Naval Problems of 1935

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NAVAL PROBLEMS OF 1935
A British View

By Admiral Sir Herbert W. Richmond

WE ARE upon the threshold of decisions concerning naval policy which will affect profoundly all the great nations for generations to come; and not the great nations only but also the smaller, whose fortunes depend, as we have repeatedly seen, upon those of the greater. Two things are at stake — security and economy. Although defense, in Adam Smith’s words, may be more important than opulence, economy in providing defense is not to be despised. If an equal degree of security can be procured at a lesser cost, the methods by which it may be obtained are certainly to be preferred.

Whether, as a result of the conferences that are ahead of us, we obtain security with economy — in other words, efficiency — depends upon the thoroughness with which the problems are investigated. To say that these problems have not hitherto been investigated with the thoroughness which characterizes all real scientific investigations is assuredly no more than a plain statement of fact. That there has been a great deal of discussion between technicians, on technical matters, is true enough. “Expert” has opposed “expert” in his capacity as a litigant pleading in support of the views of his own particular administration; and statesmen, it would seem, have stood behind their experts without making any very searching examination into their case. The pitiful displays of special pleading at Geneva on the subject of offensive and defensive instruments will be fresh in the minds of all.

The naval estimates of the various maritime Powers already reach very high figures. When the existing ships are replaced by new types, larger, faster and more complicated, it is a mathematical certainty that the cost will rise still higher: and — to take a special case — unless the sea routes of my own country are to be in a permanent condition of insecurity, the only alternative to a system of alliances (which may or may not be desirable) is to build vessels in greater numbers than those allotted by the Treaty of London.

Thus the Naval Conference which is due to meet next year demands the most consummate care in its preparatory stages. Three things in particular are needed—long views, scientific methods of investigation, and recognition of the needs of others; concerning the last of which I would recall some words of Wellington in a letter to a French friend: "Soyez sûr qu’en politique il n’y a rien de stable que ce que convient aux intérêts de tout le monde: et qu’il faut regarder un peu plus loin que soi-même." Thus, if any of us is persistently attached to some particular arm, let him not only convince himself that his reasons for his attachment are really sound—and mistakes in policy are possible, even in the highest quarters, as we in our own country are only too painfully aware—but also that persistence in that policy will not injure others and provoke in the end that instability which it should be the object of statesmen to avoid.

There are some differences of opinion which need the most careful examination, and it is to one of those in particular that I wish to call attention—the difference concerning the limit of size of the types of fighting ship. I speak of it in preference to others because it is one which involves the greatest cost and, in the long run, will have one of the greatest effects upon the future.

British opinion holds that a reduction can with complete safety be made of about one-third in the size of the principal fighting ships, and of about one-half in the size of cruisers. American opinion holds, or has hitherto held, a contrary view; which is that, consistently with the security of the United States, it is impossible to reduce the "capital" ship below the figure adopted at Washington in 1921, namely 35,000 tons, and the cruiser below 10,000 tons.

Now, as a first step in considering this question, it is necessary to ask why those sizes were then adopted. With what objects was it decided that a "battleship" must be of that size? Were those objects strategical, tactical or technical? Or was it merely a size which in the conditions of that moment it was expedient to adopt, and was the object, therefore, expediency?

I do not think that there can be the smallest doubt that the reason was expediency. What was the situation in which, at comparatively short notice—notice certainly too short to admit of

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1 The present writer, it should be said, thinks that the possible amount of reduction is underestimated in the case of the principal ships.
any profound examination of the strategical elements — this size was selected? A great war had been recently concluded, and was in process of being followed by a ship-building competition, from the cost of which even the richest nations recoiled. One battle at sea had been fought, and from that battle certain conclusions of a purely technical nature had been drawn regarding the protection of ships against gunfire. In addition, ships had on occasion been struck by mines or torpedoes. New ships had been designed after the war with these technical elements in mind. These ships were given armor and underwater construction to guard them against injury, and guns of the largest size to overcome the protection of similar vessels of other Powers. Thus, while the heaviest guns afloat during the war were of 15-inch caliber, those of the projected ships would have been, so it is understood, of 18-inch caliber. The ships embodying those features would require a displacement of from 48,000 to 43,000 tons.

Very fortunately common sense came to the rescue. An agreement was made at Washington which, limiting the size of the gun to 16-inch, enabled the tonnage to be kept down to 35,000 tons. It is thus clear that what decided the size of the ship was the size of the gun. Now, ship construction, properly regarded, is applied strategy and tactics. The design of an instrument is governed by the end which it is intended to achieve. The object, as selected in this case, was not the strategical or tactical aim, but the carrying of a gun of a certain size. The assumption was made that it was necessary that those ships which constitute the “mass” of a fleet should carry 16-inch guns. Is that “necessity” a fact?

The correctness of this assumption is of the very greatest importance, for it is no exaggeration to say that the expenditure of thousands of millions of dollars, francs, lire, yen, pounds and, eventually, marks also, depends upon it. What the assumption amounts to is just this: that the fulfilment of the needs of strategy and tactics — that is of the employment of that instrument which we call a navy — is impossible if certain ships are armed with smaller weapons than 16-inch guns. Let us examine this most serious, and expensive, theory.

What are the needs of strategy and what is its aim? The preliminary to an answer to this question is another question: What is strategy? The art of strategy is the art of disposing force, by
means of movements, in such a manner as to produce superiority at a desired spot. If the enemy fights, the expectation is that he will be beaten: if, fearing to fight because of his inferiority, he declines the contest, he exposes himself to that form of injury against which his sea forces were built as a safeguard.

The size of the gun, standing by itself, cannot in any way affect the conduct of strategy. The various measures which from time immemorial the strategist (in the person of the statesman or the seaman) has employed in order to achieve superiority have not been dependent upon the size of the guns carried by the ships of the opposing navies. Whether the guns should be 18-inch, or 16-inch, or 8-inch or 6-inch, is immaterial. The strategical combinations and dispositions of the modern wars between Russia and Japan, or the Entente and the Central Powers, were not dependent on the size of the guns with which the several fleets were armed. In one way only was the gun of strategical influence. It demanded a larger ship to carry it. Growth in the size of the ship has this result: that the larger the ship, the less choice she has in the number and position of the bases she can use, and, therefore, while strategy demands mobility, the influence of increased size is to reduce that essential quality.

So far as tactics are concerned, the tactical employment of a fleet does not call for the use of heavy guns. The art of tactics is merely the art of strategy on a smaller board. It consists in bringing about a concentration of superior force upon a portion of the enemy. It is that which the great tacticians of all ages have had as their aim — de Ruyter, Rodney, Suffren, Nelson, Togo. This is in no sense whatever governed by the possession of a certain gun. Tactics are invariably accommodated to the weapons available, and the weapons themselves are purely the result of competition, not of some intrinsic need of tactics. In one connection only can it be said that the size of the gun may constitute an intrinsic quality. The introduction of a locomotive torpedo brought in an element of chance in battle, which men dislike. A sea fight, as Nelson said, is always subject to chance, and there is a not unnatural desire to reduce the element of chance as much as it is practicable to do so. A gun which outranges the torpedo, provided it can be used effectively at that range, would enable fleets in most, though not in all, situations to fight outside the torpedo range of the enemy battle line. But in so far as this is a necessity — which is debatable — it does not introduce any
need for guns of this great caliber. The torpedoes in the battleships at Jutland did not play any part in the battle, though the ships engaged were armed with smaller weapons: and it is a plain fact that modern guns of a smaller caliber outrange the torpedo. I have heard it urged that the very great gun is necessary because it might so happen that a fleet, in the course of a battle, might come within the range of an enemy fortress, and that if heavy guns were mounted in the fortress it would go hard with the fleet. It would. And if that should happen, a fleet would have to do what fleets have always had to do in the past—haul off out of range: for one does not continue a pursuit when an enemy has received a considerable and effective reinforcement. The fact that the ships were armed with 16-inch guns would make no difference whatever. They could no more disregard the fortress guns than their predecessors could, for a fortress can always carry guns as large, or larger than, those of a ship. So, one of the results of mounting heavier guns in ships is to increase not only the cost of the ship, but also that of all the shore defenses of every country. It does nothing, however, to increase security.

Technique remains. Great size in the ship was necessary to carry the larger guns and to clothe the ship with the armor thick enough to keep out the shell fired by the similar gun of the enemy. But wherein lay the intrinsic need for guns of this adopted size? Is it impossible to fight a battle between fleets whose ships are armed with guns of a lesser size? The whole evidence of fact contradicts any such supposition. At Tsushima, the only decisive fleet action in modern times, the largest guns were of 12-inch caliber, and there were fewer of them on the winning than on the losing side, as the following table shows:

<table>
<thead>
<tr>
<th></th>
<th>12-inch</th>
<th>10-inch</th>
<th>8- and 8-inch</th>
<th>6-inch</th>
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<tbody>
<tr>
<td>Russian fleet</td>
<td>26</td>
<td>15</td>
<td>8</td>
<td>66</td>
</tr>
<tr>
<td>Japanese fleet</td>
<td>23</td>
<td>1</td>
<td>34</td>
<td>98</td>
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In the face of that fact, and with the further corroboration that a decision was not obtained by a fleet greatly superior to its opponent, carrying a hundred more guns and most of these of heavier caliber, it is impossible to imagine that any seaman could be under the delusion that the aim of battle, a decisive result, is obtainable only by the use, in both fleets, of guns of 16-inch caliber.
Thus, the adoption of 35,000 tons as the tonnage of the so-called "battleship" was primarily due to an assumption that the gun carried by that type of vessel must be of 16-inch caliber. That that assumption was incorrect is as plain as anything can possibly be. Neither the needs of strategy, which is hampered by great size, nor of tactics, which almost disappear with great size, nor of technique, demanded such a gun. There was, however, another reason — expediency, or what was believed to be expediency. No one is unaware of the practical fact that while reason may clearly indicate a certain course, its adoption may be inexpedient. Popular sentiment, the fear of the demagogue and of the press behind him, prejudice, and an unaccustomed outlook all come into play. At the time of the Washington Conference there were great ships of approximately this size, and over, under construction. It required no small amount of political courage to make the sacrifice that was then made of several of those ships, both in the United States and Great Britain, unnecessary as they were and burdensome as they would have been if they had been retained. Today, after thirteen years, we are able to review the problem under calmer conditions. We have had time and opportunity to reconsider the whole matter in the light of strategical requirements and, not less important, in that of the political developments in the world. We are able to take, if we choose so to do, a wider survey of the question than it was practicable or expedient to take in 1921. The time for expedients has passed, and we are now arrived at a time when principles should be adopted as our guide.

While the size adopted in 1921 was determined by the assumption that the 16-inch gun was necessary, and by expediency, another reason came to the front in the succeeding years. Great size was claimed to be necessary in the battleships of a Power which had long distances to go and few bases abroad. The thesis was advanced that a battleship must be able to leave its base, fight its fight, and return to its base in spite of its damaged hulls. That thesis is indisputable. The deduction drawn from it was, however, highly disputable. If the scene of action should lie at a great distance from the base, or, in other words, if the country should not possess bases in the localities in which its fleet may be called upon to operate, it was assumed that the battleships must be of the size adopted at Washington in order that they should be able to make this double voyage.
Every doctrine proceeds from some assumptions. If the assumptions are correctly made, and if the deductions made from them are logical, there will be reason to suppose that the doctrines represent the truth. Are the assumptions in this case indisputably true?

The picture which this theory presents is one of a body of battleships proceeding from its base remote from the area in which it is required to exercise its influence, bringing an enemy to action, defeating him, and returning to the only place to which it can return, its base. That picture is incomplete. That which proceeds on such occasions is not a body of battleships alone: it is a fleet. A fleet is a fighting force composed of the principal fighting units, of the vessels which provide the command with information, of the lesser vessels which protect the large against the submarine; and, if the enemy possesses a surface flotilla, a similar flotilla is needed, or its counterpart in some form. The flotilla of an opponent cannot be disregarded even though there should be a great superiority in the battle-line. As an example we may recollect that at a time — 1917 — when the losses of Allied trade from submarine attack were bringing the Allied cause perilously near to disaster, and when the only way by which those losses could be reduced was by the use of a large number of flotilla craft in defense of the shipping, it was not deemed practicable to denude the Grand Fleet of its flotilla, in spite of the fact that the force of battleships was greatly superior to that of the enemy. Why? Because of the enemy’s flotilla.

So the fleet which, supposititiously, is proceeding to conduct operations, which are intended to culminate in battle, against another fleet composed of an equal or inferior number of battleships, together with a flotilla, will certainly require a flotilla itself. It will need flotilla craft to guard it against submarines. It will need “eyes” in the form of cruisers. From that it follows that the base must be near enough to permit these essential lesser vessels to make the same voyages, and possess the same endurance for cruising, as the battleships. But if the hypothesis of great size be correct, this endurance cannot be furnished in vessels of less than 35,000 tons. How then are the services performed by the cruisers and the flotilla to be rendered? We say that the speed of a fleet is the speed of its slowest ship. With equal truth we must say that the endurance of a fleet is the endurance of the least enduring of the vessels of which it is com-
posed. The difficulties are, in fact, not overcome by conferring great powers upon the battleship alone; they must be conferred upon the fleet as a whole. If it is impossible to give the lesser craft the requisite endurance, the only alternative is the acquisition of bases nearer to the objective. If it is possible to give the lesser vessels the endurance, it follows — obviously — that, as the requisite endurance can be obtained in lesser vessels, so this alleged necessity for great size disappears. If nearer bases cannot be obtained, the fleet cannot operate, while if nearer bases, within the range of the lesser vessels, can be obtained, again the necessity for great size, in order to obtain endurance, disappears.

Again, is it an established fact that the great endurance demanded is possible only with ships of 35,000 tons? The armored 10,000-ton vessels recently built in Germany have an endurance of some 20,000 miles, which is greater than that of the battleships of over three times their size.

The picture, however, is lacking in verisimilitude in another respect. It supposes that a battle can be brought about at the place and at the time desired by one of the combatants. Nothing could be farther from the fact. The appearance of a superior fleet off the port or coasts of an enemy does not necessarily provoke him to battle. Whether he fights then, later, or not at all, depends entirely upon the prospects he sees of victory. If, in his opinion, there is little likelihood of a victory, or of an effective disablement of the enemy, he refuses to be brought to action at an existing disadvantage, but makes such use as he can of the art of strategy to create more favorable conditions. Certainly, if the fleet can take up some position and maintain it, from which it overawes the enemy until a decision by some other means is attained, it will achieve its purposes. But this is precisely what the hypothecated fleet would be unable to do, however great the endurance which may be conferred upon some of its units by the increase of size. In fact, any idea of substituting endurance in a part of the fleet for the possession of bases within effective operating distance of the whole is a dream. Certain it is that bases may be acquired, though this in turn is only possible if the fleet, as a whole, can reach and command the area while the capture is being made. The one fundamental necessity of a fleet base is that it shall enable continuous operations to be conducted. The fleet must be continuously near enough to its opponent ef-
fectively to dominate him. That it is which has always governed the position of a base, whether it was at Gibraltar or Port Mahon, the Firth of Forth, Taranto, or the Elliott Islands. When such a base has been acquired, it is possible to create repair facilities sufficient to give first aid to the wounded ship which shall enable her, whatever her size, to make an ocean voyage in safety.

One misconception, therefore, which appears to inform this theory of the necessity for great size in consequence of an absence of bases arises from thinking in terms of one arm only of a fleet instead of a fleet as a whole. We do not think of armies in terms of the infantry. We have also to consider the other arms, the cavalry (or its modern equivalent), the artillery, the air forces. So, too, we need to think of a fleet. It is a new thing, one which those of our predecessors from whose wars and campaigns we have been accustomed to take our instruction did not need to take into consideration: for the frigate had as great an endurance as the three-decker, and there were no vessels of short endurance corresponding to the modern flotilla craft constituting an essential arm of the fleet. But the general principle was the same. The fleet must possess a base near enough to the enemy's position, or be able to cruise continuously in a station from which it could, as a body, ensure interception of the enemy fleet upon whatever mission it might embark.

There appears to be a second misconception in the assumption that a battle can be commanded when and where one wills. Long and sustained operations usually precede a sea fight. If one side feels itself strong enough to gain a victory, the probability is that the other feels itself too weak. There have been occasions when each felt such confidence in itself that the desire to fight was mutual: but they are few. There is, moreover, a certain phenomenon which is also not undeserving of notice — the indecisiveness of the first great actions fought at sea in almost all wars. There is a curious consistency in the record. The words "decisive action" are in men's mouths, but either the will or the skill or the means have not had time to develop. We see it in the battles off Toulon (1744), Minorca (1756), Ushant (1778), the First of June (1794), the Tenth of August (1904) and Jutland (1916). Each of these was the first battle of the war. Each was indecisive. The risks which men will take later, when they have greater confidence in themselves, they are disinclined to take in the early stages. A shipbuilding policy based upon expectations
of decisive results in a single immediate great battle rests upon an insecure moral and historical foundation.

Apart from these strategical aspects of the question there are others which demand no less sober consideration. I have said earlier that we require to take wide and long-sighted views — wide, to include all the countries concerned, and long-sighted to include the eventual effects which will result from the policy adopted. Did we take wide enough views when we prescribed for France and Italy in 1921? I certainly think we did not. Neither of those Powers then desired these large ships, and France wished for greater numbers than the terms of the Treaty allowed her. Italy was prepared for any reductions in size provided other Powers made the same reductions. But now we see a change. France has thought fit to design a vessel of over 26,000 tons, the reason given being that it is necessary for her to have ships of this size to deal with the 10,000-ton ships produced by Germany. Italy has recently decided to build ships of 35,000 tons, not because of any newly discovered intrinsic necessity, but merely because other Powers appear determined to maintain that size. France, in her turn, must necessarily reconsider her position.

What is to be the outcome of it all? If the size becomes stereotyped, firmly established, what is to be the situation in that future which only those who are wilfully blind refuse to foresee? Germany asks for “equality of status” — in other words, the right to possess weapons which are permitted to other nations — tanks, submarines, bombing aircraft, aircraft carriers, heavy field-guns and battleships. She may, or she may not, exercise that right to the extent of building ships of precisely the maximum size, but is it to be doubted that she will, when the time comes, furnish herself with very powerful ships — ships at least capable of occupying their full attention? What, then, is to be the effect upon her neighbors? Are we to suppose that France will rest content with the number she is now able to possess — five, or a larger number of ships somewhat smaller? What, then, will become of the “ratios” established at Washington? If it be true that the only means of making ships secure against aircraft is the adoption of great size, it would follow that Germany would have as much need of that size as other Powers. And what does the future hold in store for two of the Baltic Powers — Poland and Russia?

The other major point which the Conference must consider
is that concerning the cruiser forces. It is one both qualitative and quantitative in its nature. The principle which has hitherto governed the size of the cruiser has been that she shall be large enough to perform those services for which she exists — scouting with a fleet, and duties of a detached nature, mainly on the lines of communication. Experience has fully demonstrated that the qualities necessary for the performance of these duties could be obtained in vessels of about 5,000 tons. Larger cruisers were built in the nineties by France and Russia, not because the existing size was inadequate for the purposes to be fulfilled, but in order to carry armaments superior to those of another Power. The larger size was the result of the French conception of the guerre-de-coursel which brought into existence an armored type of vessel superior to the then existing normal "unarmored" cruiser. Of this the German writer, Admiral Maltzahn, wrote that "England had to respond by building armored cruisers in her turn . . . and when this stronger type was once in existence, scouting and reconnoitring vessels had to conform to it. For in face of an opponent with such powerful ships, scouting vessels would be unable to do what was required of them unless they themselves possessed similar advantages. It was thus, then, that this chief division in the cruiser class arose." The result was a rise in the size of the cruisers of all Powers. The late war gave no indication whatever of any necessity for the increased size, nor any advantage to any of the combatants from its possession. The British cruisers of between five and six thousand tons proved themselves capable of fulfilling all the duties that fall to cruisers, even in such remote waters as the South Pacific where no bases existed. Observe, too, how the cost of the ship has increased. The ship of 5,440 tons which served all the purposes of a cruiser cost £353.437. The cost of the "small" cruiser of 7,140 tons which today takes her place is £1,667,819, or approximately four and a half times as much. And the still larger ships of 10,000 tons are proportionately more costly. Yet, so far as function is concerned, they can do no more than their predecessors — fight their similar opponents and control the movements of shipping. It does not appear unreasonable to assume that if in 1912 it was possible to build a ship of 5,440 tons which could do all that a ship of its class was required to do, it should be possible today, with our increased knowledge of use of metal and fuel, of improvements in machines and artillery, at least not to need a larger tonnage to
fulfil the same needs. If a 6-inch gun was large enough twenty years ago, why is a better 6-inch gun not large enough today?

The other point which will need reconsideration is that concerning numbers. The principle upon which the number of cruisers required by Great Britain has always been calculated has been that of objectivity: the number was dictated by the needs. What were those needs? The defense of trade required that cruisers should be in a certain ascertainable number of places, either escorting convoys or patrolling; and the main body, or bodies, of the fleet needed scouts. The total number of cruisers was that which met these two needs. It was calculable and had been calculated. That principle was for the first time abandoned at the London Conference.

The needs of nations differ. They are not relative. The balance of fighting strength was unaffected by cruisers until, as mentioned above, larger cruisers were introduced. But so long as the cruiser possessed no "battle value" she could not affect the issue: for the decision in war rested, and must always rest, upon the result of conflict between the massed fighting bodies. Each nation could regard without anxiety the cruiser forces of others so long as the numbers plainly expressed the functions of security. Comparisons of the value of seaborne trade, or of the total tonnage or value of entries or departures at the ports, do not furnish a criterion of a country's dependence on the sea or its need of cruisers. There are other elements. These are the relative importance of foreign trade in the economic life of the nation; the nature of the imports; the proportion of foreign trade to total (domestic and foreign) trade; the trade per head; the proportion of foreign trade carried in its own bottoms and therefore not protected by the Treaty of Paris (in Britain this amounts to 86 1/2 percent, measured in value); the proportion of oceanic trade to trade passing across land frontiers; the geographical situation and the extent to which the approaches to a country are susceptible to attack. Nor is another important consideration to be left out of account — ability to defend. The defense of trade, as all experience has amply shown, is possible only in those parts in which the sea forces can find the necessary

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1 A calculation made by a body of economists for the Twentieth Century Fund ("Boycotts and Peace," New York, 1932, p. 206) gave a rough indication of the relative importance, taking as index the United States = 1.0. It was as follows: Japan, 1.8; Italy, 2.4; Germany, 2.6; France, 3.7; United Kingdom (trade outside the Empire only), 5.1.

2 Value in dollars of exports and imports per head of population (1929): United Kingdom, 196; France, 101; Germany, 97; United States, 77; Italy, 46; Japan, 31.
facilities, i.e. bases. No extensions of endurance or numbers, except upon an astronomical and impossible scale, would for example enable Britain to defend her trade in the Mediterranean in war with a Mediterranean sea Power if she had no bases in that sea.

The true solution of the problem of cruiser strength can only be found if the question is looked at as a whole, with both needs and possibilities in view. If we were all to return to the wise policy of some years ago of keeping the size of the cruiser down to the very smallest figure compatible with the performance of her ultimate functions—scouting and the security of traffic at sea—and leave to each nation the decision as to how many vessels its own security in this respect demanded, we should get not only economy and security, as we used to have them, but we should remove one of the causes of political disquiet. Ratios there have always been in battle forces—the two-power standards of Britain of the eighteenth and nineteenth centuries, the temporary two-power standard over Continental Powers of the France of 1890, the five-to-four standard of Italy vis-à-vis Austria. But never have there been ratios in "cruiser" strength; for the plain reasons that the cruisers, having no battle value, did not alter the relative strength, and that the needs of cruisers are measured upon the basis of what they have to do; which, in turn, is primarily measured by the number of positions in which it is necessary to employ them. The fundamental error of the principle of a "total tonnage" allowance of cruisers lies in the fact that equality or some other proportion of tonnage does not represent equality, or a similar proportion, either of strength or of security.

Let us be perfectly clear in our minds as to the alternatives open to us, and their results. We can persist in our retention of the very large ship, battleship and cruiser, or we can make drastic reductions in their sizes, down to as low as those allotted to Germany. The former course will cause, first, an increase in our already immense naval budgets, because of the cost of the large and costly ships: it will cause a further increase because "improvements" are constantly added in the course of time—the example of the fourfold increase in the cost of the "post-war" cruiser is a warning in that respect: and it will cause a still further increase later—not today, perhaps, or tomorrow, but at a time

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4 I have confined my attention to these, but obviously there are also the questions of the submarine and the aircraft carrier.
not so far distant that we cannot foresee it—when Germany, restored to "equality," provides herself with the instruments now denied to her; including the "big" battleship and the "big" cruiser, to say nothing of the submarine, the aircraft carrier and the sea-going flotilla craft of all kinds. All those causes which, under mistaken interpretations of the part which sea power plays in the world, have contributed to produce navies, will repeat themselves in a more costly manner. We in our time have seen the cost of navies multiplied twofold in some cases, tenfold in others, for three main causes—political ambitions, the introduction of new instruments of warfare, and the craze for size. We can at least remove the last of these causes and even reverse it. A very heavy burden lies upon the statesmen, with whom the decision rests, clearly to prove that the sizes upon which their experts insist are in reality essential to the security of their nation. No proof of that necessity has yet been given to the world in respect to the present sizes.

The alternative to progressive increase in cost lies in reduction, drastic reduction, in size: and in the establishment of navies upon the logical basis of needs in relation to function instead of upon the false bases which have governed policy in recent years, to the eventual distress and insecurity of the world.