This employed compressed air to drive the screw, and also had unique mechanism for keeping the torpedo from changing either its direction or level after being launched. The author was a captain in the Austrian navy.

Though the dimensions of Whitehead torpedoes vary somewhat, the standard of the United States is for a diameter of 11 or 12 feet. The explosive charge consists of gunpowder, which is always kept wet, to prevent accident. The weight of the charge employed by different nations is not the same. It rarely falls below 300 pounds or exceeds 500 pounds. The standard for the United States is not long. The standard for the United States was 300 pounds. Only about two years ago a British or German house was making torpedoes for Japan in which the charge was 300 pounds. It is not unlikely that some of these were employed in the recent engagement at Port Arthur. Russia is reported to have favorably considered the adoption of 300 pounds. Directly in front of the war gunnition is a dry "primer" of the same material and a small quantity of fulminate of mercury, which serves as a detonator when it is itself struck sharply by the firing pin. The latter projects from the nose of the torpedo, and it drives in when it hits any solid object.

The compressed air which operates the propelling machinery is supplied under a pressure of 1,000 pounds to the square inch, and the walls of the chamber are tested to stand 1,500 pounds. A few years ago the distance which would be traversed under that impulse was 600 or 800 yards. The best Whitehead torpedoes have a range of nearly or quite 1,000 yards, or over half a mile. If possible, though, they are launched when the torpedo boats are much closer than that to their targets.

As the modern torpedo is self-propelling, it is necessary only to start it on its way with a gentle push. A torpedo tube is a horizontal cylinder, only a little longer than the missile, and shielded at the outer end by a simple valve, designed to keep out water. A gate, or door, at the rear end opens for the admission of the torpedo. A vigorous puff of compressed air effects the launching after the projectile has been aimed by the proper steering of the boat.

Nowadays nearly all the warships have three or four torpedo tubes, but it is doubtful if they will ever be more serviceable. For real work much smaller and much faster craft are needed. The size of torpedo boats has undergone some curious changes. Their original function—theoretically, at least—was coast defense. It was hardly thought that they would ever be employed outside the harbors of the country which owned them. They were meant to resist invaders, not for aggression.

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The greatest advances, however, are in sea-going qualities, armament and speed. The best torpedo boats to-day have guns that will enable them to sink unarmed vessels of that class, and are able to cross the ocean. Practically all torpedo service now is performed by "destroyers." These are

other great resource is the searchlight. By painting torpedo boats lead color their visibility is diminished, but a vigilant watch will sometimes detect them at night at a distance exceeding half a mile. If the rays of a powerful searchlight are projected in the right direction, it is then only necessary to train an automatic Maxim gun on an assailant to sink it instantly. From a single piece shot can be fired at the rate of over one hundred a minute. Destroyers are built of the lightest sort of plate, and can easily be punctured. Whether they will be driven to adopt armor is a much mooted question, but it does not seem probable that such action will be taken. Anything which adds to weight impairs speed, and, next after the audacity of her officers and men, the great secret of a torpedo boat's success is the quickness with which she can "get there."

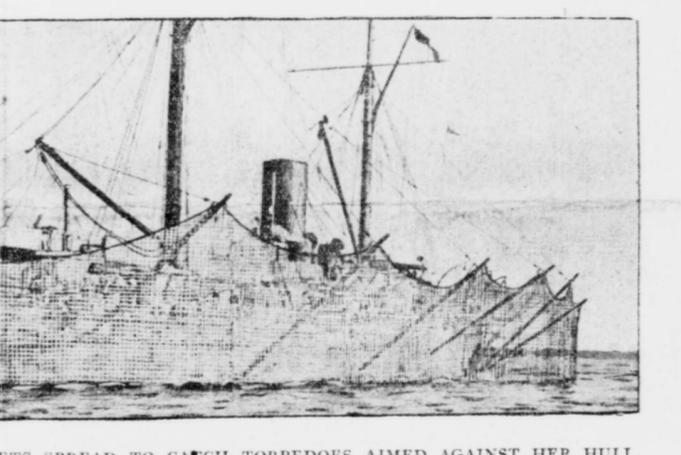
Warship with torpedo nets spread to catch torpedoes aimed against her hull. This method of defence against torpedoes has proved to be almost as useless as it is costly and clumsy. Naval experts feel that their chief reliance against torpedoes lies in powerful searchlights, rapid-fire guns and sleepless vigilance.

adapted to making from 25 to 30 knots an hour, whereas the earlier torpedo boats were good for only about 20. The "Venetian" is credited with 23, the Dupont with 23, the Daring and Havoc (British) with 28 to 29. The Sokol made 26 1/2 knots on her trial trip; between 26 and 32 knots was expected from the last batch of Japanese destroyers, numerous in number, whereas the Viper, equipped with Parsons engines, made 32 knots before her accidental destruction.

Speeds like these enable boats to make sudden dashes and retreats, but they are obtained only at a high cost. Battleships, the slowest of all naval vessels, have scarcely more than one horsepower to a ton of displacement. The "crack" battleship of the American Navy to-day, the Missouri, displaces 12,230 tons, and her engines have 16,000 horsepower. The latter figures indicate the capacity of the Retvizan's engines, and her displacement was 12,800 tons. Now, the Cushing has a displacement of 35 tons, and a horsepower of 2,500 at her command. The same ratio—about 1 to 18—is furnished between the tonnage and power of the Sokol. In the Daring the difference is even more marked. Six displaces only 220 tons, and developed 475 horsepower on her trial. The Viper displaced 370 tons, but her engines showed close to 11,000 horsepower!

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ORIGIN OF OBSERVANCE OF ST. VALENTINE'S DAY. SAME DATE AS LUPERCAL—CASTING LOTS FOR THE CHOICE OF VALENTINES. In 1614 John Donne, a poet and also a dean of St. Paul's, London, apostrophized Bishop Valentine, thus: "Hail, Bishop Valentine! whose day this is, All the air is thy dovecot, and the sky is thy church; And all the chirping choicesters, And other birds are thy parishioners."



WARSHIP WITH TORPEDO NETS SPREAD TO CATCH TORPEDOES AIMED AGAINST HER HULL.

observance. As the feast of Lupercal was celebrated in the middle of February, the 14th of February was selected as the day of honor for St. Valentine. On these saints' days the outlines of some of the pagan ceremonies were preserved, which in a modified form were adopted by the Christian world for centuries.

An old writer says: "St. Valentine was a man of most admirable parts, and so famous for his love and charity that the Valentine festival took its rise from that." Mission, who in 1838 published "Travels in England," wrote: "On the eve of St. Valentine's Day the young folks in England and Scotland, by a very ancient custom, celebrate a little festival. An equal number of maids and bachelors write their true or false name upon separate billets, which they roll up and draw by lots, and the maids, taking the name of the bachelors and men the maids, the bachelors taking the name of the young girls upon a young man that he calls his valentine, and each of the young girls upon a young man that she calls hers. By this means each has two valentines; but the man clings to the valentine that has fallen to his lot rather than the one who calls him hers. First lot rather than the one who calls him hers. First lot rather than the one who calls him hers. First lot rather than the one who calls him hers."

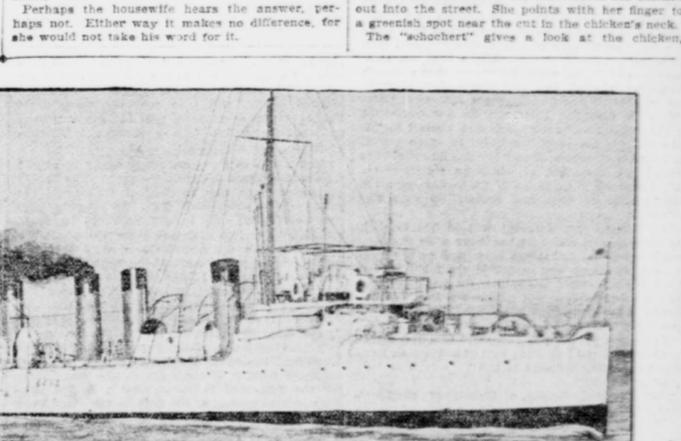
Though St. Valentine in the calendar of love has had his votaries in every age and clime, no devotee has sung in sweeter strains than Shakespeare in the following stanzas accredited to him and intended for Anne Hathaway: "There in bewitched night more rare Than those, because some of them have 'Tis there our hearts a magic more true Than Willy Shallow's is to you?"

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Still doth she leave unmentioned and true They Willy's love anne freynshope, too. Though death with severer faynings blowe Both manne and havye alive byng loose Yet doth he take manne's havye's havye's And strikes naye Willy's havye's havye's

HEBREW CHICKEN MARKET Scenes There Enacted Daily—Fowl Must Be Killed "Kosher." "Haben eis einen guten hahn?" Always it is the same question when the Hebrew housewife goes into an East Side market. "Have you a good hen?" Always the answer of the marketman is the same, "Yes."



ONE OF THE JAPANESE TORPEDO BOAT DESTROYERS.

A "destroyer" is simply a torpedo boat of larger type than usual, and having, in addition to a torpedo outfit, a small rapid fire battery with which to sink the ordinary torpedo boat not so armed.

And so it happens that when you go into a Hebrew chicken market you find the petticoats of a woman hanging outside the door of every coop. The rest of her is lost inside the coop, where she is picking around among the hens until she thinks she has found the best one there. Then out comes the upper half of the woman, and the upper half of another disappears inside the coop. Then the testing of the chicken begins, the woman gathering in little groups in front of the coops, feeling of their own and each other's chickens solemnly and conscientiously. "Ach, mein Gott!" says one, with her finger upon the breast bone of a fowl in her neighbor's hand, "it was hatched before your liver was born."