



# POLICY, MATERIAL and ARMAMENT of the FUTURE

## as seen by a Former Naval Constructor

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Types of proposed Battleship and Armored Cruiser.

THE Russo-Japanese war is full of instructive lessons. New light has been thrown upon the methods of conducting modern warfare on land and on sea. The balance of power in Europe has been disturbed. The whole face of the Orient has been changed by the military organization of the Chinese, endangering the future peace and welfare of the world. America has begun to play the part of the peacemaker among the nations.

These lessons have value for other nations, but their greatest value is for America, as our own country now crosses the threshold of a great international career. While a general interest attaches to the war operations on land, our chief concern is with the development of our operations on the sea, for America's whole contact with the world, in war and peace, is over the ocean.

The first and last lesson taught by this war is the paramount importance of controlling the sea within the zone of war operations. Had Russia held undisputed control of the sea in the Far East as the outset Japan, unable to reach the mainland and her own Kingdom open to invasion, would have acquiesced in the Russian occupation of Manchuria and predominance in Korea without a resort to war. A few hundred millions put into ships in advance would have saved to Russia the domination of the Orient and changed the course of the world. When Japan gained undisputed control of the sea, Russia came to terms.

No one would deny the importance of the operations of the Japanese armies in Manchuria, but every one must note the advantages in war, but are felt throughout the long years of peace. Not only a nation's influence, but its opportunities for commerce are measured more and more by its power on the sea. No nation can be great in modern times without worldwide commerce, and no commerce can survive where the flag cannot give protection.

We have matchless natural resources and the largest population of high industrial aptitude. Our country, consequently, has become by far the greatest producer of the world's staples of food, of clothing and manufactured articles. We produce far more of these great staples than we can consume, and our national prosperity depends upon access to foreign markets. In the past a policy of isolation was wise for young America, but the time has now come when such a policy is impossible. Our products must go to all parts of the earth and must compete with the products of the great nations of Europe. The world has come to recognize that where peace prevails, and an equal opportunity is given to all, the United States, with her matchless advantages, can outstrip all other nations.

If we would have permanent prosperity we must, therefore, not only give priority

to our products in transit, but to demand for them fair and just opportunities in the markets beyond the seas. Strong foreign policies based on a great navy, are thus an American necessity. Therefore, the supreme lesson of the day for the American people is this, that, for insuring our prosperity in time of peace, for preventing war as long as possible, and for the successful prosecution of war if it must come, we are driven by ineluctable conditions to secure and maintain great power upon the sea.

**Coal Problem Vast.**

For power upon the sea the Russo-Japanese war has shown the importance of having wide dung and carefully located naval stations or bases of operations. All methods of coaling ships at sea have proved inadequate, which has become as vital for a fleet as food is for a man, can be put on board with assurance of success only inside a harbor. After war has begun it can only be safely supplied to a fleet from nearby stations adequately stored before war is declared.

In most of the waters of the earth the bottoms of ships foul rapidly and require frequent dockings under penalty of serious loss of speed. Efforts at cleaning ships' bottoms at sea are as fruitless as efforts at coaling at sea. With so much machinery on board, modern vessels, to remain efficient, must have periodical overhauling, requiring tools and equipment that cannot be carried on board. Furthermore, vessels injured in battle and in accidents, inevitable in the operations of a fleet, must look to a nearby station for repairs. Since the United States has a wide spread and growing commerce over the ocean, the zone of operations in time of war will extend far away from our shores. It is of the utmost importance, therefore, that we should hasten the establishment of strong naval bases in the distant waters of the earth.

This nation's commerce and security demand an isthmian canal, always open, under American ownership and American protection.

We cannot, therefore, safely allow any maritime Power of Europe to establish and maintain a naval base in the waters of the Caribbean Sea or the Gulf of Mexico. As Japanese diplomacy, following the rise of Japan, is causing the British to evacuate Wei-Hai-Wei, and the Germans to evacuate Kiaochow, bases near the Japanese coast should American diplomacy follow up the rise of America by causing the withdrawal of European Powers from the West Indies.

It is imperative that we should lose no more time in building up our fleet and establishing these naval bases. These vital factors of defense cannot be improvised after the war is declared. It takes a long time to build a battle ship—four years on the average—and a long time to establish a naval station. What the war operations, particularly on the sea, may come almost instantaneously upon the declaration of war, and war can come at any time, with but little warning, like a bolt from a clear sky. It is now a hundred times more important than it was in the days of Washington to prepare for war in time of peace. Yet America allows the matter to drift with woful negligence.

The war emphasized the fact that the building of ships and the establishment of bases must be done in times of peace. For

America the situation is critical. Our navy is utterly inadequate and we have no bases beyond our shores. The great obstacle in the way of proceeding to make adequate provision is the lack of public interest, constituting an inherent weakness of our country. To overcome this weakness we should bend every patriotic energy, employing the proceedings of the naval institute, the resources of the Navy League and form a board under the Navy Department to advise to the utmost the public press, the same board to course the censorship in time of war.

Along with lessons in policy, the war teaches valuable lessons for American strategy and tactics. The foremost strategic lesson of the war is the inherent advantage of aggressive operations. The Japanese from the start took the aggressive on land and sea and kept the Russians on the defense until the war was over. Swift and vigorous offense is indeed the best method of defence. The Romans failed utterly to drive Hannibal from Italy until they invaded Africa. Whereupon Hannibal was immediately summoned home to defend Carthage. The coats of Japan and the lines of communications to Manchuria were never menaced because the Japanese kept the Russian fleets on the defensive. Had the Japanese fleets stayed at home to protect their coasts, these coasts would have been in danger and the line of communication broken and decisive operations impossible.

**The Battleship.**

Besides lessons in strategy and tactics the war teaches valuable lessons in questions of material and personnel. For the question of type, it clearly shows that today, as of old, the brunt of battle must be borne by ships of the greatest offensive and defensive power. As the war cloud rises in the Orient we see the battleship type for America, as our operations have been in the past, and the armored cruiser has been conspicuous, though more in scouting and in fighting each other than in general engagements, and torpedo craft have rendered valuable service, but these must be placed with the weaker types in the category of the auxiliaries. When all is said and done the fact remains that, however important operations in the attack and defense of coast lines and of commerce may be under special conditions, the control of the sea has always been settled at last, and must always be settled in great decisive battles, their fighting strength, and in these battles the victory must rest or fall with the rugged ships that can stand up and endure punishment and strike the heavy blows.

It must be borne in mind, however, that the strongest battleship can be crippled in an unguarded moment by a torpedo boat from the weakest craft or from a floating mine. Both sides sustained serious damage in this way, and more careful provision must be made to guard against such incidents. Each battleship should carry, in addition to its usual equipment, at least four powerful pikeet launches, capable of keeping the sea whenever torpedo vessels attack. Both sides sustained serious damage for floating mines and torpedoes. These launches should also be fitted to tow torpedo nets for the ship's protection while slowly moving at night.

In addition, the battleship themselves

should be fitted with powerful outriggers, with which, with reduced speed, they could drive ahead a sweep or drag capable of clearing a channel through which the midship section of the vessel could pass.

Each battleship should also carry a small submarine, specially equipped for clearing the waters and channels of harbors of mines and torpedoes. In addition the wing and bottom structure of battleships should be more developed, with additional inner bottoms and wing bulkheads to cushion and localize better a torpedo blow.

The war brought out another line of weakness in sinking battleships, the want of stability under damaged conditions. The remedy would lie not only in further development of subdivision and improvement of watertight work on bulkheads and around the armor shelf, but also in arrangements for quickly flooding compartments on the opposite sides and opposite end of the ship, together with improved arrangements for quickly drawing swash water from decks into the bilge, where it could be reached by bilge and wrecking pumps. In the case of large wing compartments the flooding of counterbalancing compartments on the opposite side should be made automatic.

With careful and adequate preparation and with proper handling the battleship can be made proof against sudden disaster at the hands of inferior foes, and must be looked upon the type to pound and to hang pounding, the type upon which to hang the issue of battle and the fate of a nation is to be great upon the sea.

While the battleship is thus the mainstay of all maritime nations, it is especially the type for America, as our operations must be positive and aggressive, and extend far away beyond the reach of home support. While the battleship is thus the king, the armored cruiser is the queen of the sea. With power inferior to that of a contemporary battleship, the armored cruiser can nevertheless carry its power further and faster. Its services are indispensable for those swift aggressive operations so advantageous in the early stages of a war. For the United States, where the zone of operations must extend so far away from a base, this type is especially valuable. I believe that we should build one cruiser for every three new battleships.

While the burden of the fighting rested upon the big ships, it cannot be denied that the smaller types played a conspicuous and useful part. They are not only an inexpensive vehicle for a powerful weapon, but they serve a useful part as orderlies and bodyguards to large vessels. Torpedo vessels can only be regarded as auxiliaries, but they are very valuable auxiliaries. The Japanese were wonderfully successful, the Russians were woefully lacking. Until we can build our fleets of large vessels that require a long time, we should build large numbers of torpedo vessels, quickly constructed, as a second line of defence for our vast coast line, including the coast of our possessions, and should develop the navigation of our remarkable inland waters and canals to permit the passage of these small vessels up and down the coast. The Japanese were wonderfully successful in the use of the submarine vessel and the mine and floating torpedoes for harbor operations, offensive and defensive. Each yearly appropriation bill should provide for fifteen

torpedo boats, ten destroyers and five submarines.

During the war scouting played a prominent part, particularly during the stages preceding the battle of the Sea of Japan, when the fleets were approaching. The Japanese were strong in their scouting work, the Russians weak, consequently the battle found the Japanese thoroughly prepared, while the Russians were taken by surprise. Wireless telegraphy has wonderfully expanded the scope and usefulness of scouting, especially with improvements now being developed to prevent interference. A fleet should be kept in constant touch with the enemy, no matter how far away. This service is especially valuable for the United States, particularly during the process of rebuilding our navy, when our enemy's fleet is liable to take the aggressive. Our scouts should be off the enemy's coasts before war is declared, and should keep every fleet located, communicating with America through signal ships stationed at intervals across the ocean. We should follow then the movements of all fleets, and know well in advance their strength and objectives.

Past protected cruisers and converted armaments military powers are the service, especially for transmitting messages, but it present, until special vessels are built, armored cruisers must be the chief reliance, especially when the enemy himself has armored cruisers, but in weaker numbers. The best result, however, for the sea is to build with vitals well below water, with fair deck protection and reduced batteries, with great coal endurance and capable of escaping from the fastest armored cruisers—vessels of about thirteen thousand tons and twenty-seven knots sustained speed. These are the vessels to keep the actual visual contact with the enemy, and should supplant the so-called protected cruisers, save to be an embarrassment to a fighting fleet.

America is, unfortunately, weak in the merchant marine, from which to draw the converted scouts, and her armored cruisers are liable to be far away on independent duty. We must therefore build more of these scout ships. There should be at least two to watch each principal fleet of the enemy and two to accompany each of our principal fleets. We ought to build four of these vessels at once and then build a new one for each three battleships laid down.

The special type mentioned, built to force fortified harbors after the removal of mines and torpedoes, as far as practicable, should be built in large numbers. They should be able to sustain great punishment from heavy guns and torpedoes, having closely subdivided armor, unusually heavy coal supply, light draught, requiring about thirteen thousand tons displacement. We should build four vessels of this special class—three for the Atlantic and one for the Far East.

For the question of tonnage the war brought out the advantage of large sizes for all classes, from the battleship down to the torpedo boat. The military advantage of large displacements is essential inherent. Not only is the concentration of power in accord with principles of strategy and tactics, but since the dead weight of structure varies with the square of a linear dimension, while the military varies with the cube, the proportion of useful weight is greater with the larger dis-

placements. A properly designed vessel of twenty thousand tons displacement should have a concentrated military power equal to that of six vessels of five thousand tons each. The larger displacement gives a steeper gun platform and superior sea qualities, with less loss of speed in a sea-gale, while the conditions of health and comfort are better.

The chief disadvantages are greater draught of water and larger turning circle, but these increase in similar designs only with the cube root of displacement, and with altered designs can both be held in reasonable limits. Of course, the total cost of this ship is greater, but for each military unit it is really less, and the resort to improvised military powers are of an utter delusion. Naval power is expensive, but the more expensive the better, for the size of fleets is relative and the nations with the greatest resources available for navies are the industrial and commercial nations that wish peace, while the nations that are weak in these respects are in the race for sea power. This is a great underlying fact which is sure, sooner or later, to give the dominion of the sea to the hands of commercial and industrial nations and bring about the reign of peace.

For the race with other Powers I estimate that Americans would not be burdened to the level of Europeans if we maintained a navy greater than the combined navies of the world. Furthermore, for purposes of policy and strategy covering offense operations at great distances, the size of vessels for the United States must be larger by far than those of any other nation.

Taking all things into consideration, therefore, I believe we should jump at once to battleships of twenty-five thousand tons displacement, and armored cruisers of twenty thousand tons.

The war seems not to have been prolific in lessons in the question of armor.

The general lesson taught, however, is the importance of adequate protection for armaments military powers are the vitals includes stability and buoyancy. Since the advent of rapid fire guns attention has been too much directed to the vitals life. In naval warfare life is the last thing to be considered, except that life associated with the vital functions of the ship should be the thing and the vitals make the ship. In contemporary war ships the guns are over protected. In subdivided armor, the armor is so heavy that the ship is almost unmanageable. The ship is invariably sunk or turned over while the bulk of the crew are still alive, but the ship is so heavily armored that no armor at all. Light armor cannot keep out armor-piercing projectiles, and in the rapid explosion of projectiles with large charges the blasting effect upon the armor plate rocks and tears the structure of course, this effect is felt upon the armor plates, but in a less degree on account of the greater mass of the plate. The structure behind and below the armor plate was inadequate on the Russian ships. This matter should have the closest attention. Not only should the structure be reinforced, but arrangements

should be made to localize the inflow of water from seams and rivet holes and bolt holes. I believe the best solution would be to place the light armor outside of the heavy armor and have two rows of armor—tight hulls in the region of the water line; that is, to set the heavy armor back about four feet, so that the outer light armor and the structure of the outer armor would be crumpled up against the heavy armor, the inner armor being somewhat analogous to the inner bottom. I appreciate the structural difficulties involved in this arrangement, but they are not insuperable. Proving ground tests should be made to determine the necessary total thickness and the relative thickness of the outer and inner armor, and the necessary distance between them, together with the best form of structure.

Therefore the light armor, as found in existing battle ships, should be abandoned and its weight assigned to heavy armor worked in two thicknesses. A similar structure should be devised for turret armor, though of course water tightness would not have to be considered. Only the main battery should have armor protection. The deck should have armor protection as multiple decks. Splitter deck, or second armor deck, should be thicker than at present over the machinery and magazine spaces and the steering gear, the conning towers and system of communication should have twenty-five per cent better protection. The structure, of course, should be as carefully designed as that of a cruiser to preserve stability in damaged condition.

In the case of the armored cruiser additional weight should be added to the splitter deck protection for turrets. The side armor should be increased considerably in thickness, and the extent reduced forward and the height above water lowered somewhat.

For the scouts, the turret armor should be reduced somewhat, no side armor should be attempted, but double decks, armored, should extend over the battery, which should be kept as low as possible below water.

**On Harbor Defences.**

For the harbor defence vessels the turret armor should not be reduced. The side armor should be kept narrow, but thick, and triple armor decks should be provided for the vitals, the thickness being greatest for the lower deck, the upper comparatively light draught. Having considered the armor of the main battery, the armor deck would have to be about five feet above water amidship, sloping to the top of belt armor at sides, and the second armor deck would be about six inches below the water line amidship, sloping to the bottom of the belt armor at sides. The lower deck should be worked about four feet below the second deck amidship, and sloping to twelve feet below water at the sides, from which point a thick inner bottom should be worked around the ship fore and aft. I estimate that with special design this vessel could be kept down to twenty-one feet draught of water.

In question of speed, the war brought out the essential advantage of higher speed for tactics and strategy alike for all types of vessels. Our navy from the olden days has adopted with advantage the policy of outclassing similar ships abroad in speed, as in weight of armament. Since our sphere of action must cover long distances, and since we are weak in naval bases, our ships should be constructed superior to foreign ships in speed and should have much greater coal endurance. It is this great weight of machinery and coal, combined with the heavier battery, that establishes the large displacement. The adaptation of the steam turbine to marine propulsion has brought about a great advance in power and speed with a great saving of machinery. Therefore I believe the speed aimed at should be as follows:—

The 35,000 ton battleships should have 21 knots of speed.

The 30,000 ton armored cruisers should have 20 knots of speed.

The 15,000 ton scout cruisers should have 27 knots of speed.

The 12,000 ton harbor defence vessels should have 15 knots of speed.

Summing the lessons in material, the Russo-Japanese war teaches the type of ship is the type of vessel upon which America and all other nations must build their naval strength; that after the battle comes the construction of the type of ship more important for America than for other nations; that we must build at once a special type of armored cruiser and should build a limited number of special types of harbor defence vessels; that we should develop the use of the torpedo boat, not only as an agent of attack, but as a consort of battle ships, for its protection, and should utilize special submarines not only for attack, but for clearing channels.

It teaches that the heavy gun is the king of weapons and the mainstay for offensive power in the shock of battle; that other guns play the minor role of protection against the main battery, and which the light rapid firing gun is best suited, so that the medium calibre battery should be omitted from vessels of the first class; that a greater percentage of weight should be given to armament than is found in ships abroad, principally at the expense of armor.

It teaches that the weight per cent of armor should give way somewhat to offensive features of armament and speed and should recede from the wide distribution that has characterized the past. The rapid fire gun and be concentrated more upon the vitals, omitting the light armor altogether; that turret armor is over developed, and should be reduced and side armor; that armor is most effective when distributed on multiple decks; that the armor of conning towers and tubes for apparatus of communication should be increased. It teaches that speed, like armament, should be generally increased. It teaches that the steam turbine gives greater possibilities.

These changes, combined with the general lessons of the war, call for increasing displacement of our type, especially for American ships, which should be the largest in the world.

While the above lessons in material are important, the most important lessons are those in personnel.

In the Japanese victories it was not so much a question of differences in ships, for the Russians had good ships, but a difference in men, not difference in courage, but a difference in training. A general inference to be drawn is that these victories, like most of the victories of old, were carried off by seafaring people.

The war teaches that the man behind the gun is more important than the gun; that this man must be a seaman; that seafaring is a profession, and that the advantage of military and inland people, and consequently the dominion of the sea will ultimately rest with the commercial nations, the nations of seafaring men, and the man a man must live at sea; that consequently a mercantile marine is the chief foundation of other naval power; that America, so woefully lacking should proceed without delay in the rehabilitation of our decayed merchant marine and should develop a navy of seafaring men, and that we should increase at once the number of officers and enlisted men in the regular navy and keep our ships in commission and at sea; that a halt of hard work is absolutely necessary in modern times; that the standard should be kept high as the Naval Academy is a post graduate course established there; that the inducements in pay and advancement should be increased for enlisted men; the standard of recruiting should be high and the methods of instruction and training should be improved and developed; that, above all, a liberal allowance for ammunition should be made for target practice; that our matchless naval traditions should be cherished and the loftiest ideals kept before the officers and men.