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WOOD

POLICY, MATERIAL and ARMAMENT of the FUTURE

as seen by a Former Naval Constructor

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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 to have the outer 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 nearly deadweight 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. The turret 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 greater for the lower deck. Having comparatively light draught, the upper 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 present draught 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 to outstrip foreign ships in speed and should have much greater coal endurance. It is this great weight of machinery and coal, combined with the heavier turret, that establishes the large displacement. The adaptation of the steam turbine to marine propulsion has brought a great advance in power and speed with a great reduction in weight. Therefore I believe the speed aimed at should be as follows:

The 35,000 ton battle ships 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 reasons in material, the Russo-Japanese war has taught the upper Atlantic is the type of vessel upon which America and all other nations must build their strength; that after the battle of the sea comes the battle of the air, and that a limited number 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. The heavy armor, the heavy gun is the king of weapons and the most offensive power in the shock of battle; that other guns play the minor role of protection against the main battery, 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 development, and that side armor, 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 the displacement of our types, 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 the 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 nation, the nation of seafaring men; that a 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; 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.

to our products in transit, but to demand for them fair and just opportunities in the markets beyond the seas. Strong foreign policy, 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 inexorable 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 well 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 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 defence until the war was over. Swift and vigorous offence 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 Battle Ship.

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 battle ship as the king, the armored cruiser as the queen of the sea. With power inferior to that of a contemporary battle ship, 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 battle ships.

While the burden of the fighting rested upon the big ships, it cannot be denied that the torpedo boat and the destroyer played conspicuous and useful parts. 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 quick to learn the lesson of the torpedo boat. 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 torpedo boat and 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 handicapped, 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 battle ships laid down.

The special type of harbor defence vessel, previously mentioned, built to force fortified harbors after the removal of mines and torpedoes, as far as practicable, should be constructed with vitals well below water, moderate speed, fair 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 size for all classes, from the battle ship 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-

Types of proposed Battleship and Armored Cruiser.

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