

Naval Fighters Have Learned Much of the Value of Certain Types of Vessels During Present Conflict.

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UCH has been written concerning the probable result of a battle between modern armored warships, with the heavy protective plates along their sides near the water line and over the decks, covering the space in which the magazines and the intricate and powerful machinery are placed. Of the power of destruction of the guns both at short and long range mounted on these vessels much is known, for before being placed on the ships they are thoroughly tested as to strength and the distance they can throw shells with telling effect. With the ships it was different, for, while they were constructed on the most scientific plans, their ability to withstand shells thrown from the guns of an enemy was an unknown quantity.

It was not until the battle of Santiago between the Spanish fleet in command of Admiral Cervera and the American ships under Commodore Schley that the real worth and power to destroy an enemy and withstand the impact of heavy projectiles were clearly brought out. More interest was taken in this sea fight than in any since the days of the Monitor and Merrimack. Both fleets were composed of the finest vessels of the respective navies and were constructed on the most scientific principles. The battle of Santiago will go down in

carrying more fuel and with increased armament and speed. As the nations have increased in civilization their modes of warfare both on land and sea have changed. The armor's bow gave way to a weapon of greater destructive power, and from the war galleys, whose only power of propulsion was long sweeps in the hands of strong men, came the high-sterned, low-prowed ships, with square sails, of the more modern nations of past centuries. The old craft of the armada type were succeeded by vessels with high freeboard and of many decks, on which were mounted the guns. The ships stood high out of water and had the appearance when all sails were set of supernatural monsters. These in turn were succeeded by the wooden boxes with their loftier spars and creaking yards, but not standing out of the water so high and carrying fewer guns. Some of this type are still in the naval services, but are rapidly becoming obsolete and are being sent to the scrap heap to make room for the powerful steel engines of war of the present time.

to be abandoned in favor of a fireproof substance. The battleships of today are as nearly perfect and capable of holding their own with forts or opposing craft as the rapid changes that are developed and put into use will permit. With the increased velocity given to shells, which are constantly being improved in composition and made capable of piercing the toughest armor on the sides of fighting vessels, changes in the methods of placing protective plates will be necessary. The "fish" sided ships will be succeeded by those of the "tumble-home" type now used largely by the French government. Some of the "floating fortresses" now being constructed for the United States government are of this pattern, while the battleship Iowa and cruiser Brooklyn, both of which vessels have made good records in Cuban waters, were built on these plans. The material used will be abandoned as

speed, and a larger coal carrying capacity to increase the steaming radius at cruising speed to nearly double that of the ships now in use. These, with armor and armament well distributed to meet any attack that may be made, will be largely taken into consideration in the plans adopted for future vessels. To construct the ships on

soon be compelled to give up. This has been shown by one of the English experts, the vessels with great displacement and large caliber rifles are giving way to smaller craft with a greater number of smaller guns, greater speed and larger coal carrying capacity. By a comparison recently made between the larger vessels and the coming smaller ones it was claimed the latter type would have the advantage of discharging more pounds of metal in a given time, would be better protected and have the advantage of presenting a smaller surface to the enemy. Then they would necessarily be stronger and stiffer than the larger ships and more easily handled, while the cost of construction would be materially lessened, and a smaller number of officers and men could man and fight them. The new type battleship and armored cruiser, too, it has been argued, should show greater speed.

It was not until early in the sixties that metal was used to any extent in the construction of vessels. The old "tin plates" which did service during the civil war were among the first metal ships to be constructed for naval purposes. Then came the battle in Hampton Roads which decided the fate of the wooden vessels. Since that time, and with the increase in power in the navy of the world, improvements have come quickly, and the methods

Torpedo Boats Have Woefully Failed to Demonstrate Their Supposedly Great Destructive Power.

value to our government and have made proud records as semi-fighting machines. Much depended on the speed of the auxiliary vessels to aid them either to chase an enemy of equal or lesser strength or to get away from the stronger ones.

As the coast line of the United States is abnormally long and many of the towns and cities along its shore are so situated that it would be practically impossible to protect them on the land side with fortifications of sufficient strength, coast defense vessels have become a necessity. Those that have been used for that purpose are small craft, not only unfit for the work, but unable to cope with the smaller cruisers of a first-class naval power. Many of our coast towns, and even some of our larger cities, might have been bombarded in the war, might have been brought to our borders with telling

With the exception of the heroic work of the Winslow, which, by the way, was not the kind of work the vessel was built to do, nothing has been accomplished by these alleged "death dealing" little craft. Like the fighting tops of the battleships and cruisers, they have yet to prove their worth, and it is possible that they will do nothing in the world, besides the "battleship," and the small rapid-fire guns have in a great measure been instrumental in keeping both torpedo boats and destroyers in the background. Their construction will not permit of their attacking large ships in daylight. Their work is to be done quickly and under cover of darkness. One well-directed dash with the Obery gear was fitted to the steering apparatus has increased its destructive power, and once let loose among a fleet of ships, would soon destroy the most powerful ship and send her officers and crew into eternity. The searchlights, however, have lessened the opportunities for these vessels to show their prowess, and until some better showing is made the construction of other types of warships is considered the better policy. The fight between the Spanish torpedo boat destroyers Furor and Pluton and the converted yacht Gloucester and the auxiliary gunboat cruiser St. Paul and the destroyer Terror failed to show the powers of the Spanish vessels, which were considered ideal representatives of their class.

The needs of a navy in order to be put on a first-class navy footing are many. The Hispano-American war has brought to light what these are and what kinds of ships are best adapted to cope successfully with an enemy. Commodore Philip H. Horn, chief naval constructor, said the bone and sinew of the line is the battleship. We have but few of these, though we have provided for the following, which will probably be, when completed, the most formidable fighting machines in the world: Kearsage, Alabama, Kentucky, Ohio, Maine, Missouri, Wisconsin, Illinois.

The United States, although it only a few years ago started to construct a navy on modern plans, is rapidly gaining in the list of sea powers, and from a low place has gradually risen until it can be safely said that with the fleet it present employed our rank is about third, and even without the auxiliary fleet we would hold that number in fighting strength. Less than a generation ago the navy consisted of a number of wooden ships. They were of the obsolete type, and many of them were going to pieces. When we did start to build a fleet, it was with a determination to have the best afloat, and, while it is not as large as those of some other countries, it is as effective, ship for ship, as any in the world. Besides, the United States has the proud distinction of having vessels of a type not to be found in any of the other navies. These are the ram Katakadin and the dynamite gunboat Vesuvius and the Buffalo. No opportunity has been offered to show the fighting strength of the ram, whose only power of defending herself or attacking an enemy is the powerful ram on her bow, but she is looked upon as being a most dangerous enemy, and once let loose among a fleet of vessels would cause untold damage. While some of the naval experts say that the ram is obsolete and not capable of doing serious harm, despite the fact that one of England's finest battleships was rammed by another and sunk so rapidly that nearly every one on board was drowned, it has been clearly shown that the ram is a formidable weapon, and captains keep their ships clear of them. While the fleet was off the New England coast last summer the steering apparatus of the battleship Massachusetts broke down, and there was a sharp scamping of the other vessels to get out of the way of her ram.

The dynamite gunboat Vesuvius was looked upon as a failure when she was launched, but a series of experiments were made, but these clearly showed that the ship was of immense value for just such work as she did at Santiago a few weeks ago. The Vesuvius was built as the only vessel of her type afloat, and the work of the first named opened the eyes of the foreigners to such an extent that experiments with this kind of apparatus for sea fighting have already been begun by some of the nations of the world. Every war she has had has brought some new and fearful monster to the front to help her to victory. At first they have been looked upon with little concern, but before long they proved their worth in many times.

The needs of the navy today are the type of ships that have demonstrated their value during the present struggle. These are the well-armed, high-speed battleships; cruisers equal to or superior in speed and coal carrying capacity to the best of the present type; coast defense vessels like the monitors, and ships of the Vesuvius type.



THE ST. PAUL AND THE TORPEDO BOAT DESTROYER TERROR.

history as the greatest sea fight in modern times, and it will be many years before it will be equaled. Some naval experts say that time will never come. The handling of the guns and the maneuvering of those powerful engines of war opened the eyes of the maritime powers and the naval sharpshooters. What they had been anxiously looking for since the advent of steel armored ships into the various navies had actually happened, and that was a battle between modern fighting machines. Hereafter these great engines of destruction, built mostly on theory, were looked upon as unknown quantities, so far as their fighting capabilities were concerned. With the conclusion of the battle of Santiago and the clearing away of the smoke a lesson not only as to the worth and power of the vessels, but in the handling of them, the training of men in gunnery, the mode of construction and the best type of vessel best for offensive and defensive purposes has been learned, although at the cost of many lives and millions of property. With the results of this battle will come changes in the construction of naval ships, and some of the new familiar types will gradually lose their place to "more modern" vessels of greater fighting ability.

Of the different types of vessels that now go to make up the lists on the registers of the navies are the battleships, armored, protected and auxiliary cruisers, gunboats, monitors, torpedo boats, torpedo boat destroyers, of the last of which there is none as yet in active service in the United States navy. Of the other types there are several which have made good records, especially those in the battleship and cruiser classes. The much talked of and dreaded torpedo boats have yet to distinguish themselves and prove their ability to destroy or cope with the larger vessels. In the recent operations along the coast of Cuba, and more especially the fight off Santiago, some of the types have been proved successful, though it has also been demonstrated that certain changes and modifications will be great improvements. The high power guns in the forts, owing more to poor marksmanship than anything else, had no effect on the ships of the United States navy, but the shells that were whirled into the Spanish fleet told their story effectively and demonstrated clearly that more than water-tight compartments are needed to keep vessels from sinking, and that some material now used in the construction of warships will have

dangerous in the woodwork used both in the officers' quarters and as backing for the armor plates along the sides of the ships. The wood on some was subjected to a chemical bath, making it supposedly fireproof. Yet when the ships were called into action fire hose was run out, and nearly every piece of wood that could be removed was thrown overboard. The fires on board the Spanish vessels were started by the bursting charges of the shells coming in contact with and splintering the woodwork. It was deemed advisable some time ago to reduce this to the minimum. The German naval authorities stopped the use of wood in their vessels some time ago, and the new ones now in the stocks will have little or none of it in their make-up.

Of the changes needed in the battleship type the most essential are an increase of horsepower, giving the vessels greater

the accepted plans of naval experts will cause considerable sacrifice of space occupied by officers and crew quarters and storerooms. The armor and armament of the more modern battleships must be increased rather than diminished and the works above the water line better protected. To sacrifice the strength of fighting ships in order to increase their speed has been tried, and while the increase of speed was successfully made, the ships in other respects proved failures.

This was so in the case of the commerce destroyers Columbia and Minneapolis. These vessels, the first and finest of their kind to be constructed for any nation, are almost worthless as fighting machines against heavily armored foes, and with their armament can do little damage. In fact, many experts think that against the auxiliary cruisers St. Louis and St. Paul as at present equipped these vessels would

of construction have been changed. With this change new and stronger material has been used until now the fighting machines are built of metals found deep in the earth instead of lumber taken from the forests.

What is the most needful type of ship for a nation's service? is a question that has been asked and argued by the greatest naval experts. Their opinions have differed, each having his own ideas of what style of vessel could do the most service and be used in any capacity. There had been no practical demonstration of the real powers of modern armored ships. The battle of Yalu was the most recent engagement in which modern ships took part, but the result showed comparatively little. It was said it was an unequal match and the Chinese ships were poorly handled. This battle, therefore, taught the naval constructor little, as it did not demonstrate the power of the ships, but since that time many improvements have been added.

Speed is just as necessary for the modern fighting machine as are the guns and armor. The day of the 15-knot battleship and the 18-knot cruiser is rapidly fading, and vessels now considered slow will be practically useless for other than purposes of harbor defense with the advent of the inevitable new type. The speed of the vessels will be increased, giving the battleships not less than 18 and the cruisers from 21 to 23 knots. This will be necessary to cope with foreign nations and the rapid addition of fast transatlantic liners to the auxiliary list of the "sea powers" of the world. These auxiliary vessels have already demonstrated their

effect had we been engaged with a first-class naval power. Fortunately, as it is, the coast is free from invaders.

The type of vessel now suggested for coast defense is of the low freeboard monitor type, similar in construction to the Puritan, Terror and Monterey. Since the war commenced none of these craft has had adequate opportunity to prove its capabilities, for, while the armor and armament are of modern pattern, the engines, the all-important feature of any steam vessel, are of obsolete design and incapable of performing the duties expected of them. While the engines and boilers are in their present condition the place for these vessels is not at the front, but in the dry docks or navy yards. This is particularly so in the cases of the Puritan and the Terror, for, while all modern appliances have been added to the fighting strength of the ships, the engines and boilers are so old as to be well-nigh useless. They were built in the early seventies.

It is contended by many naval experts that ships of the Puritan class are the most powerful type for coast and harbor defenses, are capable of doing untold destruction and in tight places could make two ships of the Indiana class sue for peace. The monitors, with their low freeboard, have very little target space and are so well protected that they can fight at long or close range with equal advantage.

The torpedo boat and the torpedo boat destroyer are as yet unknown quantities, despite the fact that they are called "hor-nets" and the "devil's own weapons."

WATSON'S MISSION TO SPAIN; FORTIFICATIONS WHICH HE WILL FIND ALONG THE COAST.

WASHINGTON, August 6. —A gray-haired officer who was a roommate of John Crittenden Watson in his school days at the naval academy, said the other day: "I remember that Watson's favorite study was always history. He was enthusiastic ever that and was especially interested in the early history of Spain. He was familiar with every period in the story of that country, from the time, 2100 year ago, when the conquering Romans made a landing at what is now Barcelona, down to the years in which the cities of Iberia were the victims of sack and bombardment at the hands of Huns and Goths and Moors, and later from the British and French. Many a night when I have wanted to sleep I have heard him hold forth on the glories of those early days."

"Watson was always just as much of a fighter as a student, and we who know the man can easily understand how blood stirred as he realized today that fate and the march of events have placed in his hand the pen (as represented by our

mightiest squadron) with which another chapter in Spanish history will soon be written, outside of navy circles. Commodore Watson is not so widely known as Sampson, Schley, or Dewey, but with the men who serve under him he is as popular even as Schley. He is a fighter through and through. From the day when he hoisted ensign Farragut to the mast down to the present time he has always been equal to the task wherever it may have been, and the Jackies on board the warships which will make up the transatlantic squadron are simply anxious to get away to Spain with the old man, for they are certain that they can equal the record of Manila and Santiago if only they can meet Camara's fleet."

Watson is essentially a man of the hour in his profession and will not sit in ignorance of his task as a warrior. With the exact information of the Bureau of Naval Intelligence at his command, he will know the details of the coast fortifications of Spain as thoroughly as he does those of New York harbor. He will have on his list of cities which he may be called upon to bombard such historic places as Cadix, Barcelona, Cartagena, Malaga, Valencia, several smaller ports and the thriving seaports of Santander, Coruna and Ferrol, on the northern coast. He knows that all

these cities are fortified to a certain extent, but that, with the exception of two or three, the fortifications are in almost the same condition as they were when the English fleet under Admiral Blake blockaded them in 1607. The guns mounted on them, while not so ancient as this, are most decidedly out of date and many are in poor condition.

The Base of Supplies.

The first consideration in preparing for the naval operations in Spanish waters will be to secure a base. It can be said that the Balearic islands have already been selected as the American base. They are favorably located for this purpose, being a hundred miles off the east coast, within easy reach of all Spanish Mediterranean ports. Although the fortifications of the islands have been strengthened by the mounting of a few new Krupp guns since the beginning of the present war, it is known that it will be impossible for them to offer any effective resistance to the designs of the American battleships, which will be the main body of the command of the squadron when he arrives and has an opportunity to examine the exact situation and the lay of the land. It is a noteworthy fact, although it has

received no mention in any discussion of plans by the department officials, that Admiral Camara's fleet will be directly in the path of Watson's squadron on its way to the proposed base of operations. The base selected by Camara for his fleet is Ceuta, at the extreme point of the African peninsula, opposite Gibraltar. Ceuta is the site of Spain's penal colony, and the place where some of her greatest atrocities have been committed. It is likely that the American tars would go into a fight off this spot with more than their usual enthusiasm. It will be a favorable location for the Americans, too, if Camara decides to stay there until their arrival. The Spanish admiral will have a good harbor to fight in, but will not be backed up by land batteries of any strength worth considering. In fact, it will be decidedly easier to vanquish them at Ceuta than if they lay under the protection of even the poorly manned guns of Cadix. Ceuta is, however, strategically the proper point for Admiral Camara to make his stand, as it is the key to all the Spanish coast cities on the Mediterranean.

Spain's Weak Defenses.

Ever since the first rumor of the hostile expedition from the United States against Spain reached Madrid, the Spanish gov-

ernment has been working with feverish activity in directing the construction of new fortifications about all the larger coast cities. At almost every port now earth and sand batteries have been thrown up at advantageous positions. These defenses are probably as effective against heavy projectiles as any that could be devised for the experience of the American warships with the fortifications of Santiago and San Juan shows that sand and earth much greater resistance than stone and mortar. It is in the matter of ordnance and gunnery that the Spanish ports are disastrously weak. A number of Krupp and Armstrong guns, purchased before the war, have been mounted on these new batteries, but they are too few in number to be effective, and if left to the generally untrained and undisciplined Spanish artillerymen, the Americans have little to fear from them.

It is the Spanish plan to dispute the passage of the Straits of Gibraltar; they will have to rely, aside from the fleet and the insignificant fortifications at Ceuta, on the fortifications at Tarifa and Cernera point. Tarifa depends for its defense upon the big square tower rendered famous by the loyalty of Guzman and Bueno, which dominates the bastioned enclosure of the city, and upon the fortress of the Isle des

Pigeons. This little island communicates with the mainland by means of a fortified drawbridge. It is less than a quarter of a mile wide and is completely encircled by a wide earth parapet, defended by five batteries, all but two of which are uncovered. Not a modern gun of any power is mounted in these batteries, according to the report of a French correspondent who recently visited them, and the force stationed here has been insufficient even to take care of them, so that nearly all require new mountings or are deficient in some other part of their mechanism.

Cernera Point is weaker even than Tarifa. It guards one side of the bay of Algeciras, on the opposite side of which looms Gibraltar. In 1810 the fortifications about Algeciras were all dismantled and the English have seen to it that they were not rebuilt, protesting against each move toward the construction of a modern demonstration against Great Britain. Watson could sail past both Tarifa and Cernera Point without suffering any serious damage, or he could lay to and silence their guns with a few shells from the battleships.

The Mediterranean Ports.

Once past Ceuta the American fleet will same name. It is considered to rank next

find the nearest port of importance to be Malaga, the capital of the province of the same name, and the port of the province of Malaga, in extent of business and shipping, but the fortifications are practically nonexistent. The military authorities have caused the military authorities to throw up several batteries near a lighthouse on the outer point of Malagueta, and new guns have been added to the battery of San Nicholas, but they are of little moment from a strategic point of view.

If the government at Washington gives Commodore Watson instructions to carry on a devastating war, which is hardly probable, he will proceed from Malaga to Cartagena, which is Spain's chief naval arsenal. Cartagena is the most strongly fortified of Spain's Mediterranean ports. Above the town, on the slope of the wooded hills, are located a number of masked batteries, mounting six-inch and nine-inch quick-firing guns of the Armstrong pattern. The situation of these batteries and the fact that the guns burn smokeless powder would make it difficult for an enemy to locate them, and in the present the most formidable appearance to the eye stand on the island of Escondera, two miles from the narrow entrance of the well-sheltered harbor, but