IN my opinion, based upon the lessons of the two "recent wars as I have learned them, the warship of the future should be the battle ship, and there should be two great classes of types. The principal difference in their design should be speed, coal endurance, and the more important of the two classes should be the speedy type, with strong gun-power. A slower class, that would permit the use of a greater number of heavy guns, would comprise the second type ships. The latter would serve admirably to defend harbors from within and to attack forts. I cannot see the question whether the armament of such ships be ten or twelve inch guns is important. Damage effected by the twelve-inch gun, with its wide arc of fire, and during the wars between Spain and the United States and Russia and Japan, hardly justifies its use.

Therefore, ships of both types should carry ten-inch guns, with a greater number upon the battle ship of the second type—which I would call "A Sea-going Coast Defender." Ships of the first type also might be described as "Coast Defenders," because they could defend our shores by attacking an enemy's coast and compelling the presence of that enemy's vessels at home.

The importance of speed in connection with the ships of the first type is so obvious as not to require discussion. The Miniaut class of ships that the British are now "building in great numbers their loyalty's faith in the first type. The propriety of their construction is unassailable.

In connection with these important fighting factors, of course I would not overlook other certain craft that I consider necessary accessories, namely, torpedo-boats, or, rather, I should say torpedo-gunboats—sailor with match boats and seaplanes. This is the point at which I would assert that we must not overlook the real utility of the torpedo-boat.

Such are my views, stated with severest brevity.

What the war-ship of the future will be is a question I cannot answer definitely. We generally would assume that the fighting ships, built from time to time, in their make-up will have the improvements suggested by the lessons and experiences of actual warfare, but that is never the case. The lessons of Manila, Santiago and Port Arthur have been interpreted according to the bias of observers, historians, and navigators. The writers of the last class have prejudices, like other men. Sometimes they follow certain leaders who are always to the fore with positive and dogmatic assertions. Frequently men state their views in advance all persons who disagree with them, and conclude by asking the frank opinion of other people.

From my viewpoint, the most important lessons I have gathered from the recent naval battles, and impressed upon me sometime before, are that the gage of efficiency must be the condition of the boilers and the engines. These must be of not only good design and excellent construction, but must be kept in perfect order by the engineer and his crew, all members of which must be trained, intelligent and industrious men.

The difficulty with the fleet at Port Arthur, for example, was not confined to the destructive damages done by the unexpected attack of the torpedo-boats while the ships were at anchor; the incapacity for prompt defense was due to the fact that the machinery of all the Russian ships was in deplorable condition. The vessels that were not injured in the attack were not in any better condition as fighting factors than the damaged ones, owing to their inefficient machinery and accessories.

The complete destruction of the Spanish fleet at Santiago was due to the wrecked condition of the engines and boilers on the ships: the mechanical efficiency was the real gage of the fighting capacity of each ship and of the aggregate power of the fleet. With the exception of the Colon, those ships were designed and constructed by a reputable Scotch firm, which had established itself in Spain and sent there its foremost and best skilled labor. The ships were delivered to the Spanish Government in good condition, were correctly rated as twenty-knot armed cruisers, and were so considered by our naval authorities, but, owing to the neglect of the engineering force, their actual speed hardly equaled ten knots. Had they been able to go even fourteen knots, when they steamed out that beautiful afternoon, they could have escaped, because the boilers of most of the ships in the blockading fleet were in bad condition. Our fleet was not prepared for such an aggressive action, and the battle was not fought. The engines of the Massachusetts, Oregon and two other ships were in normal condition. The Massachusetts, which was not in the fight, after the war made a speed exceeding that of her contract trial, and before she went to a dry-dock for repairs.

Had the Massachusetts and New York remained at their stations, the Spanish fleet would have been sunk as fast as the ships appeared outside the harbor's mouth.

I have been informed by a distinguished officer, who was in the battle off Santiago de Cuba, that the standard of the twenty-knot Spanish ships was accepted by the officers of the blockading fleet as their actual condition. If so, the reason for that would be "Hard April" incident at the beginning of the fight. But the two "knockers" and gun-powered as they would have surrounded and sunk the first cruiser or unarmed vessel they could command attention. The vital proposition of "getting at the enemy and getting away again" cannot be cried down the wind, like the ghost of a Rhine ganger, "with no functions." I quoted this from a letter of mine, written in April last, that further states my position.

Regarding the subject of boilers: No matter what kind of boilers these ships may have had, or how thoroughly they were constructed, they could not have remained efficient for the last year, because the fresh, coal-powered and the entire engine-room personnel up to the engineers had no experience whatever in running them. The firemen had been, as the Captain stated, directly from the country. We know the result. While the engineers, as a rule, were educated far beyond the fires of their vessel, and ordinarily run engines, they were unable to train the men under them, because they had not had any experience as firemen themselves. Nor was there an intermediate class of people, as in some other navies, to help the chief engineers.

"We have found the same trouble in our navy. The Royal Navy, the best equipped of any in this world with engine-room artisans, stokers and handy men, has had its trials and tribulations.

"And when the machinery has been attempted to overcome these difficulties, English writers now suggest that all dock laborers be trained as stokers, and even the expert firemen are wanted. The Admiralty can draw upon that class of labor. In addition, a large number of boys, about fourteen years of age, are under instruction as stokers. What must the United States navy expect, therefore, if the English, with more practical engineers than any other country can boast and a larger army of workmen to draw upon, confesses to constant discouragement?

"All these complications have arisen from the adoption of water-tube boiler motors, and I have frequently said, if such boilers are to be used, it is indispensable that the engine-rooms be equipped with trained men.

"The troubles of the English and French with defective boilers and incompetent stokers have induced many of their writers on naval subjects to assert that the 'man behind the shovel' is more important than the 'man behind the gun.' What is necessary is to get within effective distance in the quickest possible time. To accomplish this, the boilers must have been, originally, of superior make, and kept at a high temperature.

"In a general way, the introduction of water-tube boilers has revolutionized naval engineering, and has had extraordinary effects upon the capabilities of a warship. One British Admiral describes the pending contest over the best type of boiler as 'The Battle of the Boilers.' Some of the best English authorities go so far as to say that sea battles of the future will be decided by the boilers in the hold, not by the guns in the turret or on deck."

Until recently, comparisons of strength...
THE SECRET OF ETERNAL YOUTH

By Robert Michens

Author of "Green Carnation," etc.

rather than in repose, for not always has she lived among the mountains of Craig-y-Nos.

Mme. Bernhardt, however, is a much more striking instance of one who has worked the secret of perpetual youth. She is never at rest. Here is the most extraordinary life of which I know anything. She thinks nothing of playing a gigantic part eight or nine times a week. This would be more than enough for most people. But, besides doing this, she accomplishes a thousand other things. In Paris she entertains no less than ninety guests at a banquet, and her party can never meet. Wisely directed Powers to-day have large navies, composed of ships of all types, and all of these individual ships are likely to be scattered over the planet when war occurs, so that the large ship may never meet her sisters. The small ship, however, can meet in mid-ocean to settle the question of supremacy.

I was aware of the armistice of Japan, and in an article entitled "Coming Sea Power," published in the "North American Review," October, 1887, made my last article on the subject. At that time I was in regions over Empire toward a place among the naval navies of the world. But my statements did not attract attention for many reasons. I did not declare that when I was nothing of the kind, my theories were thought to be utterly visionary and extravagant. The events of my predictions, although I am much astonished as are the rest of mankind.

While the Japanese were using these arguments, they were training thousands of men with particular reference to the mechanical requirements of modern war-ships, engines, and auxiliary laborers. I find in Louis Livingston Seaman's "Sea Power," "From Tokio to Washington," an important paragraph on the education of Japan.

"There was one building at Kure, the operations of which remind us of the course of the Suez Canal. They saw the thoroughness of Japan's far-sightedness in preparing for war. It was a low shed where wharf

(Continued on page 12)
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SUNDRY MAGAZINE for January 1, 1905

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Fighting Craft of the Future

(Continued from page 9)

were trained to distribute coal evenly and regularly over the great furnaces of the many ships. Probably no other nation even today is making such preparations for training, what with its cheapest labor, in expeditionary methods. The Tic-tac-toe game of water-borne b opportunists, the stokers seem to execute their tasks with as much enthusiasm as if it were to save the life of a ship, or engage in battle operations.

This explains the extraordinary power of Japan, where they train their stokers and all other accessories to war-ship administration. When a builder of battle ships is planning and creating a new torch, a torpedo trip, he exercises the utmost care in the selection of the stokers who are to tend the furnaces due to their exposure to water. Tube boilers makes the stoker's part in the war game vastly more important than in steamers. The young and eager boy who will settle the "Battle of the Boilers" to which I have referred.

Similarly in this country, I have read with great interest the last report of Admiral Converse of the Bureau of Navi-

gation. He says, "The use of water, on the "Battle Ship and Destroyer" contro-

versy, although he does not refer to the question of destroyers in detail, but is given over to the larger question of naval ships and torpedo-steamers. Anyone who will read the whole story of the battleship and destroyers which was declared, by the unexpected attack of the torpedo-boats at Port Arthur. He deals with conditions in actual battle.

The "Early events of the hostilities in the Far East and subsequent accounts of the sinking of all the torpedoes or submarine mines had a prominent part, have given rise to considerable dis-

pute as to relative merit of battleship and torpedo-steamers. Especially the larger type of torpedo-steamers. Destroyers have never had the same chance to show their usefulness as the battleships. Probably the largest unex-

pected event of the war was the destruction of the battleship "Fusaro".

Hat cannot be claimed, therefore, that so far there has been anything to discredit the battle ship as a type of warship and that the battleship is not needed as the basis of the fleet.

The battleship was considered a naval weapon with a naval force requires now, as it has re-

quired in all ages, a type of vessel which shall meet the attacks of another of the most effective war-ship, the qualities of offense, mobility, defense, endurance, self-maintenance. The battleship is the master of the ocean and the heart of an army.

In the future construction of war-ships, it is proposed all or some of these qualities, but in degrees so different as to make them possible. In the end, the battleships are designed to endure with out destruction.

The conclusion that a battleship's existence is insured by torpedo vessels.

Such a risk always has been admitted, and provision is made against it in the con-

struction of the vessels themselves by the most subtle methods of defense, by giving squadrons of heavy ships, the protection afforded by torpedo-boat defense, "With regard to torpedo vessels, it will be recalled that after the war with Spain the United States, with the advice of experts, said that the torpedoes were of no practical value for war purposes. The moral effect alone of the torpedo, which is to make the enemy afraid of the very name of it, is the opinion being further entertained, notwithstanding that the tangible results of the recent war or achievement of the very name of the torpedo is less than at first reported."

As shown by recent "Message and Re-

port," the United States Navy practically indorse the views of Admiral Converse.

The newspapers recently contained cable dispatches announcing the final destruction of the Russian fleet of bat-

tle-ships at Port Arthur harbor. That end of a few of ships fully justifies what I have said about the great power of the fighting campaigns of battleships. The British machinery of these ships been in good condition, they could have dashed through the Russian fleet to certain victory. But their own fleet of them ought to have escaped, because the Russians outnumbered the Japanese at least 5 to 1. The story of the battle-Metre Hill appeal to me as a conclusive demonstration of the capabilities of heavy guns, mounted on large and powerful war ships. Battle ships have no chance in a fight with fortifications, properly equipped, and manned with good men, but they are a menace to those about. Arguments against the use of high-caliber guns on battle ships do not apply to their effectiveness behind fortifi-

cation. I am now more convinced than ever in favor of the fast battleship, but a floating battery should not be a craft which is needlessly upon colonial proportions.

I hardly expect the war-ships of the United States to be the end of all the naval affairs of Spain, nor to be all the events that have been expected from the battleships of the Spanish army in the war.

But the changes in the construction of the vessels themselves will be a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradual and not a sudden, but a gradually

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