The Standard of Naval Strength

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THE STANDARD OF NAVAL STRENGTH.

By Lieutenant CARLYON BELLAIRS, R.N. (Retd.), M.P.

Thursday, 6th December, 1906, at 3 p.m.

Admiral Sir R. H. HARRIS, K.C.B., K.C.M.G., in the Chair.

The Traditional Policy. "The House of Commons, even when most discontented and parsimonious, had always been bountiful, even to profusion, where the interests of the Navy were concerned."—*Macaulay.*

The Party View is, "Navy above Party." "Large sacrifices had to be made, and it is satisfactory to know that in the House of Commons there was not a hostile vote—and I think I may almost say there was not a hostile speech—against the proposals of Her Majesty's Government to strengthen the Navy. And there is this remarkable fact, of which I think we all ought to be proud, that the policy of increasing the Navy was taken out of the domain of party politics."—*Earl Spencer (Liberal) at Mansion House, 10th November, 1894.*

"I venture, with very great respect, to remind the House that naval administration is not a party question; that it never has been treated as such; and I sincerely hope that past practice will be followed in the present instance."—*Mr. Pretyma (Conservative), 7th March, 1905.*

MY last paper on the standard of strength was read on 27th June, 1904, when the present Secretary of State for Foreign Affairs was in the Chair. It dealt largely in a condemnation of the expenditure of previous years. The danger now is that we appear to be swinging to the other extreme.

In 1904 I took the unusual course of quoting in an appendix selections from the sayings of statesmen, sailors, soldiers, historians, and economists about the maintenance of our sea power. Naval supremacy is the key to all efficiency and all economy, so we need not wonder why Adam Smith placed it before free trade itself. I indulged the ambitious hope that my paper and those quotations would assist continuity of policy. In the paper the late Lord Salisbury's words were quoted: "The defence of the country is not the business of the War Office or the Government, but the business of the people themselves." If this is the case, we certainly do nothing to educate our masters. The Return of Fleets (Great Britain and

Foreign Countries), analysed in Appendix S, is about the only information handed to the public. The people lack the historic sense, and no adequate attempt is made, as is done in Germany, to cultivate it in the schools of the country. We seldom learn from history; we never look to the future. Consequently, warnings are neglected; we live in reactions from one extreme to another. And when the danger which was foreseen by a few is visible to all, we have a wasteful panic. I advocate the teaching of history as of paramount importance.

PERSONNEL.

The 1904 paper did not deal with the *personnel* for the reason that the present permanent force is certainly up to, if not beyond, our requirements. We are able now to man all existing ships without touching the Royal Naval Reserve. The tendency of invention is towards fewer ships and smaller crews. Uniform armament of heavy guns, turbines, and oil fuel all mean smaller crews, while the tendency is for the power of several ships to be concentrated into one. It is very important to remember that the chief waste of naval war is the opposite to that of land war, in that it is a loss of *matériel* rather than of *personnel*. After a few weeks or months of war we are likely to have a redundancy of men. This is most pronounced in the engine-room complements under the protective deck, more so than among the exposed executive and marine branches above. The rule is, that unless the ship sinks, there are no casualties below the protective deck. The great advantage derived therefrom is, that the fighting and navigating portions of the crew, on the one side, and the engine-room on the other, can specialise in their difficult and widely separated spheres of work.

The country that brings this specialisation to its highest pitch of efficiency is the one that will make the best use of its *matériel*. Like battles, the approaches to perfection are only to be won by a lifetime's concentration, and not by dispersion of effort. One word more with reference to this subject. No system of training the *personnel* is likely to be successful which does not carry with it, if not the enthusiastic support of the Navy, at least the support of the great majority of the officers of that Service. I have now stated the conditions of the problem, and on those conditions we must judge the relative merits of the German system and the one we are about to introduce afloat from Dartmouth, and from the ships for training stokers as mechanics and watchkeepers. How, then, are we to get the best intelligent opinion of the Service on this as on all other matters? It is only by full and impartial inquiries, by untrammelled discussions in this Institution, or by the three P's—Press, Parliament, and Platform. A wise administration of the Admiralty should endeavour to bring these things to pass with a view to facilitating its own work.

DISTRIBUTION OF SHIPS.

To secure efficiency, not only is concentration required inside the unit ship, but there must be a concentration of units themselves in large fleets in such a manner as to reproduce as nearly as possible the conditions of war. Sea training in association with large fleets of the most modern vessels is the ideal; and it is from this point of view that any redistribution scheme must be judged. A country

which has no second line of defences must necessarily keep her only defence in a state of greater preparedness than the sea forces of nations who are well able to defend themselves on shore. At the same time, no nation should be pressed to keep the whole Navy in peace on a war footing.

The difficulties of the Government next February, when they carry out their redistribution scheme, will be of their own seeking. They elected to state in a memorandum that an increase of efficiency results from reducing two sea-going fleets to small units in order to constitute a Home Fleet which is not to be fully manned, and from cutting down cruiser squadrons to only four vessels each, when experience shows that spreading practices with wireless telegraphy and searchlight signalling can only be efficiently exercised when six vessels take part. They claimed that a gain in strength would also be obtained from keeping certain older ships in the sea-going fleets, while the "Dreadnought" and several other modern vessels are in the Home Fleet at Sheerness. The enunciation of such principles is subversive of the whole spirit of fighting Navies. The *Standard* announces that a number of battle-ships and armoured cruisers are to be placed in special reserve, or in the class on which no further repairs are to be executed. The neglect of obsolescent ships is justified if considerable attention is devoted to new construction. If a nation is too poor to keep up a policy of replacement of old ships, she must, above all things, make the best of what she has got. She cannot have it both ways. (See Appendices J, K, L, M, for wastage and replacement tables.)

FORECASTS.

There were three forecasts in my paper in 1904. One was that the two-Power standard had not more than five years lease of life. The Prime Minister last July described the standard of France and Germany, and by inference that of either Power with the United States, as a "preposterous idea." The two-Power standard is spoken of as "a rough-and-ready guide," and this prompts the suspicion that an elastic standard is intended, and; when it can no longer be stretched, it will be broken. The second forecast was, that by careful attention to standardisation and organisation it would be possible to build ships in under two years instead of three years two months, as we were taking then. The other forecast I made was the expression of my hope that the cost of a battle-ship would "rise considerably all over the world to about two millions sterling for each battle-ship." Subsequently the "Lord Nelsons" were laid down, to be followed by the "Dreadnoughts." One can only say now that the policy of initiating this development in ships is dependent for success on the courage with which it is pursued. There is an apparent lack of both courage and caution in the reductions to which the country has recently been pledged. The reductions for next year are held out as an example to the Peace Conference. One may safely venture on a fresh forecast, that no gain in the direction of disarmament will result from this Conference.

THE PEACE CONFERENCE.

My 1904 paper pointed out the danger of Great Britain taking the initiative in a Conference for the limitation of naval armaments.

The House of Commons this year passed a resolution calling on the Government "to take drastic steps to reduce the drain on national income, and to this end to press for the inclusion of the question of the reduction of armaments by international agreement in the agenda of the forthcoming Hague Conference." It was accepted by the Government as a message to foreign Powers. Analyse it from this novel point, read the preliminary wail about the expenditure being more than we can sustain, and then imagine such a document handed to Prince Buelow! What conclusion can we come to but that it was a tearful begging letter to the nations that Great Britain was at the end of her tether, and would they be so kind as to get us out of our difficulties? It is unnecessary to restate the objections urged in my paper, for the whole subject has been much more fully threshed out in both Houses of Parliament; but it is permissible to point out that everybody is willing to discuss the question of disarmament. I hold, however, that the initiative ought not to be taken by Great Britain.

WASTEFUL DUPLICATION OF EXPENDITURE.

In the 1904 paper it was pointed out how the Army tended to do over again the Navy's work.

What is sometimes called a second line of defence is really a duplication of expenditure and the dispersion instead of concentration of fighting force. This was the direction in which economy was urged. To everything the question was to be addressed: Are you vitally necessary or are you merely supposed to be useful? Only what is vital should be kept. Bases and forts could be abandoned, garrisons cut down, and the Army and Militia organised for service abroad. The economy could, however, only be achieved through the certainty of naval supremacy. That is to say, no mere equality with an enemy would suffice, but we must have a safe working margin of superiority. An official return obtained by Sir John Colomb in 1903 showed in round numbers that 14½ millions sterling per annum went to immobile defence. Of this amount nearly 10 millions was for the forts along our 43,000 miles of coast line. Reckoning interest on first cost, manning, stores, repairs, and replacement for a 20 years' life, the £2,000,000 battle-ship would cost £250,000 per annum. Two millions would therefore give us eight extra "Dreadnoughts," and with them Sir Arthur Wilson could have cornered his opponent last manœuvres in less than a week. That is with one-fifth of the sum now spent on defending ports, many of which nobody would dream of attacking.

ARMY POLICY.

One thing, however, is certain. We cannot have it both ways. We cannot abandon shore defences against invasion and at the same time weaken the Navy that makes the economy possible. Let us take stock of the new responsibilities thrust upon the Navy as the result of the Blue-water School's triumph:—

1. Mr. Brodrick's Army scheme originally provided for 435,000 men to defend us against invasion.
2. In 1905 Mr. Balfour postulated for a military force to overcome an invasion of 70,000 men.
3. In 1906 Mr. Haldane accepted blue-water principles and threw the whole responsibility of protecting the country against invasion on the Navy.

AN IMMEDIATE STRIKING FORCE.

Mr. Haldane's memorandum of 30th July says:—

“To sum up, the Government's proposal is that effort shall in future be mainly concentrated on the production of an expeditionary force *immediately* available for use over-seas in war.”

Obviously such a force cannot cross the seas in war except under the protection of a predominant Navy, and one whose predominance exists under the military policy of the Government from the very outbreak of the war. For the same reason even our land frontiers, such as the 5,700 miles of Indian frontier, must be prepared at inordinate cost, unless the Navy can guarantee reinforcements. Yet the same day as Mr. Haldane issued his memorandum, Lord Tweedmouth explained in the House of Lords that the naval reductions were made because he brought before the Sea Lords the necessity of economy! The result was not a mere return to the normal, following on inflated Estimates; it was a reduction on top of a reduction. We were the only Power throughout the world that had diminished naval expenditure after 1904, in our case to the extent of five millions sterling. To achieve this we cut down stores and repairs, and framed a minimum programme of four armoured ships. (See Appendix A.) Then, having lost the “Montagu,” having seen new programmes sanctioned by France and Germany in the spring, having multiplied the military responsibilities of the Navy indefinitely,¹ we are promised huge reductions of the naval programme for two years, carrying us far below the combined shipbuilding expenditure of either Germany and the United States or Germany and France. (See Appendix Y.)

EXPENDITURE.

I doubt whether it is clearly understood where these naval reductions are carrying us. All expenditure on armaments is relative. In the three years ending 1907-8 the relative increase of the German Navy Estimates, compared with our own, will be at least ten millions sterling. (See Appendix Z.)

Anyone acquainted with the temper of the majority in the present House of Commons knows that the reductions are looked upon as permanent. The Socialist view is that the money is to be permanently used for social reform, and the official Liberal view is to apply it to the relief of taxation. Consequently, if our Navy Estimates are to stand still at the position of 1907-8, we have to take into consideration the further rise of the German Estimates provided for of £1,534,000 by 1909. Here, then, is a relative increase of 11½ millions sterling.

¹I do not wish to burden the paper with too much detail, but it should be mentioned that we have recently withdrawn the troops from the West Indies, Halifax, Esquimaux, Trincomalee, St. Helena, and Wei-Hai-Wei. We have reduced the garrisons at Gibraltar, Malta, Mauritius, and elsewhere, abandoned systems of defence by submarine mines and Brennan torpedoes, and withdrawn dockyard stores and machinery from several over-sea yards. The Admiralty have officially explained that “if war broke out we could *at once* send out the necessary men and machinery.” Of course, under protection of the reduced Navy.—C.B.

From the point of view of the two-Power standard, there are no compensations to be found elsewhere, either in France or the United States, for both nations are largely increasing their Estimates, while our own are decreasing. Since 1904 the American naval expenditure has increased by £5,416,000, and the French by nearly half-a-million sterling, with the bulk of the increase to come next year. It cannot be contended that our example has had happy results. In Appendix Y it will be seen that our expenditure on shipbuilding, repairs, and armaments is likely to fall $3\frac{1}{2}$ millions sterling below the combined expenditure of France and Germany on the same items. In 1893, under Mr. Gladstone, we had a new construction expenditure £2,210,000 lower than France and Russia. What was the result? In 1894 the biggest programme on record, and a new construction expenditure in 1896 of £7,327,000, or $4\frac{1}{2}$ millions more than in the year of economy.

THEORIES ON WHICH REDUCTION IS DEFENDED.

It is now time that we examined the arguments which have been advanced in favour of reduction. I know of no more foolish contention in our naval discussions than the plea which has been advanced by civilians like Lord Eversley, that tonnage is an accurate measure of fighting strength. On this ingenious and almost childish theory Lord Eversley arrives at the conclusion that all our "Royal Sovereigns" are first-class battle-ships, and that Germany has no first-class battle-ships built or building. Compound armour being such that it takes 5,000 tons to give the same results as 2,000 tons of Krupp armour; still the extra 3,000 tons is so much extra fighting power. So with the thousands of extra tons of coal and wood sheathing carried by our ships. The "Asama" of 1893, which did so well in the recent war, is to be reckoned the inferior of the "Kent," because, forsooth, she is 100 tons less displacement; yet she carries two inches more of armour and mounts two extra 8-inch guns. The tonnage theory, which has never been advanced by a responsible naval officer, amounts to this, that we are to add up the mistakes of the past on the balance side as though they were miracles of common sense, and we are to go into action with as vast an aggregation of tonnage as the Russians did at Tsushima. I may tell these gentlemen that in naval administration, as in the administration of private affairs, the great art is to cut one's losses, and in that class we must reckon many thousands of tons of so-called war-ships.

THE MARGIN OF SAFETY.

There is another maxim in business, and that is, always to work with a margin of safety. I have seen only one sensible argument for a weakened Navy. It is, that on the day of battle a single Power has an undoubted tactical advantage over allied Navies. The view, however, neglects strategical considerations. Supposing a war with France, Germany intervenes. Can we neglect the North Sea because we are fighting another nation in the Mediterranean? The provision of force has to be the same as if we were fighting two fleets of the same nation. What the advocates of naval reduction never realise is, that the problem of naval war for Great Britain is essentially different and more difficult than that presented to con-

tinental nations, such as the United States, Germany, France, or Russia, to whom sea-power is not a vital necessity. For Great Britain must keep open all her sea roads by a continuous occupation of the sea, so as to prevent the arrest of her commerce and industry through sudden and violent incursions of the enemy. For perhaps 360 days out of 365 in the year, she must go on with all the difficult drudgery of absent ships coaling, refitting, convoying, the heartbreaking accidents of navigation, and all the vexatious precautions of the sea which are not fighting, but which are yet essential to the avoidance of disaster, when the day for fighting comes.

INTERNATIONAL LAW AND NEUTRALS.

It is for the reasons I have mentioned, chief among which is the coaling difficulty, that it is an accepted maxim among foreign strategists that 30 of their battle-ships are the equivalent of at least 40 British battle-ships. Hitherto, we have always hoped that the coaling difficulty would seriously curtail the power of commerce destroyers to evade our own cruisers. The declarations of the Powers during the recent war, and the actual coaling of the Russian ships, have not shown such a rigid interpretation of neutral obligations as we had anticipated. Our only hope, beyond the Hague Conference, lies in our own strength in cruisers, and I commend to your study the remarks in Appendix V. At the same time, let me strongly insist that questions with neutral Powers will be apt to arise with even more frequency than in the past, and as a belligerent we cannot hope to impress our views unless we have a reserve of strength as when we sent a fleet to Copenhagen without diminishing our blockading fleets. The reserve of strength is not only the visible means which strengthens our diplomacy during peace, so that peace tends to be preserved, but it is the only means we have when beset by war's difficulties, of maintaining a firm front in face of neutrals. It is only a few months ago that our whole Mediterranean force was ordered to overawe a nation without any Navy at all.

LOSSES DUE TO NAVIGATION.

The past cannot teach us much about the coaling difficulty, to which we have referred, except in so far as incidents connected with provisions and water bear on the matter of supplies as when Nelson parted with six of his battle-ships the day before Trafalgar. History, however, can tell us much concerning losses through accidents which are not due to battle. The ordinary losses through accidents of navigation were abundantly illustrated prior to the battles of St. Vincent, the Nile, and Copenhagen.

Between 1793 and 1802, or a period of 9 years, we lost through causes other than war, 64 sail of the line and frigates, as compared with 19 for the allies, France, Spain, and Holland, or over four to one. Even now, when British ships do not spend more than a quarter of their time at sea, we find such incidents as over half the Mediterranean battle-ships unavailable on receiving the order to proceed east for the coercion of Turkey, and after delays, only five out of the eight battle-ships were on the scene of possible hostilities. Within the last few months we have had the deplorable loss of the services for a time, or for all time, of the "Montagu," "Duncan,"

"Dominion," "Prince of Wales," "Hindustan," and "Ramillies," while four other battle-ships had to part company from their fleets in the manœuvres through engine-room defects. The "Africa" was nearly piled up on the "Lizard" in a fog. The "Prince George," "Renown," and "Mars" grounded, the "Dreadnought" damaged when entering Portsmouth basin, and the "Illustrious" in collision, complete the list of minor accidents for the year to our battle-ships. Other battle-ships, like the "Glory" and the "Ocean," have been a perpetual drag on their fleets.

INVENTION.

It is invention which enhances the need of constant watchfulness as to the maintenance of our naval supremacy. The mere introduction of turbines with their large consumption of coal means that ships will be oftener absent from their fighting positions, while water-tube boilers need more constant renewals. Turbines have suddenly increased the speed of all new commerce destroyers, as against all our existing cruisers with reciprocating engines. The accuracy and rapidity of modern gun-fire, enabling particular portions of the hull to be hit successfully, and the development of shell-fire has made the unarmoured ends of 34 out of 60 British battle-ships, the Achilles heel of the British Navy. (*See Appendix B.*) The German North Sea Fleet of 16 battle-ships, will have, for instance, 256 quick-firing guns, 6-inch and above, as compared with 158 in the secondary batteries of the 14 battle-ships in the new Channel Fleet, and though we have put the nine available battle-ships which have complete belt protection into the Channel, there are still left five with unarmoured ends for 256 guns to play upon.

Wireless telegraphy assists us provided there are enough vessels carrying the instruments, so as to spread our net as widely as possible. (*See Appendix V.*, dealing with the Admiralty statement virtually admitting that if we do not at once lay down a number of cruisers we shall have only the 3 "Invincibles" and 35 armoured cruisers at our disposal as cruisers.)

The gyroscope has undoubtedly increased the range and accuracy of torpedoes, so that 4,000 yards' range is now almost practicable, and consequently, the risks to ships, the need of both a margin of safety in numbers of armoured vessels and of destroyers, to make it hot for the enemy's torpedo craft, has been increased. (*See Appendix W*, dealing with destroyers.) The advocacy in Germany of the practice of the Russo-Japanese War, of laying mines on the open sea, introduces a factor in the North Sea by which Japan lost one-third of her battle-ship strength in the recent war. It is to be hoped that the Hague Conference will settle this point, which is of far more importance than wasting our efforts after unattainable ideals.

RELATIVE STRENGTH.

I now come to the most controversial part of my paper, our actual relative strength judged by the rule Lord Cawdor says has existed for years at the Admiralty, of a very large superiority in cruisers over any two Powers, and a ten per cent. margin of superiority in numbers of effective battle-ships over any two Powers. In the Appendix I have had recourse to almost every authority, and to a

number of comparisons of my own. In every case I find that when we allow for ships building and projected, we are falling below the two-Power standard. The most interesting tests are those according to age (Appendix I.), and the test by gun armaments measured by the capacity of the guns to fulfil their office of breaking down the armour of an enemy's ship. (Appendix H.) I have left out the United States in the case of the guns, for if included as one of the two Powers we should be hopelessly below the standard. The table is open to criticism, on the ground that it makes no allowance for any superiority of gun platforms. It is only when taken in conjunction with other data in the Appendix that I believe we find overwhelming evidence that the reductions of our shipbuilding programme for next year are not justified.

CONSIDERATIONS GOVERNING POLICY.

Ruling out the United States for purposes of argument, we are left with France and Germany to consider. In Appendix D it is shown that the speed at which individual ships are built in Germany is level with our own. On the other hand, French shipbuilding has been so demoralised by Socialistic interference that if ships are laid down now, or, say before next March, we need not provide for them until our programme of 1908-9. The limitation to this argument is, that it is grossly extravagant for us to lay down three ships one year and nine the next. I propose now to see how we stand in regard to the opinions of the expert advisers of the nation as enunciated when they laid down our *minimum* requirements last November. Their calculation was based on the ships then building in France and Germany. In that year, 1905-6, we had laid down four armoured ships to three for Germany and none for France. In the spring of 1906, Germany sanctioned an additional armoured ship; while in July we postponed ~~one~~ the armoured ship, owing, as Lord Tweedmouth has told us, to his impressing on the Board the need of economy. The day after Parliament adjourned, the Admiralty announced the complete loss of the "Montagu." Thus, apart from any question of replacing the five "Admiral" class which have been set aside this year, or the fourteen battle-ships which are about to follow the "Admiral" class in that dismal procession of veterans to the graveyard, we have three armoured ships to build in the programme of 1907-8.

As Germany builds as fast as we do, and, except in the present year (1906), has invariably laid down her programme before our own, we must, in our programme for 1907-8, add in her provision of 3 armoured ships for 1907-8. This makes 6 armoured ships for 1907-8, instead of the 3 we propose to lay down, or 7 if we desire to have any margin. In 1908-9 we have Germany's provision of 3 armoured ships to consider, and the French programme of 6 armoured ships, sanctioned this year, which will, by that time, be well advanced; in other words, 9 armoured ships, for which 10 must be laid down to give us a margin. The programmes then would be:—

1905-6	...	...	...	...	4 armoured ships.
1906-7	...	...	...	...	3 " "
1907-8	...	...	...	...	7 " "
1908-9	...	...	...	...	10 " "

There remains 1909-10, for which Germany will again lay down 3 armoured ships. If, now, we assume France lays down no additional armoured ships for 1907 or 1908, we can be content with 3 or perhaps 4 armoured ships in 1909-10. These are great fluctuations, whereas an average of the whole of these programmes for the five years gives five armoured ships per annum—a figure that exactly corresponds to the average wastage of our armoured ships given in Table M. It does not realise the ideal of those who advocate laying down two ships for each one Germany starts, which was, as Sir Edward Grey has pointed out, our old policy in regard to France.

I leave it to the meeting to judge whether it is better to have a steady output, as in Germany, giving regular employment, or a scare programme in 1908.

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APPENDICES.

A.—THE REDUCTIONS ANNOUNCED 27TH JULY, 1906.

The extent of the reductions for two years is best shown in tabular form, as the statement has been repeatedly made that the amount is small:—

	Original Programme for 2 years, 1906-8.	New Programme for 2 years, 1906-8.	German Programme for 2 years, 1906-8.
Breadaughts	8	5	4
Armoured cruisers	0	0	2
Scouts	1	1	4
Ocean-going destroyers	5 + ?	2 + ?	21
Enlarged torpedo-boats	12 + ?	12 + ?	mil.
Submarines	12 + ?	8 + ?	1
Approximate liability	£18,850,000	£12,600,000	—

(The above compares with an outlay of £21,146,000 for 1903-5. If the Hague Conference is deemed to have failed, one more armoured vessel will be laid down.)

B.—BATTLESHIPS.

Unarmoured Ends.

As this question is one of the gravest that can possibly come before the country, it is necessary that every civilian should understand that the phrase means no armour protection to the bow and stern at the water-line, so that shell-fire can tear huge holes. The following analysis in respect of armour protection to the water-line deals only with ships classed as first-class in the official return:—

France and Germany.—Complete belts for all battle-ships.

Great Britain.—34 first-class battle-ships have both ends unarmoured.

13 have unarmoured sterns.

13 most modern have complete belts.

At the battle of Port Arthur the "Poltava" was put out of action by a hit on the unarmoured bow.

At the battle of Tsushima, Russian battle-ships with unarmoured parts in contact with the waterline were sunk by gun-fire. After the receipt of all our Naval Attachés' reports on the battle of Tsushima, the memorandum on Admiralty Policy was issued last November on the advice of the present Sea Lords. In it is the grave statement that if £2,000,000 were spent on the armaments, etc., of the "Admiral" class of battle-ships, their unarmoured ends would still leave them vulnerable to a second-class cruiser.

C.—DISPERSION *versus* CONCENTRATION.

Figures for 1906 to show the dispersion of British force abroad. In 1902-3 the Navy reached its maximum of dispersion. The degree of dispersion is dependent on policy, and the more fortunate state of affairs, in 1906 and 1907, cannot be expected to last indefinitely:—

	At Home on Commission or Reserve.	Abroad.	Cruising.
Battle-ships	29	16	—
Armoured cruisers, including "Power- ful" and "Diadem" classes	20	15	—
Large protected cruisers	10	8	10
Small protected cruisers and scouts	18	15	—
Destroyers	95	47	—

(The following addition has been made subsequent to the lecture.)

In a criticism on the lecture in a paragraph dealing with the distribution of ships, *Engineering* says, of the ships with nucleus crews on board, that "experience has shown that upon orders being issued suddenly during the night, three hours sufficed for the vessel to be made ready to depart for war." I immediately took steps to ascertain the position, at the nearest dockyards to the North Sea, Chatham and Sheerness, which would furnish the nearest force, the Channel Fleet being at Vigo. There was not a single ship in full commission outside Chatham Basin except the cruiser "Black Prince." The old battle-ships "Magnificent" and "Royal Oak" also lay in the Medway with nucleus crews on board, as also two protected cruisers, two torpedo gun-boats, twelve destroyers, and five torpedo-boats. In Chatham Basin there were crowded the following:—

Battle-ships.

Ships in full Commission.	Ships with Nucleus Crews.
"Africa."	"Albion."
"Ocean."	"Ramillies."
"Albemarle."	"Repulse."
	"Resolution."

Armoured Cruisers.

"Roxburgh."	"Bedford."
"Sutlej."	"Leviathan."
"Cumberland."	

Protected Cruisers.

"Dido."	"Amphitrite."
"Leander."	"Andromeda."
	"Argonaut."
	"Blenheim."
	"Charybdis."
	"Edgar."
	"Scylla."
	"Thetis."

Scouts.

"Pathfinder."	"Adventure."
	"Attention."

18 destroyers.

6 torpedo-boats.

Torpedo Gun-boat.

"Speedwell."

Engineering leads the public to believe that these ships can get to sea in three hours. What are the facts? The ships could not possibly assemble in the Medway in under a week, even if they have the luck to escape fogs. Only two large ships can go out of Chatham Basin at one tide, and the river is not lighted for pilotage at night time. The Atlantic Fleet is dispersed at the three dockyards with half the crews on leave.

It is in face of this state of affairs that the public are led to believe that in the event of a sudden crisis the ships could be assembled in overwhelming force in three hours.

Another point that needs emphasising is, that both with nucleus crews and two year commissions a large number of crews are in an imperfect state of training. Thus, out of our 60 nominal first-class battle-ships, only 26 have been in full commission for the whole of 1906, and of our 38 armoured cruisers built, or building, only 14 have been in full commission for the whole of this year.

				1891.	1906.
Number of fighting ships abroad	...	...	...	60	127
" armoured "	...	...	...	17 out of 73	31 out of 77

Practically the whole German Navy is concentrated in easy reach of the North Sea.

D.—RATE OF BUILDING.

From date of laying down to date of completion for commissioning:—

No.	Class.	Year Commissioned.	Average time the whole Class took to build.	
			Years.	Days.
2	Barfleur	1894-5	3	135
1	Renown	1897	4	127
7	Royal Sovereign	1893-6	4	78
9	Majestic	1895-8	2	292
6	Canopus	1899-1902	3	257
8	Formidable	1901-4	3	202
6	Duncan	1903-4	3	363
5	New Zealand	1905	2	310
6	Cressy	1901-4	3	261
4	Drake	1902-3	3	216
10	Monmouth	1903-4	3	170
6	Devonshire	1905-6	3	47
Worst battle-ship on record: "Royal Oak"			5	250
Worst cruiser on record: "Spartiate"			5	311

It will be seen from the time taken over the small "County" class of cruisers that the question of the displacement of a vessel exercises little influence on the time taken to build.

The following official figures as to German first-class battle-ships may be usefully compared with the above table, as showing that we possess no inherent advantage in the rapidity with which the annual naval programme can be completed:—

Ship.	Programme.	Date laid down.	Date completed.	Time occupied in building.	
				Years.	Months.
Kaiser Barbarossa	1898	Aug., 1898	May, 1901	2	9
Wettin	1899	Oct., 1899	Oct., 1902	3	0
Schwaben	1900	Nov., 1900	Dec., 1903	3	1
Braunschweig	1901	Oct., 1901	Sept., 1904	2	11
Preussen	1902	June, 1902	July, 1905	3	1
Deutschland	1903	May, 1903	June, 1906	3	1

German ships are not regarded as completed until after the committee on war-ship trials have finished their task, and left the ship for good. It is noticeable that the German ships are laid down in the year of their programme, instead of being delayed into the following year, as is so frequently the case with our ships.

E.—THE NAVIES IN 1917.

The United States, like ourselves, has no fixed programme for a number of years ahead, but she can always be relied on to keep ahead of Germany, especially as she has to distribute her ships between the Pacific and Atlantic.

Both France and Germany have mapped out programmes to the year 1917, but whereas that of Germany is settled, the one for France is subject to capricious changes. The following table gives the state of navies if the programmes are adhered to:—

	France.	Germany.	Two-Power Standard.
First-class battle-ships	34	33	50 (10% margin)
Armoured cruisers	19	20	50 (25% ")
Scouts and small cruisers... ..	6 + ?	33	?
Destroyers	109	148	?
Submarines for attack	82	?	?
Submarines for defence	49	?	?
Torpedo-boats	170	?	?

Counting all vessels laid down in 1900, and subsequently as efficient in 1917, we shall have 19, leaving 61 to be laid down in the ten years, 1908-17, inclusive. That is to say, to keep up the two-Power standard we should require 6 "Dreadnoughts" per annum, at least one armoured cruiser, and other cruisers. The possibilities of economy lie in any inability of France to face the expenditure necessitated by the above programme. The calculations of France and Germany are admittedly based on the idea that some ships laid down prior to 1900 will be reconstructed. Should Great Britain abandon her present policy of abstaining from all efforts at reconstruction, then the lives of vessels will be prolonged and ships laid down before 1900 can be included. The hesitation about reconstruction is due to the inherent defect of unarmoured ends in these vessels. (*Vide* Table B, and Cawdor Memo. of 1905, p. 31.)

F.—YEARS OF ANXIETY.

The three most recent years in which there has been great anxiety about the future position of the Navy were 1888, 1894, and the present year. The following table gives our position in each year, according to official returns with the following alterations:—

1. Return No. 12, June, 1888, No. 218.—All wood hulls have been excluded, as well as six British battle-ships requiring large repairs.
2. Return No. 129, 24th April, 1906.—Vessels not being maintained are excluded. The French armoured cruiser "Vauban" has been excluded from this list, and all

French and German unprotected cruisers. The "Royal Sovereign," "Nile," "Trafalgar," "Centurion," "Barfleur," and the "Renown," used as a yacht, are included, though it is freely rumoured that with the exception of the "Renown," it is not the intention to spend any more money on maintenance.

Built and Building.	1888.			1891.			1906. (Built, building and projected).	
	Great Britain.	France + Russia.	France + Germany.	Great Britain.	France + Russia.	France + Germany.	Great Britain.	France + Germany.
Battle-ships.								
1st Class ...	41	26	29	22	25	22	57	57
2nd Class ...				12	21	20	0	13
3rd Class ...				11	6	12	0	10
Coast-defence vessels of over 2,000 tons and more than one heavy gun.	11	19	8	15	20	6	0	3
Armoured cruisers	12	9	2	18	20	9	33	32
Other cruisers ...	77	74	85	113	67	91	71	71

So far as this table affords any indication, it is that our position is at the least about to become as bad as in 1888 or 1894, when the Chambers of Commerce took action.

G.—PROGRAMMES.

It may be said that our large superiority in older ships, owing to the building efforts up to 1900, kept us at the two-Power standard until 1905 or 1906. With the advent of entirely new types with much heavier armaments, it becomes dangerous to rely on these old types, especially as we have seen they have all got unarmoured ends. The following table shows the programmes of the Powers in first-class battle-ships:—

	1900	1901	1902	1903	1904	1905	1906	1907	Total.
Great Britain (28) ..	2	3	2	3	4	1	3	2	20
Germany (13) ...	2	2	2	2	2	2	2	2	16
United States (15) ...	2	0	2	5	1	2	1	2	15
France (10) ...	2	0	4	0	0	0	3	3	12

Thus our total of 20 battle-ships compares with 31 for Germany and the United States, and 28 for France and Germany.

The figures in brackets show the number of first-class battle-ships which will be less than 18 years old at the end of 1907, which are not included in the above table of programmes.

As regards "Invincibles," of which so much has been said, we shall have three in 1910, to two for Germany, two for the United States, and none for France.

It may be contended that we should classify in "Dreadnoughts"; battle-ships with 8-inch guns and above in their secondary armaments; and lastly battle-ships of earlier types.

Our table then reads as follows:—

	Fighting equivalent of Dreadnoughts.	Intermediates.	Earlier Types.
Great Britain	8 ¹	8	4
Germany	4	Nil.	10
United States	5	13 ²	Nil.
France	6	Nil.	6

¹ Includes two "Lord Nelson's."

² Includes three intermediates, not in the first table, the United States having initiated the policy.

This still leaves us well below the two-Power standard in the future, but it improves the position considerably as against Germany. Two of our "Dreadnoughts" will not be laid down until March, 1908, whereas all four for Germany will then have been building for some time, and Germany will, in June or July, 1908, lay down two more not included in the above table. These two will, however, be ready in 1910, and it is the position that year which should dictate our 1906-7 and 1907-8 programmes.

H.—COMPARISONS BY GUNS.

Strength, according to the efficiency of guns mounted in battle-ships or coast-defence vessels. Only guns of a theoretical perforation of 7 inches, or more of the best armour at 5,000 yards, with capped projectiles, according to the gun tables in Jane's "Fighting Ships," are included in this list, and it includes battle-ships to be laid down in 1906 and 1907. It is assumed from the Press reports that the German battle-ships will carry sixteen 11-inch guns, and corrections must be applied if wrong:—

Theoretical perforation of } Armour at 5,000 yards. }		17½" to 18"	14" to 16"	11" to 13"	7" to 10½"
France	40	16	110	64	
Germany	64	—	40	40	
France and Germany...	104	16	150	104	
Great Britain	48	84	40	40	

(In March, 1908, according to programme, 20 British guns, or possibly 30, will be added to column (1), making 68 or 78 guns capable of perforating 17½-inch armour.)

It should be distinctly understood that a very large number of British battle-ships have no armour at the water-line on the bow or

stern, and the large secondary armaments in German battle-ships, of which the above table takes no account, were given for the special purpose of sinking these battle-ships by rapid shell fire directed at their unarmoured ends.

I.—STRENGTH ACCORDING TO AGE OF BATTLE-SHIPS.

Sir Henry Campbell-Bannerman:—"Are none of the ships of the other Powers obsolescent?"—House of Commons, 27th July, 1906.

All first-class battle-ships built or building on 31st December, 1907, less than

Nation or Combination.	23 years old.	18 years old.	13 years old.	8 years old.	Laid down or projected 1905-7.
Great Britain	58	52	37	19	6
France and Germany	51	49	41	28	12
Germany and United States (a) ...	56	55	48	32	10
France	23	22	17	12	6
Germany	28	27	24	16	6
United States (a)	28	28	24	16	4
France, Germany, and United States (a)	79	77	65	44	16
British force as a Percentage of the three Powers	p.c. 73.4	p.c. 67.5	p.c. 56.9	p.c. 43.2	p.c. 37.5

(a) Does not include any programme for the United States in 1907, but four battle-ships are contemplated, and if this is correct, four should be added to each column for United States.

The rapid reduction in the British proportion of first-class battle-ships as we discard those laid down previous to 1895, is explained by the following table, from which the "Montagu" is, of course, excluded. The table shows first-class battle-ships laid down by the Powers in the quinquennial periods named, and in a final period, 1905-7, gives the ships building or projected for those three years:—

	1885-9.	1890-4.	1895-9.	1900-4.	1905-7.
Great Britain	6	15	18	13	6
France	1	5	5	6	6
Germany	1	3	8	10	6
United States	Nil.	4	8	12	4 (a)

(a) Does not include any programme for the United States in 1907. As stated elsewhere, four battle-ships are contemplated.

The old ships that are used to swell the table of British ships are a danger and a delusion. We have in the Returns of Fleets (Great Britain and Foreign Countries) eight so-called first-class battle-ships launched prior to the Naval Defence Act; France has seven, and Germany none. Of the seven French battle-ships, six had been reconstructed and the seventh is in hand. Of the eight British battle-ships, the "Nile" and "Trafalgar" are still maintained, and none of the ships have been reconstructed. The "Nile" and "Trafalgar" have undergone alterations to their secondary armaments. The

"Sans Pareil" and the five "Admiral" class have had a total sum of £1,489 spent on them during the last 18 months. After months of pretence concerning these vessels, the admission was obtained from Mr. Robertson on 7th November that "the expenditure (£1,489) was not for the purpose of maintaining the ships in a state of readiness for war, but with a view to their upkeep pending removal to the sale list next year."

We have reduced the Royal Dockyards by 8,676 men during the last five years, and of these nearly 7,000 went last year. Similar reductions have taken place at Woolwich and the private yards. The causes can be sought in the following four tables:—

J.—NUMBER OF SHIPS UNDER CONSTRUCTION.

Ships of over 5,000 tons under construction for the Royal Navy on the 1st April, 1900, to 1st April, 1906, inclusive:—

Years.	Battle-ships.			Cruisers.			Grand Total.
	Dock-yards.	Con-tractors.	Total.	Dock-yards.	Con-tractors.	Total.	
1900	8	7	15	4	12	16	31
1901	10	6	16	8	15	23	39
1902	7	5	12	9	13	22	34
1903	6	6	12	8	14	22	34
1904	7	5	12	7	8	15	27
1905	4	4	8	7	9	16	24
1906	4	2	6	4	7	11	17

Average numbers under construction for 7 years = 30

Anticipated numbers under construction on completion of three "Invincibles" and after laying down the new ships at the end of the financial year, 1907-8 = 6 (Of these, two may be building in the private yards.)

K.—BATTLE-SHIPS BUILDING AND PROJECTED ON 1ST APRIL, 1901 AND 1906.

	1901	1906	Present day.
Great Britain	19	9	6
France and Germany ...	15	20	19
France and United States	15	25	21
Germany and United States	22	21	16

In 1907 Germany will lay down two additional battle-ships and the United States probably two.

L.—WARSHIPS BUILDING IN UNITED KINGDOM FOR ALL COUNTRIES.

The following table has been kindly furnished by Lloyd's Register of Shipping:—

Number and displacement of war-vessels under construction in the United Kingdom at the end of September, 1897-1906, according to

the Returns published by Lloyd's Register of British and Foreign Shipping:—

	No.	Tons.		No.	Tons.
1897	87	318,612	1902	58	303,202
1898	92	376,435	1903	64	327,570
1899	82	412,980	1904	67	342,930
1900	69	427,885	1905	42	264,310
1901	50	375,045	1906	47	203,345

The maximum reached was in March, 1900, when 450,000 tons were in hand.

M.—THE WASTAGE LIST.

Ships of over 4,000 Tons Removed from the List of War-ships being Maintained.

	1900	1901	1902	1903	1904	1905	1906
Battleships	3	7	1	6	—	4	8
Coast Defence Ships	1	2	—	—	1	1	—
Cruisers, 1st Class	6	2	—	—	3	6	—
Cruisers, 2nd Class	2	0	1	1	1	5	—

Average Wastage per annum, Battle-ships and Coast-Defence Vessels ...	5
" " " Cruisers of over 4,000 tons	4

In the 14 years ending 1902 we built at the rate of 3 battle-ships and 7 cruisers per annum. Taking armoured cruisers only, in six years ending 1902 inclusive we laid down an average of $3\frac{1}{2}$ battle-ships and $4\frac{3}{4}$ cruisers, or 8 armoured vessels a year. Last year's programme was for 1 battle-ship and 3 cruiser-battle-ships, this year for 3 battle-ships, and next year for 2 or possibly 3 armoured vessels.

N.—THE NAVAL ANNUAL.

Deducting the "Montagu," the Naval Annual gives the strength in first-class battle-ships as follows:—

	Great Britain.	Germany.	France.	United States.
Built	44	18	11	} 27
Building	6	6	6	
Projected 1906-7	3	2	6	
	53	26	23	27
		49		

United States and Germany = 53.

Ten per cent. margin over next two Powers requires 58 battle-ships for Great Britain; actual number, 54. The United States Navy Department propose to increase the original programme of 1906 by two battle-ships, in which case the two-Power standard requires us to have under Naval Annual classification 61 battle-ships instead of 53.

O.—ESTIMATE FROM "FIGHTING SHIPS."

(Includes Cruisers.)

Rate.	Great Britain.	United States + France.	United States + Germany.	France + Germany.
I.	4	3	3	Nil.
I.—II.	2 } 17	6 } 28	2 } 18	8 } 14
II.	11	19	13	6
III.	21	9	19	14
IV.	15	13	3	10
V.	20	19	25	20
V.—VI.	8	15	8	15
VI.	13	17	10	17
VI.—VII.	8	8	2	6
VIII.	Nil.	3	14	16

The remaining vessels belong to the "Blake" period, and protected cruisers or obsolete vessels.

P.—THE NAVAL POCKET BOOK.

Great Britain's position relative to that of any two Powers:—

Battle-ships launched in or since 1895 of 12,000 tons or upwards	+	6
Battle-ships over 8,000 and under 12,000 tons launched since 1887	-	6
Other battle-ships and Sea-going Coast-defence ships	-	19
Armoured Cruisers, most powerful types	+	5
Armoured cruisers of over 6,000 tons, built since 1890 and not included above	-	6
Other armoured cruisers	-	4

The above in no case gives the requisite margin laid down by the Admiralty as a minimum.

Q.—BATTLE-SHIP STRENGTH ACCORDING TO THE "ROYAL NAVY LIST," OCTOBER, 1906..

	Great Britain.	United States and France.	United States and Germany.	France and Germany.
A	25	30	27	30
B	15	12	10	10
C	12	9	5	8
D	5	3	2	5

A=building, ordered or launched since 1st October, 1899.

B=launched between 1st October, 1895, and 30th Sept. 1899.

C=" " " 1891, " " 1895.

D=" " " 1887, " " 1891.

R.—NAVY LEAGUE'S COMPARISONS.

Under a Common System of Points and Classing Effective Ships.

Summary of force in battle-ships and armoured cruisers, including ships to be laid down in 1907:—

Probable actual strength, allowing for efficiency.	Place by No. of		Battle-ships.		Armoured Cruisers.		Total.		Not more than 10 years launched.	
	Units.	Points.	Units.	Points.	Units.	Points.	Units.	Points.	De- stroyers.	Large Torpedo-boats.
England ...	1	1	66	588	38	279	104	867	92	37
France ...	2	2	43	353	24	136	67	489	62	104
Germany ...	3	4	41	332	10	86	51	418	73	7
U.S.A. ...	4	3	30	345	15	107	45	452	20	12
Japan ...	6	5	17	153	13	110	30	263	51	85
Italy ...	5	6	22	141	10	71	32	212	27	28
Russia ...	7	7	17	149	6	43	23	192	96	18

Summary of force in effective battle-ships, armoured cruisers, and modern destroyers, including ships to be laid down in calendar year, 1907:—

	Place by No. of		Effective Battle-ships.		Armoured Cruisers.		Total.		Not more than 10 years launched.	
	Units.	Points.	Units.	Points.	Units.	Points.	Units.	Points.	De- stroyers.	Large Torpedo-boats.
England ...	1	1	44	475	38	272	82	747	92	37
U.S.A. ...	3	2	25	302	15	107	40	409	20	12
France ...	2	3	23	274	24	127	47	401	62	104
Germany ...	4	4	24	237	10	86	34	343	73	7
Japan ...	5	5	12	133	13	110	25	244	51	55
Italy ...	6	6	9	101	10	70	19	171	27	28
Russia ...	7	7	8	112	6	43	14	156	96	18

S.—THE RETURN OF FLEETS (GREAT BRITAIN AND FOREIGN COUNTRIES).

"I am desirous that the Return should give an accurate, complete, and faithful picture of the strength of the Navy."—Mr. Edmund Robertson, 8th November, 1906.

This Return is the only official information granted to Parliament.

It claims in the explanatory notes to include only vessels in "the official effective fighting strength of each Navy." Of the numerical statement of vessels arranged in classes, the explanatory notes say that it "shows in a convenient form the comparative strengths of the various Powers."

The *bonâ-fides* of the Admiralty in this matter can be tested by the following criticisms:—

1. The 86 protected cruisers given in the list include "Apollo," "Intrepid," "Spartan," "Retribution," "Rainbow," "Tribune," "Naiad," "Melampus," "Andromache," "Pique," "Pomone," "Pactolus," "Philomel," "Medea," and "Medusa." None of these vessels, except the "Philomel," have had any money spent on them for maintenance since October, 1904. Their names were long ago

removed from the list of effective ships given on page 270e of the "Navy List," and they all appear on page 405 of the "Navy List," of vessels available for subsidiary services, hulks, and vessels for sale. The "Philomel" had over £23,000 spent on her in 1903-4. She was under the Redistribution Scheme of October, 1904, put on one side without maintenance. In 1906 it was decided to refit her for some subsidiary purpose, but it was found at Haulbowline that such was the deterioration of two years that an extensive refit was again necessary.

2. As regards battle-ships, there are twelve included in the return on which no money has been spent for maintenance. The names of these battle-ships are: "Sans Pareil," "Anson," "Camperdown," "Benbow," "Howe," and "Rodney," included as first-class battle-ships; "Colossus," "Edinburgh," "Thunderer," and "Devastation," included as second-class battle-ships; and "Hero" and "Conqueror" as third-class battle-ships. It is officially stated that less than £1,500 has been spent on the six so-called first-class battle-ships during the last 18 months, and that this sum was not spent with a view of maintaining them, but with the view of preventing any extensive deterioration in their sale value.

3. On 13th June, the Financial Secretary to the Admiralty explained that these battle-ships "are on the verge of becoming obsolete, and it is, therefore, a matter of choice whether or not they should be included in a list which is meant for general information, and does not profess to contain any detailed classification. It has been considered, on the whole, preferable that they should be included for the present until they are finally removed from the list of the Navy." The quotations I have given from the explanatory notes of the Return show this statement to be inaccurate. I think I have also shown how misleading was Lord Tweedmouth's assertion in the House of Lords, 30th July, that "Every man from that Return can judge for himself what the relative strengths of the British fleet and other fleets now are."

T.—GERMAN INCREASE.

The programmes of the German Navy, sanctioned under the Navy Bill of 1906, are given in the following table:—

Year.	Battle-ship.	Armoured Cruisers.	Small Cruisers.	Torpedo-boat Divisions.	Sum to be Spent.
1906	2	1	2	2	£12,336,000
1907	2	1	2	2	13,496,000
1908	2	1	2	2	14,000,000
1909	2	1	2	2	15,030,000
1910	2	1	2	2	15,423,000
1911	1	2	2	2	15,667,000
1912	1	2	2	2	15,931,000
1913	1	1	2	2	16,024,000
1914	1	1	2	2	15,800,000
1915	1	1	2	2	15,838,000
1916	1	1	2	2	15,987,000
1917	2	—	2	2	16,132,000
Totals ...	18	13	24	24	

As showing the increase over the Navy Bill of 1900, it may be stated that the sum to be spent for 1906 under the Bill of 1900 was £9,877,500, whereas £12,336,000 is to be spent.

The following table, from the report of the Treasury Committee of 1859, on the state of the Navy, shows how we maintained our position against our chief rival in the past. A programme of three ships a year cannot possibly keep up such a standard against Germany in the future:—

Year.	Ships of the Line.		Frigates.	
	British.	French.	British.	French.
1778	126	68	126	51
1791	145	77	176	72
1804	175	50	214	32
1812	215	113	272	72
1815	218	69	309	38
1820	146	58	164	39
1825	120	58	156	42
1830	106	53	144	67
1840	89	41	108	56
1845	88	46	104	50
1850	86	45	101	56

U.—PRINCE BUELOW'S STANDARD.

In view of Prince Buelow's declaration that the Powers require navies in proportion to their maritime interests, and that "the German Navy is still very small in proportion to her oversea commerce—judging their relative dimensions by those of other nations," the following figures are included:—

	Miles of Coast Line.
British Empire	42,989
Germany	4,242
United States	17,854
France	8,901
France, Germany, and the United States	30,997

	British Empire	Germany.	Standard proportion British to German.
	Tons.	Tons.	
Steam tonnage in gross tons (1005-6, Lloyd's Register)...	15,410,000	3,094,000	5 to 1
Annual Clearances in Foreign trade in tons (1901) ...	79,250,000	16,349,000	5 to 1
Value of direct trade by sea in 1901	£1,462,000,000	£260,000,000	5½ to 1

In addition it should be stated that while German Colonies are unimportant, so that the Empire may be said to be concentrated in Europe, and united by land roads, only 1·1 per cent. of the British

Empire is in Europe, and it is united to the remainder by sea roads, viz., 34·4 per cent. in America; 25·8 per cent. in Australasia; 21·5 per cent. in Africa; and 17·2 per cent. in Asia.

V.—CRUISERS.

Extracted from the debate, the House of Lords, 21st March, 1905:—

Lord Spencer.—"I have always maintained that we must have a much larger number of cruisers than any two other Powers."

Lord Selborne.—"The duties of cruisers are two-fold. They have to act as the eyes and ears of the battle-fleet, and also to protect our trade. Now, I can only say that in that respect I am more anxious on the subject of cruisers than I am on the subject of battle-ships. . . . I do not think we have any too many fast armoured cruisers, and I should be very sorry if any succeeding Board of Admiralty in any way slackened off in their supply to the Navy of those ships."

The only comment to be made on these speeches is, that we have given up building cruisers altogether, and it is even claimed that the three "Invincibles" of last year's programme, voted as cruisers, are in reality battle-ships.

The memorandum on Admiralty Policy, 30th November, 1905, page 24, stated that, in the opinion of the Board, the best of the unarmoured cruisers which had been retained for the present must be allowed to die out within a few years; or, in other words, 86 cruisers in the Return of Fleets, or 71 mentioned in the Navy List, must vanish in a few years, leaving 35 armoured cruisers and 3 "Invincibles" to do their duties. There are in addition 8 "Scouts" of limited coal endurance.

An earlier opinion of the Board was given in the Admiralty memorandum, 6th December, 1904, on the redistribution of the Fleets. Where dealing with the armoured cruisers it is written:—

"With such ships even the best so-called 'protected' cruisers would engage at a considerable disadvantage, and the slower or smaller 'protected' cruisers would be hopelessly outmatched; their only hope of safety would be in flight, and they could not flee because they have not the necessary speed."

This criticism, while covering the case of nearly all our protected cruisers, is scarcely a satisfactory explanation as to how the Admiralty propose to provide all our fleets with scouts and look-outs from 35 armoured cruisers and 3 "Invincibles," and yet arrange for chasing down 24-knot protected cruisers, such as Germany is building at the rate of two a year. (*See Appendix T.*)

Obviously these vessels are intended, if conditions are favourable, to attack our commerce. The natural answer is to build more cruisers; but this is precisely what we are not doing. We had the "Invincibles" under last year's programme, but to use "Invincibles" to search for little commerce destroyers is an enormous waste of force. This year no cruisers are to be laid down, next year a mother ship for destroyers, but still no cruisers, and the year after, in the endeavour to keep the Navy Estimates from rising, as the "savings" have

already been pledged, the Admiralty will be torn between the conflicting needs of battle-ships, cruisers, and destroyers.

I doubt if the Chambers of Commerce realise that the plain meaning of the Admiralty statement is, that by the time we can build a cruiser, starting from next year's programme, we shall have only 35 cruisers and 3 "Invincibles." Tone the Admiralty's statement down as we may, its gravity can hardly be exaggerated when compared with the opinions of high authorities as to our requirements, *e.g.*:—

a. The Prize Essayist in 1903 said that *apart from the defence of commerce*, we required 74 cruisers for scouting and look-out duties with the fleets in a war with two Powers.

b. Admiral Sir Cyprian Bridge told the Food Supply Commission that *apart from our scouts and look-outs*, we required a numerical advantage of 50 per cent. as compared with the hostile cruisers attacking commerce.

Clearly if one cruiser escapes we must send at least two after her, or a margin of 100 per cent. If two cruisers escape, three will be required, or a margin of 50 per cent., and so forth. So foreigners will decline to play our game, and will act in small detachments.

This is the true inwardness of Germany building 24-knot cruisers at the rate of two a year. At the same time she reaps the full advantage of the turbines, which add about two knots to the speed.

It cannot be pretended that even for peace duties we can manage without a large supply. The refit of the "Philomel" is a case in point. This vessel had £23,000 spent on her in 1904. She was set aside as valueless the same year. Having deteriorated for two years, she is again towed round to Haulbowline to be refitted at great cost for peace service. Consequently the policy of 1904, of employing only ships fit for fighting, is breaking down for lack of fighting ships.

In consequence of the Russo-Japanese war, where both nations neglected all considerations of commerce defence, a practice has arisen of reckoning armoured cruisers as available for the line of battle. Foreign navies, prepared to sacrifice their commerce, no doubt will be able to use their cruisers to assist the line of battle, if in any way fit for the purpose, or in the alternative, divert them to the attack of lines of communication, even as the Boers forced on us inordinate preparations by sometimes appearing as guerillas and sometimes as an army.

W.—DESTROYERS.

The life of a destroyer is a very short one, and it is in view of this fact that the following table furnished by the Admiralty is alarming. It should be clearly understood that Germany will for some years to come lay down 12 additional destroyers per annum. The Admiralty state that the number of destroyers laid down since 1899, inclusive of those laid down under this year's programme, is as follows:—

Great Britain	...	...	...	...	...	44
France	...	...	...	...	...	53
Germany	...	...	...	...	...	48

The Germans reckon only ten years as the life of a destroyer. In our published official lists of destroyers we include among our own all the old vessels, 58 of them over ten years old, while a large number will reach that limit shortly. We maintain 36 destroyers in full commission, and 24 of these are at Portsmouth and Plymouth. On the other hand, the Germans have 33 in full commission at Wilhelms-haven.

As with our ships, so with our destroyers; they will have to keep the sea, and must spend one day in harbour, coaling, etc., for every two at sea. It follows that to secure equality on the field of operations against an enemy waiting for his opportunities, we must have a superiority of one-third.

In addition, Great Britain has laid down 24 of the large torpedo-boats known as "coastal destroyers." Clearly, to class them with modern destroyers, costing 3 to 7 times as much, is inadmissible. Even former types of destroyers of less nominal speed, such as the "River" class, cost twice as much as the new coastals.

The mission of the destroyers at Port Arthur was to get in the first blow. It is stated that we are to have in the Mediterranean only 18 destroyers. The question must be asked: What can 18 destroyers hope to achieve in regard to the half-dozen French torpedo bases? Taking all sorts of first-class torpedo-boats as above, France and Germany have 516 torpedo craft and 91 submarines to our 248 torpedo craft and 40 submarines. These are threats to the battle-ships necessitating, as I have pointed out in my paper, a margin of safety against possible successes.

X.—BRITISH EXPENDITURE ON NEW SHIPS FOR 20 YEARS.

For 20 years past our average expenditure on new construction has been £6,509,000 per annum, but at the beginning of this period the cruisers we built were of the "Mersey" type, or one-eleventh of the cost of the "Invincible," while the battle-ships of to-day are $2\frac{1}{2}$ times as expensive as the "Admiral" class of that day. So the average for the ten years ending 1906 has risen to £8,370,000. At the beginning of this ten-year period battle-ships cost half what they do now. In addition, in 1886 we only considered France; by 1896 Russia had appeared on the scene; and by 1906 we have Germany, the United States, and Japan as well. The official estimate of the value of the Navy, allowing for depreciation, is £127,000,000. Thus an annual expenditure of $5\frac{1}{2}$ millions sterling would do for replacement, but for the rise in the cost of vessels. For the 15 years ending 1884, new construction formed about one-seventh of our total Navy vote. With compound armour the amount jumped up to about one-fifth. In 1888-9 the ordnance vote was transferred to the Navy. Allowing for this transfer, new construction now forms from one-fourth to one-third of the remainder.

Y.—RELATIVE SHIPBUILDING EXPENDITURE.

A frequent error made in comparing the new construction expenditure of the Powers is that no regard is paid to the concealed expenditure under other votes. Thus, gun mountings, which are so heavy an item of expenditure in ships, appear under new construction in Great Britain, but not so in France and Germany. The copy

of Lord Brassey's pamphlet sent to me gives the new construction vote of France and Germany as £6,731,610 (p. 8). The figure for Great Britain, including gun mountings, in 1906 is £9,252,000; but the only one mentioned in the copy of the pamphlet is the swollen figure of 1904 (£11,600,000), when we purchased the "Swiftsure" and "Triumph." The fallacy underlying these figures is one I have frequently drawn attention to. To get at the correct figures one must include the whole preparation of ships for war, viz., shipbuilding, repairs, and armaments.

Mr. W. H. Cowan, M.P., of the Liberal Navy Committee, on 14th November, obtained the exact corrective required by a question in the House of Commons.

Aggregate Sums Voted or Expended for Shipbuilding, Repairs, and Armaments.

Great Britain.

	1901-2. Actual Expenditure.	1906-7.. Estimate.
	£	£
Shipbuilding	8,865,080	9,252,131
Repairs and maintenance of <i>matériel</i> (i.e., hulls, machinery and equipment, anchors, cables, &c.); but not stores ...	1,771,420	1,628,100
Armament, and first outfit of ammuni- tion for new ships and re-armed ships.	1,516,600	1,621,500
Repairs and maintenance of guns and torpedoes	133,900	67,400
Total	12,317,000	12,572,131

France and Germany.

	1901. (Expended.)	1906. (Voted.)
	£	£
France (financial year, January to December)	6,096,146	6,293,320
Germany (financial year, April to March)	5,982,011	6,761,063
Total aggregate	12,078,457	13,057,383

From the above it is clearly seen that whereas formerly our expenditure exceeded that of France and Germany, it is now inferior. Yet ten days after this positive proof is obtained by the Liberal Navy Committee, *The Speaker*, in its issue of 24th November, prints the following grossly misleading statement:—"In the shipbuilding votes for the current year the British Parliament has made provision far exceeding the two-Power standard." I venture to forecast from a careful study of existing programmes that our expenditure in connection with the preparation of the war *matériel* of the fleets will be 3½ millions sterling less than the combined expenditure of France and Germany next year.

Z.—RELATIVE BRITISH AND FOREIGN EXPENDITURE.

Sir Edward Grey at the Eighty Club on 31st May, 1905:—

"The present Army and Navy Estimates apparently have no relation whatever to the policy of Imperial defence which he (Mr. Balfour) has laid down. The policy points to the reduction of the Army Estimates and considerable expenditure on the Navy; and we understood that the present Government intended to reduce the Army Estimates, but that it would certainly spare nothing to maintain a strong Navy. Well, it has done just the opposite; it has increased the Army Estimates and reduced the Navy Estimates. Now, I agree that in much of the changes in the Government there appears to be what makes both for economy and efficiency; but I confess I am a little alarmed by statements which I have seen with regard to our reserve of naval guns. I wish before the Government began applying their doctrines of economy to the Navy they had applied those doctrines to the Army, where I believe there is a much larger and much safer field for economy."

I have seen several comparisons of expenditure lately which convey erroneous conclusions. The writers forget—as reference books omit to mention as well—that the German Estimates do not include pensions, that the French Estimates underwent a fictitious decrease in 1902 and subsequent years, involving about a million sterling, through the transfer of the Marines to the War Department. The Admiralty figures, allowing for pensions, show that the relative increase for the last two years of the German Estimates in comparison with our own is £7,086,000. What will be the position next year? Both our own and the German Estimates are pledged in advance, the Germans to increase £1,160,000, and ours to decrease by what I estimate to be £1,800,000. This gives a relative German increase for the three years ending 31st March, 1908, of £10,000,000 sterling. If our Estimates after that remain stationary, the German Estimates sanctioned for 1909 provide for a further increase of £1,534,000. We have thus the huge relative increase of 11½ millions sterling.

The only point that can possibly be in dispute is my estimate as to our own decrease next year. It is founded on Mr. Robertson's speech on 27th July. Mr. Robertson then said:—

"I do not think that the full financial effect of our proposals will be felt till next year. The financial effect on next year's Estimates (1907-8) will be that there will be a lightening of those Estimates to the following extent:—

"Vote 8, by the sum of £1,305,308.

"Vote 9, by the sum of £1,488,680.

"Total, £2,793,988."

These reductions, he explained, were on what would have been the case if the full 1906-7 programme had been persisted in. A mother ship for destroyers (Lord Tweedmouth said a "scout") was to be laid down in June, but "the amount to be taken for new vessels in 1907-8 was to be limited to a small sum" in order "to emphasise to the Hague Conference the good faith of the British Government in its desire to bring about a reduction of armaments." Since the example was set on 27th July, the German, Japanese, and American

programmes have been increased by fresh demands, the South American Republics have begun to order war-ships again, and the naval budget of every important Power, except our own, has gone up.

As less than half-a-million is being taken for the new construction of this year, the emphasis on a small sum can only mean that about a quarter of a million at the outside is to be taken.

Mr. Robertson also said: "I do not want the Committee to come to the conclusion that what I have said exhausts the list of possible economies." This obviously refers to the saving through ceasing to effect repairs on 16 armoured ships which have hitherto been maintained with nucleus crews, and the placing of 11 armoured ships out of full commission. I have, therefore, given a conservative estimate, allowing a large margin for contingencies, when I put the decrease at £1,800,000. Such contingencies include the automatic rise of expenditure, once referred to by Mr. Robertson as £665,000, the new dock at Portsmouth, and possible expenditure on Rosyth.

I have compared our naval expenditure with the German, but that is not the whole story as in the view of the Cabinet part of the naval expenditure in this country is to balance the huge military strength of gunnery. Thus Mr. Haldane said at Brighton this month:—"The expenditure on our Navy might be set against the expenditure of those foreign Powers who laid out their resources in taking two years of the best periods of the lives of their young men for compulsory service. The Statesmen of this country, who advocated compulsion, would be calling on the nation to pay twice over for the same thing."

OPINIONS AS TO THE MEANING OF THE TWO-POWER STANDARD.

"Beyond comparison with any two Powers."—*Report of the Three Admirals, 1888.*

In his speech introducing the Naval Defence Act, 1889, Lord George Hamilton said:—

"The paramount idea underlying the utterances of those who in previous years have held my position and that of Prime Minister . . . has been that our establishment should be on such a scale that it should at least be equal to the naval strength of any two other countries. (Hear, hear.) . . . No amount of foresight or calculation can anticipate naval combinations and naval movements. For the purpose of meeting such unexpected blows we should have a considerable margin of reserve."

Sir Edward Grey in the House of Commons, 1st March, 1904, said:—

"In 1885 the standard set and maintained by Mr. Gladstone's Government was to lay down two ships for every one ship laid down by the French Government. Under the Naval Defence Act, the standard changed, and there came the two-Power standard. That standard must not be taken to apply to any two Powers in particular, but to the two Powers which at the time of speaking had the largest Navies."

Lord Selborne in the House of Lords, 21st March, 1905, said:—

“The two-Power standard never had applied to any two particular nations, but always to the two strongest naval Powers. . . . If you compare the margin of security which Parliament provided under the Naval Defence Act of 1889 with the margin of security we at present enjoy, the margin was greater then than now.”

Lord Cawdor on 3rd November, 1906, said:—

“The test the Admiralty applied to naval efficiency and the standard they had set up for years past as that which must be maintained was that we must be strong enough in battle-ships alone to defeat any combination of any two Powers, and that we should have a margin over and above this for contingencies of some ten per cent. This was the minimum which they had considered safe. With respect to our cruiser power, we needed and must maintain far more.”

Extract from the Parliamentary debates, 31st July:—

Mr. Bellairs asked the Prime Minister whether he had communicated to the Admiralty his view that the standard of France and Germany was a preposterous one?

Sir H. Campbell-Bannerman:—“I think they are quite aware of my views.”

THE HOUSE OF COMMONS,

13th November, 1906.

Viscount Turnour:—To ask whether it was the settled policy of the Admiralty in framing their shipbuilding programme to meet only those programmes of foreign Powers which were actually sanctioned by their respective Parliaments.

Mr. Robertson:—The answer is in the affirmative. The Admiralty were also guided by the number of vessels actually laid down, and the progress made in their construction.

(On 27th July, it should be noted, Mr. Robertson made the announcement that the programme for the following year, 1907-8, would be cut down to two armoured ships to be laid down at the end of the financial year or March, 1908. If the Hague Conference failed to realise the Government's hope, three armoured ships would be laid down.)

THE HOUSE OF LORDS,

30th July, 1906.

Lord Tweedmouth:—It was wise and right to reduce the programme as it stood when the noble Earl left office. It was proposed, as the noble Earl said, to build four armoured ships. The outlook then was that France was going to lay down several very large battle-ships; the United States were going to lay down two new great battle-ships, besides two that had before been carried; Russia was going to lay down one first-class battle-ship and two armoured cruisers; and Germany was going to lay down two very large battleships and one armoured cruiser. *It was in view of this knowledge that the programme was originally framed.*

The late Civil Lord of the Admiralty has denied that these programmes were taken into consideration when our own was framed in November, 1905. The French and German programmes were only sanctioned in the spring of this year.

It is worth while to note in connection with the above statements how the naval policy of Great Britain fluctuates. In 1889, under the Unionists, we had the Naval Defence Act, in which the money was provided at once for a programme over a period of five years. In 1891, under the Liberals, we had a programme for five years, the money being provided year by year. "The new scheme of construction," said Lord Spencer in his statement explanatory of the Navy Estimates in 1904, "forms part of a complete programme which has been arranged for a term of five years." The Secretary to the Admiralty explained that "the cost of the programme behind is very much larger," and "will involve for the five years ensuing a very liberal provision by Parliament of public money to meet the needs of the Navy." At Sheffield, 19th October, Lord Tweedmouth, forgetting that Mr. Robertson had given away next year's programme in advance, said: "The Admiralty believed that the best course was year by year to form the programme of the year for the necessities of the year estimated according to the exact amount of work which had been carried out by our foreign rivals."

American Policy:—

"I would rather see the country abandon the Monroe Doctrine and give up all thought of building the Panama Canal than to see it attempt to maintain the one and construct the other while refusing to provide the means which can alone render its attitude as a nation worthy of the respect of nations and of mankind. There is one thing we must not do, and that is to bluff. Therefore, gentlemen, keep on building up and maintaining at the highest point of efficiency the United States Navy or quit trying to be a big nation."—*President Roosevelt, 22nd June, 1905.*

German Policy:—

"Germany must have a fleet of such strength that a war, even against the mightiest naval Power, would involve risks threatening the supremacy of that Power."—*Preamble of the German Navy Bill of 1900.*

Admiral The Hon. Sir EDMUND R. FREMANTLE, G.C.B., C.M.G. (Rear-Admiral of the United Kingdom):—I have not had the opportunity of reading the paper or the valuable appendices to which the lecturer has referred, but at all events we have in our hands one valuable appendix, namely, the diagram showing the want of continuity in the British shipbuilding policy. I am very glad the lecturer mentioned something about the Blue-Water School, because it is universally misunderstood. The late Admiral Colomb was the first to state what our policy ought to be, and the idea, generally speaking, is that we do not want so many defences round the coast, but that we want a mobile Army. He always laid stress on the necessity of that, and those who read it in a different way and talk about "no necessity for defence school," or something of that sort, wilfully misunderstand it, and wish to give it a bad name. The idea of the Blue-Water School is, that we want a very good Army, but we do not want to overdo the defences, whether on the coast or in the interior. I feel inclined to mention some particular defences with which I am acquainted, which, I think, are distinctly in point. When I was in command at Plymouth I went on more than one occasion with Lord Wolsley,

who was then Commander-in-Chief, and Sir Redvers Buller, then Adjutant-General, to look at all the defences, including the high-angle firing batteries, which at that time were much in favour. The object of the high-angle firing batteries was to prevent a fleet lying in Whitsand or Cawsand Bays and shelling the dockyard and ships in the harbour over the Maker Heights. I do not want to digress on that point, only it occurs to me, as it must occur to everybody who has studied the question of the position of these islands, that no enemy would ever dream of doing that unless we were fighting an enemy which was in the position this country was in during the Crimean war, that is, having a very big Navy and a very small Army. Lieutenant Bellairs has mentioned the expense of new constructions in this and other countries, and I do not presume to follow him entirely there because I have not the figures before me. I did, however, take the trouble to controvert some figures which were given by Lord Brassey to the Chambers of Commerce Defence Committee. The figures of Lord Brassey were, of course, perfectly and strictly accurate, but were entirely misleading, because he gave the figures for this year, and at the same time gave the figures for France and Germany for this year; but he knew perfectly well that we were reducing those figures for this year, and intending to reduce them very largely next year, and the figures of France and Germany—certainly those of Germany—are bound to increase, according to the new Act of 1906. Therefore, those figures were quite unreliable. I saw a statement in the paper to-day, I think, that the United States proposes to increase its Navy Estimates by rather over three millions in the course of next year, and probably a very large proportion of that amount will go in shipbuilding. While on that question, I should like to refer to a pamphlet which has gone the rounds, which looks very much as if it emanated from the Admiralty. I do not know whether it did or not, but at any rate, it expresses what looks very much like the Admiralty view. I dare say some of you have seen it. It is a shilling pamphlet, which is very well got up, and is called "The Truth about the Navy." Lieutenant Bellairs referred to the decrease which has been made in the vote for the shipbuilding for the present year and the decrease in the shipbuilding programme. The greater part of the economy due to this will show its influence next year and the year afterwards. That state of things has been acquiesced in by a great many of the papers, and some endeavour has been made to justify it by naval experts, who somehow or other seem to think that anything which is done by the Admiralty is satisfactory, and that we are not to use our own judgment on the subject at all. But "Excubitor" has a chapter in his pamphlet in which he gives a very good account of the new German Act of 1906; and in referring to 1905, when our programme of four ships a year was laid down by the old Board of Admiralty, he speaks of the German ships as comparatively useless, and, in comparison with British ships of contemporary date, as being strikingly deficient in gun power. That is the position which our Board of Admiralty had to meet so far as Germany is concerned when Lord Cawdor's statement was made in November, 1905. They may have had some idea of what was likely to take place in 1906, because coming events cast their shadows before; but, at the same time, they could scarcely have had prescience enough to know exactly what the German Act of 1906 was going to be, and I do not think they knew at all what it was going to be. What does "Excubitor" say about the German Naval Act of 1906? He says: "The significance of the new naval proposals which have been adopted by the German Reichstag have not yet been realised in England. They are intended to render the German

Navy, until recently a negligible quantity in Europe, a force second only in strength to the British fleet itself. The 1906 amendment of the German Naval Act of 1904 is equivalent to a further addition to the German Navy of eighteen battle-ships, besides six armoured cruisers of maximum size, power and speed, and a number of torpedo craft over and above the provision made in the seventeen years' programme of 1900." If that statement is correct, if there is any truth in it at all, the decision to reduce our shipbuilding policy in July this year is absolutely untenable on strategic grounds. Of course, on economical grounds, if we are to go on the principle that we only vote supplies for the present year, and that the future must take care of itself, and if we do not care as long as we make a little economy this year what extravagance takes place in future years, under those circumstances perhaps they may be justifiable, but not on any common-sense principle. I lay great stress on what the lecturer evidently wishes to bring home to us more than anything else, namely, the want of continuity in the British shipbuilding policy. It does seem to me that a programme is as absolutely necessary as a routine on board a ship. We have a routine on board ship, although we depart from it sometimes; but a ship without a routine is a ship without a system—is a ship which is not conducted on any scientific principles at all; and it appears to me that that is very much the principle on which our shipbuilding policy is conducted. You must also remember that the extravagance of such a policy is very great. We all know what the excuse for the reduction is. What is it? Because neither France nor Germany has laid down a ship in the present year. And why have not they laid a ship down? Because they propose to make very much greater strides in the future; because they intend to expend so much more, because they intend to rival us, and under those circumstances they are obliged to hold their hands for a moment, because they are not ready to build those large ships which we have set them the example of building. If our coat is to be cut so exactly to the cloth of other nations (I do not approve of that policy at all); but if that is so, the loss of the "Montagu" the other day ought to have been immediately made good. In my opinion that ought not to be our principle. We ought to have some continuity of policy; we ought to have something like a programme, and some margin. This question is an old hobby of mine. I recollect that I spoke to Lord Selborne about it once or twice, and he said in reply: "The fact is, we have a programme at the Admiralty, but we are not going to tell everybody what it is." If they have a programme at the Admiralty, it is an extremely elastic one, as the lecturer has shown. You can see that, not only in regard to the battle-ships, but in regard to the torpedo flotilla. There is only one more thing to which I would like to allude, because I have detained you quite long enough already, and that is the question of the tonnage argument, which I think the lecturer has fairly disposed of. It is, of course, perfectly ridiculous to use that argument when we take into consideration such vessels as those of the "Diadem" class, vessels of the "Terrible" class, and those very large vessels which pile up the tonnage, no doubt, but are really only monuments of the mistakes we have made. I do not know what our friends the Japanese think about it, but they do not build ships with unarmoured ends. Captain Klado, in speaking of the loss of the Russian ships, attributed a great deal of it to the fact that they had unarmoured ends. Under those circumstances, as we have a great number of ships with unarmoured ends which have been objected to by naval officers, I think the sooner they are replaced the better. There is only

one more point to which I will refer, and that is the pious opinion expressed by the lecturer, that we shall always have a redundancy of men. I should very much like to know whether the Japanese found that that was the case. Lieutenant Bellairs says, truly enough, that unless the ship goes down very few stokers are lost; but a great many of the Russian and Japanese ships did go down. We know that the Japanese themselves lost two battle-ships besides several other vessels. But not only that, I should like to know how the wear and tear affected the health of the men. You cannot keep men at sea constantly engaged in warfare, and deprive them of the comforts which they obtain when they are not at sea, and keep them in the best of health. I am quite certain that as regards the officers, the losses will be very heavy from the amount of responsibility they will have to bear. I cannot help thinking, also, that it will be the same with the petty officers, if not with the men. I do not wish to detain you any longer; I only wish to say how very glad I am that the lecturer has brought this subject before us. On the question of ship construction and the ships we ought to have under construction, there is no one who has given more attention to the subject, and no one more capable of giving an intelligent opinion upon it than Lieutenant Carlyon Bellairs.

Admiral Sir NATHANIEL BOWDEN-SMITH, K.C.B. :—I find it difficult to offer any worthy remarks on the hon. gentleman's lecture, because the paper was only put into my hands as I entered the theatre, and I have not even looked at the appendices. In the paper which Lieutenant Carlyon Bellairs kindly read to the members of this Institution in June, 1904, he expressed a hope that the cost of a battle-ship might rise to £2,000,000, as in that case he ventured to think some of the foreign Powers would not be able to continue in the competition. As regards the actual cost of a first-class battle-ship, it appears as if his wish would soon be gratified, but this great cost does not seem to stop their construction. The Japanese have recently launched one of 18,000 tons, and the German Reichstag, by their Naval Amendment Act of 1906, have authorised the construction of 18 such ships between the present time and 1917. But although I do not feel competent to criticise the paper, I should like to offer a few observations on the standard of naval strength, because certain newspapers and writers seem to be endeavouring to get up a naval scare. Now, whilst giving these gentlemen every credit for sincerity and patriotism, I do not find myself in agreement with them. After studying tables relating to these matters, I maintain that with regard to European nations our two-Power standard is well maintained, and more than maintained. That being the case, I submit that it is a mistake to build ships in advance of our requirements, because such rapid improvements take place that what may be quite up-to-date to-day may be slightly behind the times in the following year; and Sir William White, in one of his recent interesting letters to the *Times*, has pointed out that we can build ships, and carry out all the details of equipment, much more rapidly than other nations. Besides, we have reason to know that although the construction of certain foreign vessels is authorised, there does not seem at present to be any great haste in laying them down. Sir Edmund Fremantle has alluded to a pamphlet, quite recently printed and distributed anonymously, on the question of the comparative strength of Navies, but I beg leave to state that I formed my opinion on this subject before I saw "The Truth about the Navy." That pamphlet, however, has confirmed my convictions, and appears to have been written by someone well up in the

subject. As allusions have been made in some quarters to the present strength of the German fleet and the possibility of a sudden attack on us from the fact that nearly the whole of their naval power is concentrated in the North Sea, let us just consider the position. We will allow that the Germans have two squadrons, each of 8 battle-ships, ready for service. There would be 8 vessels of the "Deutschland" and "Braunschweig" class, of 13,200 tons, with 4 11-inch guns each and smaller armament, and 8 vessels of the "Wettin" and "Kaiser Barbarossa" class, of 11,000 to 12,000 tons, and their 4 9·4-inch guns each and smaller guns. Our present Channel Fleet is, I understand, to consist of 14 battle-ships, the two first of 16,500 tons, eight others of over 16,000 tons, and two more of 15,000 tons, the whole much more heavily armed than the German ships. Lieutenant Carlyon Bellairs objects to this comparison by tonnage, but it is impossible in a few minutes to go into all details of armour and armament. Behind the Channel Fleet we have the Atlantic Fleet of 6 modern, well-gunned battle-ships, and as an immediate reserve we have the Home Fleet, manned with nucleus crews, and the "Dreadnought," with a complete crew, as flag-ship. Our preponderance of cruisers is very considerable also at present, but if the German nation carry out their intention of constructing 18 battle-ships of "Dreadnought" dimensions (and I have not much faith in the coming Peace Conference), then we must go ahead with our building and keep well in advance. The hon. lecturer contemplates a danger ahead in reducing our naval construction in any one year, because some Members of Parliament, and especially the Socialist Members, will look upon any reduction as permanent, and will in future object to any necessary expenditure; but I cannot think that a Government like the present, backed up by the largest majority we have ever known, will be deterred from doing their duty to the country by a small body of Members who call themselves Socialists. As for the Labour Members generally, I believe they are far too patriotic and level-headed to allow the risk of their country getting under the heel of any foreign Power. In the construction of new vessels in peace time I should not encourage overtime in order to obtain rapid completion. Doubtless there are men who are glad to earn higher daily wages, but the usual hours are sufficient for their health and well-being; besides which, three men working overtime may prevent a fourth from working at all, which is bad for him, and still worse for his wife and children. In times of emergency men must, of course, be called upon for every effort, when we may, I feel convinced, rely on their co-operation.

Mr. L. COPE CORNFORD:—I feel great diffidence in speaking after the distinguished officer who has just given us his views on what he calls a naval scare. I am delighted to hear the Admiral say there is no necessity for a naval scare, because on the facts which have been adduced by the lecturer, and other facts to which he referred incidentally, I personally was of an entirely different impression. If you will allow me a few moments I will put a few considerations before you. With regard to the question of shipbuilding, the lecturer has said very clearly all that is necessary, so that I need not touch on that point at all. With regard to the *personnel*, Lieutenant Bellairs assumes that we have quite sufficient *personnel* in time of war; but there are other things to be considered, and among them is the condition of the *personnel* at this moment. I would like to point out to this meeting that 30,000 men and more are kept in barracks ashore, instead of being under training at sea, and that the reduction of the sea-going squadrons by six battle-ships and four cruisers

will place another 8,000 or 10,000 men on half training. Although the Admiralty Memorandum of 24th October states that those men will be afloat and not ashore, it means that they will live on ships in harbour—exactly as the Russians did in their ships at Port Arthur, and exactly as the Russians do in the Baltic Fleet in the summer, while they live ashore in the winter. That is not a reassuring proposition. I should also like to point out, as the lecturer has told you, that eight battle-ships of the “Royal Sovereign” class are stated to have been placed in the special reserve with skeleton crews. We have also been told in the House of Commons that five vessels of the “Admiral” class, and the “Sans Pareil” and other obsolete vessels are to be sold. The “Renown” is now a Royal yacht. Four second-class battle-ships (two “Centurions,” two “Trafalgars”) are also to be laid up. I will not trouble you with the figures, but if you work out the total reductions, including the eight “Royal Sovereigns,” you will find that we are left with a total available number of forty-one battle-ships, although the Dilke Return gives a far higher number. We are told that this scheme is not in operation, but if you look at the Naval and Military column of the *Times*, you will see that the ships are being withdrawn one by one. That, to my mind, is cause for alarm; but we are told that there is no cause for alarm because of the formation of the new Home Fleet, on which Admiral Bowden-Smith says there may be some reason for argument. To my mind there is very great reason for argument. The Admiralty declined to tell us what sea training is afforded by the Home Fleet, how much it is, how many men are to be allowed to each ship, how often the ships are going to sea, and even decline to tell us what the ships are that compose it. There is only one conclusion to be derived from the Memorandum, namely, that the ships are kept in harbour, and that the men are kept on a half, or perhaps a quarter, training. Under the present system of nucleus crews, the men only go to sea ten days a quarter. As far as the reserve is concerned, the reserve proper is kept to reinforce the fighting line, and I do not know that there is very much objection to that; but if we reduce the sea-going squadron in order to swell the reserve, with perhaps a slight increase of sea training, consider what that means. The preamble of the German Navy Act lays down as an absolute axiom that the only possible way of keeping ships efficient is to keep them at sea in full sea training. I have not the honour to belong to the Naval Service, but I have never yet had a conversation with a naval officer who has not said that the only way of maintaining a ship in an efficient condition was to keep the men at sea under training. I should also like to mention, with regard to the *personnel*, that the entries for the Royal Naval Reserve have been entirely stopped, as you will see by reference to the last Naval Estimates. I should also like to call attention to the short service system with regard to the *personnel*, by which men, instead of being enlisted for continuous service of twelve and nine years, are being enlisted for twelve years, only five of which is spent in active service, and the remainder in the reserve. I believe that the naval officers present will agree with me that it takes, on the average, five years to make a man efficient. These men, after five years, are passed out on sixpence a day pension! Sixpence a day pension is no use to him; he must get a job. He is an unskilled labourer ashore, whatever he is at sea. Where does he go? He goes to the United States Navy. In addition to the short service system, there has been introduced lately, under, I am sorry to say, a Unionist Government, a system of inviting continuous service men to break their service at any time they like, and to pass into the Royal Fleet Reserve. What does

that mean? It means that those men also go to the United States Navy in large numbers, where they get from three to four dollars a day. We are training first-class seamen and gunners for the American Navy; that is what it comes to. Why? In order to save pensions, and for no other reason whatever. That is stated in the last Naval Estimates—in order to save the granting of pensions to men who have devoted the best years of their lives to the service of this country. We have also heard that the Coastguard is to be abolished. The statement has not been confirmed—nor has it been denied. That will mean that over 4,000 disciplined men—the finest in the Service—will be, in a few years' time, no longer available as a reserve force. I do not see where the saving is effected. The Coastguard duties must be performed by some body of men. The cost will not appear in the Naval Estimates, but it will appear in the Civil Estimates, and therefore it is called an economy! The last point to which I want to call attention is the fact that the Royal Marines have been reduced by 1,529 men—the Royal Marines, a corps second to none. I would like to remind you also that two years ago a proposal was made to abolish the Royal Marines altogether. I cannot tell you the circumstances under which the proposal was negatived. It was, however, negatived by a high authority. With regard to the question of the lack of cruisers, I hope Admiral Fremantle will give us his views on the subject.

Vice-Admiral Sir CHARLES CAMPBELL, K.C.M.G., C.B., D.S.O.:—I only rise in order to add my testimony to that of the other speakers of the extreme pleasure with which I have listened to this extraordinarily well-written paper, which has been put before us in such a wonderfully clear manner. In the course of his lecture, Lieutenant Bellairs referred to historical retrospect. I do not think he quite knows what is done at Greenwich. In the course at Greenwich they are all taught naval history, which I consider is a most important point. You cannot obtain a glimpse of the future except through the medium of the reflected past. That is a very well-known maxim. It is only by studying history, and being well up in everything connected with the Navy, that you are able to lay down lines upon which you can travel in the future with safety and economy. With regard to the two-Power standard, of which so much has been said, so far as I am concerned, I am a three-Power standard man. Of course, we have to remember the public purse, but where it is possible there is not the slightest doubt that that should be our position. I am one of those who do not consider that twelve ships make a fleet, and I have endeavoured in this Institution and elsewhere to prove that. Besides the actual ships that are required for fighting purposes we must also have colliers, ammunition ships, hospital ships, look-out ships, and all the paraphernalia that goes to make up a fleet. If we went to war to-morrow we should have to take up all these things probably haphazard. I think myself money should be spent long beforehand in practising these ships with the fleet, and, generally speaking, making the fleet mobile, as it would be in an actual fight in time of war. There is only one other point I would like to mention, that is, that I am also one of those who do not think we should depend on the English Channel as our only way of getting into the North Sea. I am of opinion that this little island ought to be cut across from Edinburgh to Glasgow, and that we ought to be able to transfer battle-ships from the North Sea to the Atlantic by means of a canal, or keep them inside in a loch if necessary. I am a very strong advocate of spending the nine to ten million sterling required, I believe, to cut the canal from Edinburgh to Glasgow. I believe it is a

point of strategy which would be worth over a hundred millions to this country, and would be a great saving of naval strength to us. I hope before I get out of it I shall see that done. The other point I wish to raise is rather a debatable one, but I am very strongly in favour of the idea that we should have means of transporting troops to the Continent other than by over-sea; that means, of course, the Calais-Dover Tunnel, which I also hope to see made. I think that would be a fairly strong strategic point. If we could transfer troops to a friendly nation on the Continent by means of such a tunnel, if we had a difference of opinion with some other nation, we should not require such an enormous fleet of transports to carry the troops across the sea. You must remember that taking ships across the sea does not only mean the employment of transports, it means the use of an enormous fleet of convoying ships, which have to be taken from their proper work. I wish to say, in conclusion, how very much interested I have been in this lecture, and to add my thanks to the lecturer for the excellent way in which he has brought the subject before us.

Mr. L. GRAHAM H. HORTON-SMITH, F.S.A. Scot. :—Like everyone else, I have listened with the utmost attention and interest to everything that has fallen from the lips of the speakers up to the present moment, and it is with some diffidence that I rise to place before you the views which I hold upon this subject. I should like, now, in the first place, if I may, to take one particular point in Admiral Bowden-Smith's speech—one which at first glance seemed to be a good point—namely, that we need not build as much at the present moment as we should otherwise build, for the reason that the British nation can build more rapidly than any other. Assuming the reason relied on to be sound in fact (a suggestion the accuracy of which I am not to be taken as admitting), that might be something in the nature of a good argument; but, if I may say so, and I say it with the utmost respect for the Admiral, he has cut from his own argument the sole basis whereon it rests, for at the close of his speech he said that he considered it very undesirable (for reasons which he gave) that we should build rapidly. Now, you cannot have it both ways. Either it is a bad thing to build rapidly or it is not; and if (as would appear to be the Admiral's opinion) it is a bad thing to build rapidly, then you must build in advance, and so, by slower building, secure the same effect as if you began later and built more rapidly. And now, coming to the great principle known as the "two-Power standard," we have at the outset of this discussion, as it seems to me (for reasons which I will mention in a moment), the presumable fact, or what I should call a *prima facie* case, that the two-Power standard is being thrown overboard. If we complain, we are asked why—if we are right—does not the Opposition dare to move the adjournment of the House of Commons? Is not this, perhaps, because the late Government is itself not free from blame in regard to its naval administration, and fears the obvious retort which such a motion would invite? I am not one of those who think so highly of what Unionist administrations of the past ten years have done in regard to the Navy. But it is now more material to ask: "What has the present Government said and done, what is it doing, with regard to the Navy?" Before coming into office the present Prime Minister stated: "I accept the doctrine of standard of supremacy that our fleet should equal any two other fleets in the world." What, now, has been the hitherto accepted meaning of the two-Power standard up to the present year?

It means, not a mere equality with the two next strongest Powers, but the capacity to meet and beat the two next strongest Powers; and that no doubt is the standard which Sir Henry meant that he accepted. You cannot be certain to beat your enemy unless you have some margin of superiority. Personally I am not prepared to accept the 10 per cent. margin alluded to by other speakers. I agree with Admiral Campbell's view. Why should the British Empire, which exists on and by sea power alone, run the risk of trusting its security to a 10 per cent. margin; especially nowadays, when there is plenty of chance of battle-ships being sunk from all sorts of extraneous causes, as was seen in the recent Russo-Japanese war? The British Empire can afford no risks whatever, and I seriously question whether a 10 per cent. margin of superiority is to-day sufficient. But assume it is. It is yet to be a superiority as against the next two strongest Powers. That has been and is the accepted meaning of the two-Power standard, and that it is which, as I have said, Sir Henry Campbell-Bannerman accepted before he came into office; but now that he is in office he has closed the book of his past statements, and argues that it is preposterous to suggest that France and Germany, for instance, will ever join together. Is it really such a preposterous thought? If Germany were to choose to square with France on the condition of France taking Belgium without Antwerp, and Germany taking Holland plus Antwerp, there would be all the foundation of a good square deal in the part of France and Germany; and if they saw their chance of such square deal, it may well be that for its purposes the French might sink for the moment their grievance as to the Lost Provinces; and you may be sure that if Germany (by way of utilising further in her own interests such achieved community of purpose) saw any chance of getting for herself some of those fair places of the earth which the blood and treasure of our forebears have bought for us, Germany would take the first available opportunity of turning that chance into a certainty. And yet we have the Prime Minister saying that he will not look at the two-Power standard if it means a standard as against France and Germany; and all the time you have the conditions of a French and German coalition existing. What does the expression "standard" mean? If we are not going to keep to our standard of building so as to be able to meet and beat the next two strongest Powers, whichever they may be, what is the use of calling it a "standard" at all? If a thing is stable it may be called a standard; if it is not it is no longer a standard. If the two-Power standard is no longer to have the meaning it has always hitherto borne, a meaning which can be "understood of the people," a meaning which, clearly understood, enables the country to keep an intelligent eye upon the Admiralty, then not only is it no longer a "standard," but no longer has the country any basis upon which it can intelligently follow and intelligently (if need be) criticise the actions of those who from time to time may be responsible for the Navy. If we are not to discuss the position as against the combination of France and Germany, it would almost appear unreasonable and unnecessary at the present moment to discuss the question at all, except in so far as there may be suggested a possibility of a war between the United States and Germany in union against ourselves, which I confess I do not myself anticipate as very likely, though of course it cannot and must not be left out of consideration. Taking, then, the Premier's own statement, to which I have just referred, you have, as it seems to me, a good *prima facie* case for suspecting that the Government

are, in fact, throwing overboard the "two-Power standard" in its hitherto accepted sense. But there is more than what I have already mentioned. The Premier was asked in the House on the 12th of last November whether the two-Power standard in its hitherto accepted sense was or was not the policy of his Government; and he declined to answer that very simple yet all-important question. Admiral Bowden-Smith has told us that in his opinion we are all right at the present moment; I confess I think we are not far from being all wrong. The point, however, is, not whether we are safe or unsafe at the present moment, but, whether, and upon the adoption of what policy, we shall be safe in the years to come. Coming now to facts as apart from statements: Do not let it be forgotten that when the Cawdor Memorandum was issued last year, it was no ordinary Memorandum; the Unionist Government were putting their heads together to see what was the absolute *minimum* that they could safely suggest, and as the result of their deliberations it was decided that it was essential that we should lay down as a *minimum*, four armoured vessels in 1906-7, and four in 1907-8 (eight in all), each to be built within two years; yet in May of 1906, with a new Government in power, when nothing had in the interval taken place on the Continent of Europe to make any variation necessary, the Admiralty, through the First Lord, come forward and say that the country, instead of needing as a minimum four and four (as they had said but a few months earlier) could do with only three and two; that is to say, instead of eight, only five! And this in face of the fact that both France and Germany have during the interval brought forward increased programmes, and the "Montagu" has been lost. I will only add one word with respect to repairs. Is it not really alarming to be told and (if it be the fact) to realise that 75 per cent.—some say 95 per cent.—of the repairs of the ships of His Majesty's Navy are left undone to such an extent that large numbers are not capable of doing the duty they ought to do? Take a single instance (I have not time for more), the "Glory," which, for the reason indicated, could recently steam but 12 knots instead of her normal 18! I should like, however, ere I sit down, to refer to one other matter: the question of cruisers, to which the two-Power standard has, of course, no application. This question is one which Admiral Fremantle has had under his continuous consideration since 1902, and it is a matter to which we must give yet more and more attention. As late as June of last year he stated in the public Press that for the purpose of commerce protection alone, to ensure our food and raw material from the hands of the enemy, we require at the present moment (beyond what we, in fact, possess) "at least 50 fast protected cruisers of not less than 21 knots speed" to be "built without delay." That is the result the Admiral has arrived at after many years of thought. It has been suggested that the result of the late manœuvres has shown it to be an impossibility for the British Empire to protect its own commerce. If that is so, it at least supplies a reason for Mr. Robertson's statement, that it is not in the public interest to give any information relative to the results of those manœuvres! Ministers of both Parties, when they do not wish to give an answer to a naval question, say either that the question asked is immaterial, or that it is not in the public interest to give an answer! But we are entitled to know—and we *must* know—whether it is intended in fact that we shall protect our commerce in war. If we intend to do so, then it follows, that if Admiral Fremantle is right, we must proceed at once to build for the purpose, as with our present number of cruisers we should,

ex hypothesi, be unable to afford the necessary protection. Remember that if our commerce (which includes our food) is insufficiently protected, then, when the day of war is on us, up will go the cost of freight and insurance to such an extent, to say nothing of "corners," that the cost of raw materials for our manufactures will be enormously enhanced, while food itself will go to famine prices. There will be both shortage, and simultaneously, enhanced prices. There will be great distress. Manufacturers will have to shut down their works; wage-earners in consequence unable to earn any wages at the very moment when food will be rising rapidly in price; and there will be grave danger of our being starved into submission by the outcry of the poor. I do not think I am putting the case too high. In 1812, when we were fighting two Powers (France and America) at the same time, although we were at that date almost entirely self-supporting, and although our population then was less than half what it is to-day, the quartern loaf went up in price to 1s. 8d., and bread riots took place in many of our large towns. Bread riots are next door to submission, for no Government can keep in power and carry on a war if the whole country is in a ferment of discontent, with riots from starvation the rule on every hand. Yes, if the Admiralty means to protect our commerce in the event of war, then it follows that, if Admiral Fremantle is right, the means for that sufficient protection are at present non-existent; while, if he is to be regarded as wrong, it would almost seem to follow that he is wrong only because the Admiralty has decided that we are *not* to be prepared to protect our commerce in the day of war. If that be so, indeed, then *Good-bye to the British Empire!*

Mr. EDWARD BEAUCHAMP, M.P. :—We have listened to a very able and a very instructive paper read by my friend, Lieutenant Bellairs; but as we have only heard it read and have not seen it in print, it is very difficult for us really to discuss all the questions that have been raised. I rise to ask whether this discussion might not be adjourned, so that we might have the opportunity of carefully considering everything which has been put before us, and then we should be in a better position, I think, to arrive at some conclusion. If I say a few words now I hope I shall not be precluded from making some further remarks on another occasion. We have had both parties condemned this afternoon by the last speaker; it does not matter whether the Government was Conservative or Liberal. I should like to say a few words rather to justify the position of the Liberal party in the House of Commons at the present moment. I am perfectly certain that the Liberal party as a whole is most anxious to maintain our naval supremacy, and I think that we owe a debt of gratitude to the lecturer for this paper, because what the House of Commons requires is to be instructed on this question, because we are not all technical people, and then they will be able to form their own conclusions as to what is necessary in order to maintain that supremacy. Admiral Sir Nathaniel Bowden-Smith spoke with regard to the question of overtime. I think we are all agreed that, generally speaking, in all work overtime is a mistake, but I do not think it was a mistake with regard to the "Dreadnought." The "Dreadnought" was a new ship of a fresh design, and we depended on the result that that vessel might show whether we were to build more vessels of that type. It was necessary, therefore, for us to go on building, and, as I think, it was a wise thing to push forward the construction of that ship and hear the results in every possible way before we committed ourselves to building more of that class of vessel. Therefore I think with regard to overtime in that case it was fully justified

I was glad to hear Admiral Bowden-Smith say he thought we had quite a sufficient number of battle-ships at the present time. The Admiralty Memorandum of 1905, under the former Government, did lay it down that we were to have four armoured ships built every year, but we are laying down now these very large ships, and we want to know whether other nations are going to follow us in that direction.

The CHAIRMAN (Admiral Sir R. H. Harris):—With regard to the suggestion you have made, Mr. Beauchamp, I think it would be desirable, as there are four more gentlemen who wish to speak, if we postpone the discussion till three o'clock to-morrow. That would give a better opportunity for summing up the question, and time to think over the valuable points which Lieutenant Bellairs has brought before us. So I will ask you to finish your remarks now, and we will adjourn to to-morrow at three o'clock.

Lieutenant CARLYON BELLAIRS:—I do not rise for the purpose of replying to the discussion, but I wish to say, with regard to the point which has been made that my paper was not in your hands before the meeting took place to-day, that you are in precisely the same position as the Members of the House of Commons when the Admiralty makes a great change in policy. On the 27th July we had this great change in naval policy sprung upon us in a speech at a week-end and at the back-end of the session, so that now you can better appreciate how we are circumstanced for the discussion of great changes in naval policy when they are brought forward in the House of Commons. No notice whatever is given.

The discussion was then adjourned, and resumed on Friday, 6th December. Admiral Sir R. H. Harris, K.C.B., K.C.M.G., in the Chair.

Commander C. CRUTCHLEY, R.N.R.:—I must apologise for the possession of a voice like a crow this afternoon, but I can assure you I have not come here to croak. There are only a few remarks I wish to make. I should like, in the first place, to emphasise my pleasure, as an old subscriber to this Institution, at taking part once more in a naval discussion in this theatre. They have been too conspicuous by their absence for the past few years, but I hope the interest this paper has excited may have the effect of bringing together some more of those interested in the Navy to discuss matters and to give the public some insight into what is being done. I think the discussion yesterday afternoon was particularly useful, because it showed that there is a rising school of young men who are beginning to take an interest in the Navy, and an intelligent interest. That is a thing that might very well be encouraged. There appears to be an idea that it is possible to run the British Navy on cheap lines. I do not think that a more fallacious doctrine could possibly be enunciated. The Navy is not a cheap instrument. In the hands of the British Empire it has to be capable of fulfilling its duties, and it must be adequate for the work it has to perform. There was a time when the British flag flew over every sea, when we were represented in all quarters of the world; but I fear that in the last, shall I call it, mad craze for economy

in connection with the Navy our flag has been withdrawn from many places. There are plenty of people in this theatre who have experienced the feeling it gave us when we went into any harbour and saw the white ensign flying on even the smallest gun-boat that ever flew the British flag. That was a national asset. Under the new redistribution that national asset seems in a fair way to disappear. There is another way, however, of looking at the matter. It is needless that I should dot the i's and cross the t's when I say it is far easier to withdraw ships from a station than it is to put them back again. Our friends to-day may possibly be our foes within a measurable distance of time. I do not particularise either the Eastern side of the world or the Western side; but the fact is, that on both sides we have withdrawn garrisons and fleets which it might be difficult to replace without the danger of complications. I feel confident it is unnecessary I should particularise what is at the back of my head in making these remarks, but I would most earnestly put forward the statement that the withdrawal of ships and fleets is an easy matter, and the replacement of them an entirely different thing. To come now to the paper. In the opening part of it I find these remarks: "The people lack an historic sense, and no attempt is made, as is done in Germany, to cultivate it in the schools of the country." I must, with every deference to the lecturer, entirely differ from that, and must point out that the Navy League for the last ten or twelve years has been working in schools, and if I might ask for these papers to be passed up to the Chairman, I think they will show, at all events, that considerable progress has been made. The list of the examinations for prizes at the end of that collection of leaflets will show considerable progress in the principal educational establishments in the country. To turn to the Appendix of the paper under discussion, which even now, I regret to say, I have not had time to study properly, there is there a collection of valuable detail, which would, however, puzzle anyone except those who have given the subject the very greatest consideration. In fact, if the ordinary reader tries to analyse ships, their dates of launching, their dates of completion, he gets into a most hopeless complication, and I would most earnestly ask that when this question is being considered, the very plainest issues should be put forward before the people. In this particular relationship I should like to say—and I feel sure my remarks will be endorsed by nearly everyone here—that we may assume at the present time the strength of the British Navy in its *matériel* is perhaps equal—I might say fully equal—to the two-Power standard; and if we were to say, further, that as it is at the full Power standard now it must be maintained at the full Power standard, we should have something the people would really understand. Still further to endeavour to clear up that point, I would say that we have one "Dreadnought" now, and the "Dreadnought" is presumably the ship of the future. It is then absolutely essential that when the Navy Estimates are presented, they should put before Parliament the "Dreadnoughts" laid down, or the equivalent ships to the "Dreadnought" being laid down, by foreign countries, and then that our shipbuilding programme should be equal to those, with that fair margin of reserve which has been held by both parties to be indispensable for the safety of this country. Yesterday afternoon Admiral Fremantle, whom it is needless for me to say carries the respect and admiration of us all, spoke on the subject of cruisers. So far as I can see we are building no cruisers now, except the three monster ones which are called indifferently either cruisers or "Dreadnoughts." I should like to enter a plea for consideration,

whether the commerce of this country does not warrant the laying down of cruisers, either armoured or protected, that can fetch and carry, vessels to do the housemaid work, if I may so phrase it, under the condition of war. In war we should want numbers of them, but I fear at the present time their supply is wholly inadequate.

Mr. EDWARD BEAUCHAMP, M.P.:—I think that some of the observations which I propose to make have already been dealt with by the last speaker. As far as we are concerned at present, I think there is no doubt that in battle-ships alone we are fully up to the two-Power standard, and that there may be satisfactory reasons alleged why we should for the moment mark time. That is merely looking at it from the point of view of the present moment, but I think we have to look very much further than that; we have also to look to what the other Powers propose to do. We have at the present moment the "Dreadnought," which is supposed to be, and I hope it is, the finest battle-ship in the world, and we are laying down three more of those vessels this year and two at least next year, and perhaps a third one, dependent, of course, on the result of the Hague Conference. Then, when these ships are built, we shall be ahead of all the other nations—certainly of any one nation, and I think of any two nations: we shall be ahead of them in having the finest battle-ship fleet in the world. And besides that we have those vessels which I ventured in the House of Commons to criticise, the large armoured cruisers, which are said to be equal to battle-ships. I think they must be in some way, at any rate, inferior to the "Dreadnought," but I think they are far superior to anything which we require in the way of cruisers. I do not believe that you can successfully handle something which has a double object; you ought to have a battle-ship or a cruiser. But beyond that, looking ahead, we have to consider whether we shall not in the near future have to build a considerable further number of battle-ships, and whether it is not more efficient and really more economical to have a regular programme for the building of battle-ships than to build three one year and seven in another year. We heard yesterday that, in consequence of our present system or new system of recruits for the Navy, after a man had become efficient he was passed out of the Service and found occupation in another country. I think that also holds good with the artificers and people who work upon the building of ships. They must have regular employment, and if you have to put a number of men on at a particular time for the building of a certain number of battle-ships, and then reduce that number afterwards, you must necessarily throw a large number of men out of employment, and those men have to find employment at other places, and I think there are other countries—one country in particular—which will be very glad to have our first-class workers. With regard to the cruisers, I was very much surprised yesterday to hear from Sir Nathaniel Bowden-Smith that he thought we have a sufficient numbers of cruisers. A large number of cruisers we have will in a very short time, I believe, become perfectly obsolete and be put upon the scrap-heap, and that will leave us with a very great shortage in cruisers. I remember when Sir Geoffrey Hornby read his paper before the London Chamber of Commerce in the year 1838, he distinctly laid stress on the number of cruisers which it was necessary for this country to have, and he said: "You may have to watch a particular place, and it is necessary to have three cruisers on the spot in order to do it. If you have three cruisers on the spot it will be necessary to have five cruisers in order to carry out that work efficiently." That struck me

very much at the time, and I sincerely hope that in the near future the consideration of the commerce we have to protect and the attention that is being given to the problem by the Admiralty at the present moment will result in the building of more cruisers. It is always very difficult, I think, to obtain any very great amount of information in answer to questions that may be asked the representatives of the Admiralty in the House of Commons. I saw it stated a little time ago in the *Standard* that all the ships of the "Royal Sovereign" class were going to be put into special reserve, and that they would have simply skeleton crews. I asked the question whether it was so, and the reply which I received was somewhat cryptic. The answer was: "I am not in a position at the present time to give any information; as the scheme for the re-arrangement of the ships in commission in reserve is still in process of development." I do not know what that development may be, but I saw two days afterwards, and it was said to be an official statement, that two vessels, at any rate, of that class had been placed in the special reserve with skeleton crews. Now, I think that if the Admiralty have the intention—and I rather fancy that they have—not to spend any money or much money on the maintenance and upkeep of these ships, it will be fair to us and fairer to the country to let us know exactly what they do mean. Of course, we have their own statement of the Admiralty policy on the Navy for 1905. What does it really mean to put these ships into commission with a skeleton crew? It means practically, according to their own statement, that you are getting rid of these ships as efficient units. They were speaking of the old system, where a ship was paid off and the crew dispersed and another crew turned over to it. That was suddenly to extinguish certain units of organised efficiency. A ship manned by officers and men who neither knew the ship nor knew each other, it was said, could not be expected to reach a standard of fighting efficiency for at least six months. I gather from that, that ships placed in commission in special reserve, with merely a skeleton crew, would, on the Admiralty's own showing, mean that those ships would not be ships of fighting efficiency for at least six months. I think that perhaps less time than that would give us ships of fighting efficiency. But if they are going to place these ships in the special reserve in this way, which has been called the vestibule of the scrap heap, and those ships are going on to the scrap heap in a few years' time, I think they ought to let us know, and we must continually insist that these ships that are going out of employment should be replaced by a sufficient number of newer types of vessels.

Sir WILLIAM WHITE, K.C.B. (late Chief Constructor of the Navy):— I feel some diffidence in joining in this discussion, not that it is a subject in which I am not interested, but because there is a danger of anything I may say being attributed to partiality on my part in favour of ships which I have designed. But I do not propose to discuss designs of ships, and propose to join in this discussion because it is a matter for congratulation that a naval debate should again take place in this theatre. Of late there has been a tendency to suppress discussion, to state one set of opinions strongly, and it is time another course was taken. Lieutenant Bellairs' paper traverses so much ground that it is absolutely impossible—neither would it be desirable—for me to take up scriabin the various points. He has spared no pains to ascertain the facts; he has summarised those facts, formed his conclusions, and stated them definitely. We know what he means, and we are bound to respect

his opinions, even if we dissent from them. I will first refer to matters which concern me as a naval architect, not as the designer of particular ships. First, there is the question of displacement tonnage. Everybody here knows that the displacement tonnage of a ship means her total weight when floating at a fixed water-line, which may not be the deepest load water-line, and for most war-ships is a long way from the deepest load water-line. For any assigned draught of water it is possible to ascertain the weight of a ship when you know her form. The lecturer properly says that merely to add up displacement tonnages of ships on the effective lists of different fleets and to take the respective totals as measures of relative fighting force is incorrect; in fact it is absurd. But there is an important sense in which displacement tonnage is a fair and useful measure. At any given date, when invention in relation to war-like material and structural arrangements has reached a certain point, one may be sure that if one naval architect is able to use 14,000 tons as his capital, and another naval architect, equally well informed and equally capable, is only allowed 12,000 tons, the man who has 14,000 tons must have the advantage. The distribution which may be made of the greater tonnage may not be universally approved, but it cannot be denied that if one man is working with 14,000 tons and another with 12,000 tons at a given date, he ought to produce a better fighting machine. Recognising that limitation, in comparing ships designed at or about the same date the displacement tonnage method is useful. For example: Going back to the Naval Defence period of 1883-9, I was responsible for advancing the displacement of battle-ships to 14,000 tons at a time when other Navies kept much below that figure; and undoubtedly we got good out of the larger displacement. Advance in displacement does not always mean a corresponding or proportionate advance in cost. As a matter of fact, we built the "Royal Sovereigns" for less money than the "Inflexible" cost, although she was of less displacement, and for not much more money than many smaller foreign ships were costing. Therefore, you may take it as a principle that ships of a given date which are of larger displacement ought to be more powerful fighting machines. In that respect, since Great Britain led the world with large displacements, there ought to be, and I believe there are, corresponding advantages which I need not particularise. On the other hand, if a ship of any selected date is compared with a ship designed long after, when inventions in gunnery, in armour, in propelling machinery have gone further, it may happen that the ship of earlier date may be more powerful than the ship of later design, because of her smaller displacement. We have generally been building larger ships than were built abroad contemporaneously, and this fact is important. We have had the necessity for greater sea-keeping power, greater coal endurance, and have produced real sea-going ships, not merely floating forts, such as have been designed and built for coast defence or for employment near the coasts of other countries. Although it is true that the design of later date has many advantages, it may still happen—in many cases it has happened—that ships of earlier date, because of their greater size, are more powerful fighting machines than later ships of smaller size. One cannot lay down any general rule, and exact comparisons are difficult. I do not like to refer pointedly to foreign vessels, but I have in mind vessels of about 11,000 tons belonging to a foreign Navy, built some years after the "Royal Sovereign" class. In those ships defence was deliberately minimised and powers of offence were increased. The hull armour consisted of a narrow belt not extending over the whole length, and this belt only rose about 2 feet above water

when the ships were fully laden. Above the belt there was simply thin steel plating. These foreign ships had the advantage of modern armour and of other improvements, in propelling machinery and guns, introduced in the interval between their design and that of the "Royal Sovereign" class. Yet I say unhesitatingly that the "Royal Sovereign" class were still the more powerful fighting machines. No general law or simple rule can be laid down for these comparisons. One must not trust tabulated statements of maximum thicknesses of armour. There are ships in which the reputed thickness of armour can be found only on a few plates on the sides; such things are not unknown even in modern times. We must have full knowledge in order to make true comparisons. We know the faults of our own ships, and there is a tendency frequently to exaggerate these faults. That may be the safe course to take in estimates of relative fighting power, but it may be carried too far; and when talking with foreign friends, I find that they think it has been carried too far, and they say it is clever on the part of English writers to depreciate what we possess in order that the public may be led to believe that we are not so well off as we really are. Turning next to unarmoured ends, one finds a discussion which goes back for more than 30 years, and one gets a little weary of it. It reappears periodically, especially when the Royal Navy is relatively strong. Lieutenant Bellairs says we are all right at present as regards naval force, and, being well off, the advocates of large building programmes recur to the subject of unarmoured ends as a source of weakness. Admiral Fremantle yesterday said that naval officers had always opposed unarmoured ends; but by reference to Parliamentary Papers for 1889 one can see that it was a Naval Committee which was associated with the Board of Admiralty in considering alternative designs who decided unanimously that the ends of the "Royal Sovereign" should be unarmoured. Alternative designs which I had prepared had the bows armoured, but these were deliberately set aside as being, in the opinion of the naval officers consulted, not so good as the design with unarmoured ends. The weight of naval opinion at that time led to the disposition of the armour adopted in the "Royal Sovereign" class. For every ship that has been designed subsequently the same question has arisen; various alternative designs have been put before the Board, and the arrangement of armour which has been adopted in every instance was selected and approved by the Board. Armaments have changed, Q.F. guns have come into use, other conditions have been modified, but writers and speakers who concentrate attention on the absence of armour from a certain portion of the ends of ships, are apt to overlook considerations more vital to the safety, buoyancy, and stability of ships. The small vertical extension of armour to the ships in foreign fleets is not regarded by them, although it involves serious dangers. In many first-class foreign ships the armour belts rise only 18 to 24 inches above water when the ships are deep laden. Above the armour belt there is nothing between the interior of the ships and the outside water except $\frac{1}{2}$ inch of steel; in many cases there is no sub-division of that internal space. Frequently heavy guns are placed in armoured barbettes, perhaps 20 feet to 30 feet above the water, and these barbettes are only connected with the armoured hull by armoured tubes. I ask whether or not such a limitation of the vertical extension of the armour is a less danger than the limitation of its longitudinal extent to, say, two-thirds of the length of the ship? The point for consideration is: Which is, on the whole, the better disposition of armour, within fixed limits of weight. My views on the armour question are not at present under discussion; we are talking about principles. My views

have been expressed, and anyone who cares to read them can do so and agree or disagree. But the problem in every case in this : Given a certain available weight of armour, in what way will it be best distributed for a particular ship? Each case has to be considered on its merits. I will refer to one illustrative example in the French Navy, which I can do without offence, because it has been publicly discussed in France. Vessels of the "Montcalm" class are fine, upstanding cruisers, designed by my friend, M. Bertin; but in some of the first vessels of the class, wherein the hull armour rises about 8 or 9 feet above water, the guns are placed a deck higher, and there is an unarmoured space below the gun stations open to serious attack by shell fire from Q.F. guns. This feature was severely criticised, and has been altered in later vessels. This case illustrates the necessity for taking all circumstances into account in considering the relative protection of war-ships. We do not usually know, when attempting comparisons, as much about foreign ships as we know about British ships. This is especially true of late. We live in an age of secrecy. It is considered that the British public should not know what armour is carried by new ships building for the Royal Navy. I do not in the least agree with such secrecy, and I never favoured it in my long official career, and am confident that those who wish to know the particulars for British war-ships can and do know at early dates after building begins. Let us live in the open as much as we can. There are many things we should not disclose, but to conceal the general dimensions of a ship or to treat her armour and armament as secrets after construction has begun is ridiculous. I should like to refer to remarks made in the paper with regard to the battle of Tsushima. A good deal is made of what happened to ships with unarmoured ends; but did they fare worse than the "Suvoroff" or the "Emperor Alexander III.," which had complete armour belts? The Russian accounts show that although many ships had complete belts, that armour was of no use. The belts were narrow near the bow and stern; but even if the armour had been carried 7 or 8 feet above water, when ships are driven head to sea and the light side plating is perforated, large quantities of water will enter. Having made a careful study of the whole of the data, so far as I can reach it, and consulted Russian, Japanese, French, Italian, and other authorities, I am of opinion that the sinking of these great ships at Tsushima was due principally to injuries in their thin side plating and protective decks. Water came in above the armour, the decks, having large areas, presented magnificent targets, and through injured portions of the decks the water passed below; the ships plunged head foremost, and were overset. To speak of a mere continuation of the armour to the bow of a ship as being in itself an immense increase of safety, and to pay no regard to its very small vertical extension above and below water, is to beg the whole question, as anyone familiar with the conditions of stability in ships will admit.

A MEMBER :—May I ask you to express an opinion on the excuse given for placing the "Royal Sovereign" class, whose ends are unarmoured, on the non-effective list?

Sir WILLIAM WHITE :—These ships are my children, and I am, perhaps, a partial parent. A time comes, no doubt, when every fighting machine must be put aside; but I am far from believing that time has come with the "Royal Sovereign" class. Passing on to the question of progress in invention as affecting war-ships, I take exception to an opinion expressed

by Lieutenant Bellairs on page 4 of the paper. He speaks about turbines as if they involve increased consumption of coal. It is true that at the outset turbine engines of great power when run at low speeds were expensive of coal. It is also true, as anyone will see who will study more recent trials with auxiliary turbines, that they are not now relatively expensive of coal. The steam turbine is an invention which must sustain development as time goes on, but already a point has been reached when it compares favourably with reciprocating engines as regards consumption of coal, even at cruising speeds. With regard to water-tube boilers and their more frequent renewals, I am inclined to doubt Lieutenant Bellairs' opinion; much depends on the type of boiler and the treatment it receives. If the type is right and the treatment is reasonable, there is no reason why water-tube boilers should be costly in maintenance. Inventions, to be of real service, must be treated wisely. As an invention progresses, management must become more skilled. That has been so in machinery rooms, and it must be so in boiler rooms; there is no reason why it should not be so. Risks necessarily run are not on one side only in contests between nations. Take for example water-tube boilers. As long ago as 1892, the French, who were by no means given to taking unreasonable risks, had come to the conclusion that the balance of advantage lay on the side of water-tube boilers, and they adopted them. That meant a gain of a knot in speed with battle-ships as compared with ships having cylindrical boilers. On my visits to France I found out the condition of things; it seemed to me their action necessitated corresponding action here. We might not adopt French methods, but when improved steam generators were discovered and adopted abroad, clearly the problem required to be dealt with here. And we had to deal with it on a large scale. We had to learn our lesson as we went along. There were troubles, which happily now have been largely overcome, and which I believe will eventually entirely disappear. The main contention of Lieutenant Bellairs relates to our shipbuilding policy. Elsewhere I have dealt with the comparative rates of building in England and abroad. I will simply add that finance really rules rates of production. To build fast you must spend a lot of money. I am not referring now to phenomenal performances of which we have heard recently; I am referring to our normal procedure. It is true generally that plenty of money must be spent, and that there must be good organisation, skilled men, materials to hand, and everything arranged if you wish to build war-ships rapidly. The cost per unit of war-ships is growing. It is quite clear, therefore, that financial considerations will become even more important in future. With a given expenditure fewer ships can be built rapidly if they individually cost more; and to maintain both rapidity and numbers, the annual expenditure must be correspondingly increased. That is a game we can play, and have played. We have been at financial war in naval affairs for the last 20 years; we have won because we have been bold and courageous; we have never failed to match what was likely to come against us; we should not fail in future, and are not failing at present. Let us take the pronounced intentions of France and Germany as disclosed in their Naval Estimates. What do we find? Lieutenant Bellairs has said that at the present moment we are all right. It is a comfort that he should have that feeling. He wants to keep us right; we all want to keep right. We can believe that of the present much-abused Government. I do not believe any responsible British Government would do anything else. I entirely dissent from the doctrine that only the latest type of ship counts in naval affairs.

The CHAIRMAN :—That is not set forth in the paper.

Sir WILLIAM WHITE :—I did not say it was; but the view is often put forward. Taking it on that basis, and admitting that we are at the present moment in a good position as regards naval force, while we have a large shipbuilding programme, it is well to note carefully the intentions of France and Germany, disclosed in their Naval Estimates. The French Naval Estimates, including the detailed finance for 1907, have been in my hands for more than a month, and I have gone through the whole of the figures thoroughly. The French intend to finish two battle-ships by the end of the year 1910. There will be a lot of money to pay after that, but the ships will be ready, although the final instalments are to be paid in 1911. Four other battle-ships are to be ordered this year, but are not to be laid down; they will be finished, according to the latest statements, in the middle of 1911. In the United States there may be two large battle-ships completed by the end of 1910. In Germany the three armoured ships proposed for 1906 are not yet begun. German authorities have found, as everyone does, that when a new type is to be built it is worth while taking trouble and thinking out arrangements before starting work. Supposing they start immediately, according to their programme they will take three years to build the ships. It is not a question whether they could build more quickly, but what they propose to do. What shall we have ready at the end of 1909? The "Dreadnought" is now approaching completion, and we are told she is equal to any four battle-ships.

A MEMBER :—What is your opinion on that point, if I may ask it?

Sir WILLIAM WHITE :—I would rather not answer! I did not come here to give opinions on types of ships. We shall have also the "Lord Nelson" and the "Agamemnon," ships which compare well with the new type of battle-ships to be built in France as regards armour and armament. Then we have three "Invincibles," which a previous speaker said were "quick-change" ships, appearing sometimes as cruisers and sometimes as battle-ships. At all events, in armament, so far as the published descriptions go, the writers of which seem to be well informed, they are armed as battle-ships, although no official statement has been yet made respecting their armaments. Lastly, we shall have three new "Dreadnoughts," two of which are already in hand and one about to be laid down. I think Lieutenant Bellairs will agree with me that these will be ready.

Lieutenant BELLAIRS :—Yes.

Sir WILLIAM WHITE :—So that we shall have nine ships by the end of 1909; Germany might have three, including one large cruiser. These newest ships, we are told by those who profess to speak with authority, are the ships which will determine our fate. If we can build, as I maintain we can, more quickly and in larger numbers, and if our position in this new and much advertised type of ship at the end of 1909, will be as I have stated it, it is quite clear that we can sleep in peace for another year.

Vice-Admiral W. H. HENDERSON :—I think if you will look at Appendix G you will perceive the exceeding difficulty of this country, under any standard that may be laid down, sticking to a programme. It is not only that the political strategical situation alters, but the nations concerned, with the exception of Germany, vary their shipbuilding programme from

year to year. Programmes are of recent date, and really the only nation that has strictly provided a consistent one is Germany. I think, if I remember correctly, that both in the House of Commons and the Press, after the 1888 and 1894 programmes, strong objections were urged to programmes. Those objections were put forward at the time, and, as Sir William White says, "finance governs the question." The House of Commons is, I feel, reluctant to grant money in advance; it does not like binding itself to the future; it prefers always to have the Votes taken year by year. In every single instance, whether it is a small detail or a large detail, it carries out that policy as closely as it can. I would observe that in any business, whether it is a private concern or whether it is a national concern, you must trust somebody; you cannot get on without it. In the present case the watch-dog we have to trust is the Admiralty. The Admiralty in the past have shown that they are worthy of the nation's confidence, and I do not care whether it is this Admiralty or any future Admiralty, or whether the Government for the time being is a Conservative Government or a Liberal Government or a Labour Government; I am perfectly certain that the Admiralty may be trusted to sing out if there is the slightest danger of the nation getting below par in its naval strength. I do not think we need be afraid. They are the people whose business it is. They have the latest and most accurate information; they have a heavy responsibility. When Lord Tweedmouth publicly says that he will not allow the Navy to get below par, I think the nation should be satisfied. I do not wish to depreciate in any sense the value of the paper that Lieutenant Bellairs has given us; I consider it is a most valuable and interesting paper, alike to the public and to everybody concerned, and it must be a great advantage, for papers and discussions of this sort do a great deal of good if it is only in keeping our watch-dog (the Admiralty) from having forty winks. There was one point mentioned yesterday in the discussion that I should like to say a few words about, namely, the question of overtime. Years ago the dockyards were very expensive in the matter of overtime, and I quite agree with what was said, that overtime is not worth the money that is expended upon it, and that for three reasons: First of all, it keeps other men out of employment; secondly, it unduly increases the hours of work; and thirdly, it is true to say that I do not suppose in most cases you get half the value of the money spent on it. That is a general conclusion that all will agree with, I think; but to show you that efforts have been made to reduce overtime, I can give you figures for Devonport Dockyard. The overtime spent in 1902-3 was £28,391. I set my face against it, and in 1903-4 it was £18,035; in 1904-5 it was £13,216; and in 1905-6 it was down to £8,337. I would make one exception to the question of overtime as it has been in use up to date, namely, that when you want to build a ship very rapidly it is absolutely essential to use it under the conditions which have pre-existed; but personally I am strongly in favour of shifts instead of overtime where pressure is necessary. With the electric light in the dockyards, and further improvements, I have no doubt that, although naval architects have opposed the shift system of ship construction, the facilities will be so great that they will be able to undertake it. The Admiralty, I may say, within the last year or two have very much set their faces against overtime, and I know that recently at Devonport there were constant reminders to us that no overtime was to be utilised.

Fleet-Surgeon W. G. HOLME, R.N.:—It will be perfectly obvious to every executive officer that as I am but a seafaring physician I cannot know

spend money on everything, and you do not want so much excess in *matériel* in that case.

Commander W. F. CROBNE, C.B., R.N.R.:—I should like to express my appreciation of this very able and valuable paper, which has no uncertain ring about it, and is an embodiment of Imperial and patriotic ideas. While we require an efficient Army adequate to our needs in time of peace, and capable of rapid and large expansion in time of war, no one can deny the fact that by the Navy the Empire must stand or fall. Now, what is the British Navy? Why, simply our great national insurance, and I venture to assert that if we spend thirty millions a year, or even more, upon it, the premium is but a comparatively small one, when we take into consideration the enormous interests involved. Personally I am one of those who maintain that the Services, whether naval or military, should be entirely above party, but I am afraid that they are too often made the shuttlecocks of politicians and their party exigencies, the real interests of the Empire being neglected or lost sight of. The lecturer has given us a table showing the time occupied in building certain classes of British battle-ships and the time occupied in building certain German battle-ships. The "Canopus," "Formidable," "Duncan," and "New Zealand" classes appear to give an average of a little over three years and six months, while for the German ships given in the same table it is only three years. The "Dreadnought" has been built with great rapidity, but the question is, how often we could go on repeating ships of that description in the same time. Would the armour be forthcoming? Would the guns be ready? I think that is a question that should be definitely answered. I have just had a memorandum handed to me in which it is pointed out that the German battle-ship "Schlesien," launched last April, was put afloat in less than six months from the date of her first keel-plate being laid down; and yet it was stated in the House of Commons that we could give the German shipbuilding yards eighteen months' start and then catch up with them. Lieutenant Bellairs has alluded to the coming Peace Conference. I am not a believer in either Peace Conferences or Peace Societies. I have read some of the drivel emanating from the latter, and I do not suffer fools gladly. Undoubtedly the best guarantee of peace is the being prepared for war. A few years ago we had a Peace Conference at the Hague, and we were told that it would inaugurate an era of arbitration and universal peace among the nations. But what did we see? Why, in a very short time the outbreak of the Russo-Japanese war, a conflict of gigantic proportions. We are now within measurable distance of another Peace Conference, and I am already wondering in which direction we shall next have to look out for squalls. It is understood that at that Conference a proposal will be put forward with a view to exempting private property from capture at sea in time of war. Such exemption would be a delusion and a snare, and would still be dependent upon the will of the Power that was strong enough to disregard it. Even in the twentieth century, war cannot be made with rose water, and I may quote the words of Clausewitz: "War has but one means of action—force. Its use is absolute. To introduce a principle of moderation into the philosophy of war is to commit an absurdity." Going further, an absurdity is a blunder, and Talleyrand said that a blunder was worse than a crime. But a short time ago we were engaged in a great struggle in South Africa, and no war in the history of the world was ever waged in such a humane manner, although we were told that we made use of the methods of barbarism. Probably we were wise in our generation, as

it was the intention to bring the Boers under our rule, and we wanted them to settle down quickly after the war was ended; but there is not the slightest doubt that if we had not formed concentration camps and fed our enemy's wives and children, the war would have been finished in a much shorter period. For my own part, I do not want to see private property nominally exempted from capture at sea in time of war, and, with a Navy adequate to our needs, we shall be very well able to take care of ourselves in the future as we have done in the past.

Colonel F. N. MAUDE, C.B., Hampshire R.E. (Vols.), late R.E.:—After listening to the most interesting and able speech of Sir William White on the question of the financial bearings of the whole problem, and Commander Caborne's remarks about the insurance, it comes home to me that the only way in which we shall ever get the public to understand the importance of the question of defence is to attack them on the financial side. We shall never induce them to take a proper interest in the subject until we go to the bankers and make the bankers understand what forty-eight hours of war will mean to England. It is impossible to produce reliable figures, but we can say that our losses would be beyond any one man's time to count or to handle. It is a reasonable certainty that every penny of savings, savings for old age pensions, for insurance funds, everything we have of that kind, all the money saved in England by the thrifty population, would be absolutely lost, and old age pensions and insurance funds would be broken up by the terrible death rate that would follow on eighteen months of war. I do not mean simply the killed and wounded in battle, but the terrible death rate that would immediately begin in our great centres of population, such as London, Birmingham, Manchester, Leeds, and so on, through the suffering that would crush out all the weaker people who now survive because food is cheap and plentiful. The moment the price of food rises the death rate will be enormous, so enormous that, practically speaking, it is more than doubtful whether any insurance company could pay the insurances they have granted. Every doctor, I believe, could confirm this. The next point is: What would happen when the enemy came to England? The whole of the banking reserves of the county banks or the joint stock company banks would be affected. All the banks rely on the Bank of England to see them through. Of course, there is a good deal of fiction about the bank reserve, and at such times it is possible to get an Act of Parliament suspending the Bank Act; but before it would be possible to get the suspension of the Bank Act passed there would be, in the case of war, a month or six weeks of ruin—ruin widespread in every direction, and the existing shareholders in the banks, the directors, and all interested would feel the pinch. Now, instead of playing the "war game" as we sometimes do, let us have a "finance game" for bank managers and City men, and ask them to see how they would stand after forty-eight hours' war, with consols dropping three points an hour, as they easily might do. I think when once they had entered into the spirit of that game, playing at so much per point, as they did in the school which R. L. Stephenson describes in "The Wreckers," where Stock Exchange gambling was taught as part of the regular curriculum, I think they would realise as they never did before what war must mean to them. Then we shall have no difficulty in getting money for the fleet or the Army. The fleet, of course, comes first. I think you could get men to understand in that way. It is no good merely saying that the results of war will be so dreadful that it must never occur, as did Lord Overton before the celebrated commission of 1857.

He summed up the whole question in one passage, the most magnificent passage of English prose I think I have ever read. In it he showed the extraordinary effect the collapse of the finances of the country would have in every home in the country, and he wound up with the words: "The prospect is so terrible that it *must never be*." From that day forward all financiers have contented themselves with saying: "It must never be," thinking because they say so the enemy will see it from that point of view too. It is probably because that sentiment is well known to Germany and France that for that very reason the thing will happen—they know our weakness, and quite understand how to profit by it.

Mr. A. C. BECK, M.P. :—It is with great diffidence that I rise at all this afternoon; but I thought, as one profoundly ignorant of naval matters though profoundly conscious of their great importance to our welfare as a nation, that I should like to try and put forward very briefly the average opinion of the average supporter of the Government. I was present yesterday afternoon, and, in common with other speakers, wish to thank Lieutenant Bellairs for his very valuable paper, but I was somewhat struck with some of the speeches made towards the end of yesterday afternoon's meeting. I think we are perhaps, rather inclined to forget that we are all of us, to a certain extent, faddists, and when I say faddists I mean that we all have various points in our mind which we consider of extreme importance. I am happy to think that, as far as I know, almost every thinking man I have met is agreed that the Navy is the most supreme of those points, but the fact remains that there are many other points also of great importance in people's minds, and the present Government has been returned, as you all know, with its head full of schemes of social reform. Those schemes of social reform mean money. To take one example: I personally am greatly concerned and interested in the welfare of our agricultural districts; I believe the absence of population in the rural districts is a very grave menace to the future welfare of this country. But if you are going to re-populate the rural districts of the country you want money just as if you are to maintain your fleet you want money. The Government's business is to reconcile the various claims made upon it. Something like three or four times a week I am called in the House of Commons to a Committee meeting of various Members of Parliament, whose whole intention is to claim money from the Government. We sign petitions, we get up agitations, we button-hole Ministers, all with a view of getting them to spend money. It is well known to everyone who takes an interest in finance at all that during recent years a large portion of our floating debt has been in the hands of foreign bankers. At any moment they could have called in that debt, and we should have had to meet it, and I believe the result would have been almost as disastrous to this country as the loss of a great fleet action in the Channel. That is Mr. Asquith's problem, and it is the difficulty of meeting it which I think some of the speakers yesterday afternoon did not realise. That is the reason I am speaking this afternoon, not because I venture at all to argue on the merits or demerits of Lieutenant Bellairs' paper. Personally I believe Lieutenant Bellairs is doing a good work in Parliament by continually agitating for the efficiency of the Navy; but you must remember, in justice to Members of Parliament, that there is a great diversity of opinion even in naval circles on these matters. As a humble Member of Parliament, I sat here this afternoon and heard Sir William White's most valuable remarks, and they have a great influence on me, and before opposing the Government I should have to consider all these things. I

have spoken to a great many Members of Parliament on this subject, and my own opinion is that the House of Commons, with remarkably few exceptions—probably a couple of dozen exceptions—will always vote the Government such supplies as they require, if they are told there is the least danger of our naval supremacy being lost. But we must, as ordinary humble laymen, follow the Board of Admiralty. If any of you, gentlemen, can prove conclusively to us who sit in the Commons that the Board of Admiralty is absolutely wrong, I believe we would revolt almost to a man. I would not venture to speak for the Socialists, but I can speak for ordinary Members of Parliament. This is our difficulty, and this is the one thing I would venture to bring to your notice this afternoon, that we are not deliberately hostile to Army or Navy expenditure. I believe every man almost in the House of Commons is prepared to make any sacrifice to ensure the safety of the Empire; but, if I may speak very frankly, there is a certain danger that the constant cry of "Wolf" may defeat its own object. You must remember that in the House of Commons we represent a large number of votes. On every platform I have sat there was a great deal of talk about undue taxation and high rates, and I should not have been a Member of Parliament to-day if I had not promised to do what I could to reduce the taxes. I safeguarded myself by adding that I considered money must be spent upon the Navy to any needful degree. Beyond that I stand here pledged to economy, and so does practically every Member of Parliament. Even my opponent, who is not so happy as to be a Member, if it is a happiness, which I rather doubt after ten consecutive months of it, was also pledged to economy. I humbly suggest to those here who take such a great interest in naval affairs, and guide public opinion, that they ought to confine themselves to pressing for what is absolutely essential for the welfare of the Navy. What Lieutenant Bellairs says is perfectly true. If you can come to the House of Commons and say that a thing is absolutely essential, I believe you will get it without any division at all; but as long as there is divided opinion we cannot hope to achieve that result. I thank you for listening to an ignorant layman, and I can only assure you what a pleasure and great education it has been to me to come here, and I hope it will not be the last time I shall be allowed to be here.

Mr. ROBERT DUNCAN, M.P.:—If not out of place, I should like to say a sentence or two in regard to one matter of naval strength of which, as a body of experts helping to form and instruct public opinion, we should take notice, and that is the expenditure on coaling-stations. Coal, or whatever fuel is used, being the life of the Navy, must be looked to, and if on that matter we can bring, individually or collectively, any influence on the Government, it might be exerted to see that a due amount is spent on coaling stations, well selected, well equipped, and well guarded, all over the world.

Lieutenant CARLYON BELLAIRS, in reply, said:—The reward of any lecturer who comes to this Institution is the discussion which he evokes, and I must confess that I am very well satisfied with the discussion. We have had representatives of almost every branch, representatives of the Army, the Navy, and the most distinguished naval architect of our time in Sir William White. First, I should like to devote my remarks to something Admiral Henderson said. He made some very valuable remarks about overtime. We must remember that if we give in to the belief that we are not to work overtime, then all the ideas of rapid shipbuilding to a

large extent fall to the ground, for though the Admiralty promised not to work overtime in connection with the new "Dreadnoughts," they have begun already to work overtime in preparing the slips, although the Labour Party has not yet found it out. Admiral Henderson said something about trusting the Board of Admiralty. If we look back on the secret history of the past, such as that revealed by Admiral Sir Vesey Hamilton, when have we found reason to trust the Board of Admiralty, and, in many respects, the Sea Lords of the Admiralty? They brought forward a Memorandum of November, 1905, laying down the minimum programme, after pressure for economy had been brought to bear on them by the last Government. Since then we have lost the "Montagu," we have had the French and German programmes, and now we wonder why there is not an increased programme. Instead of that we have reductions. I think, to a large extent, therefore, they have put themselves out of court. If we are to give a complete trust to the Board of Admiralty, that would apply to all the discussions. We must discuss these things if we are to have a proper state of things. Sir William White gave us some very valuable remarks about the absurdity of the secrecy in connection with the new ships, and Captain Caborne referred to the fancy quick building of the "Dreadnought." I do not believe the "Dreadnought's" guns are the guns that were bought for the "Dreadnought"; I believe they were the guns ordered for the "Lord Nelson" and the "Agamemnon." I know that six months before the ship was laid down material had been ordered, and I know an average of 1,200 men were daily working overtime on board that ship. No men worked overtime on the other battle-ship building, the "Britannia," and over twice as many men were daily employed on building the "Dreadnought." At times the numbers went well over 1,500 working overtime. I now come to the vexed question of unarmoured ends, with which Sir William White and Admiral Fremantle dealt. Sir William White referred to the battle of Tsushima, and referred to the complete belted ships. He took them as instances of belted ships sinking. They were heavily loaded ships, carrying stores to Vladivostok. The effect of overloading was precisely the same as unarmoured ends; there were unarmoured portions of the ship in contact with the water-line, and that is just our contention of the danger. I have given a list of the unarmoured ends in Appendix B, and I hope that will be studied. You will find that only 13 battle-ships of the British Navy are completely belted from end to end, and that is a most vital point in the view of naval officers because of modern gunnery. We know perfectly well that the reason why the Germans built their battle-ships with large secondary armaments was because we had this enormous number of unarmoured end ships in the British Navy. They said: "We can bring our 6-inch guns to bear on the unarmoured portions of the water-lines of British ships." Sir Nathaniel Bowden-Smith and others referred to our being up to the two-Power standard at present, but the question of our strength at present was a question we were considering three or four years ago, and has nothing whatever to do with what we have to consider now. We introduce a shipbuilding programme not according to our strength at the present time, but according to what our strength will be four years hence in relation to the next two naval Powers, and that of course is the most important point we have to consider. I assert—and it is confirmed by every single table in the Appendices—that we shall not be up to the two-Power standard four years hence if the curtailed programme for 1907-8 is persisted in. Then there is the question of the rapidity with which we build. It shows the danger of a great authority

like Sir William White making statements in the *Times*. Sir Nathaniel Bowden-Smith immediately comes forward and says we build much more rapidly than other nations, and the same statement was made by nearly every speaker in the House. Sir William White never disputed my contention in his speech, never attempted to dispute the fact that the Germans build just as rapidly as we do. He told us it was a question of finance, and no one doubts that it is, and if you choose to vote more money each year you can build quicker. I have analysed every single battle-ship built in recent years, and shown that the statement made in the House of Commons by the Prime Minister is not true, viz., that the Germans do not build as rapidly as we do. What Sir William White showed in the *Times* was that we have greater resources, but that has nothing to do with the rapidity of building. Will Sir William White go as an umpire at a race meeting when a 100 yards race is being run and award the prize to the loser on the ground that the loser would have won if it had been a half-mile race? Such an umpire would be hissed off the course. Really, in a case of such importance as this I do not think the matter ought to be looked upon in that way; it is simply throwing dust in the eyes of the public. By going into elaborate calculations as to our resources and saying therefore we are building faster is throwing dust in the eyes of the public. Neither nation is trying to build up to its resources. The question of our ability to build 16 armoured ships a year and the Germans 8 does not enter into the matter at all. Sir Nathaniel Bowden-Smith made comparisons of our strength with Germany alone. The whole idea of being absolutely certain of our ground is that we may have to fight two Powers and even to provide for a neutral Power, and certainly we should not be able to put our best ships into the Channel and leave all our unarmoured end ships in the Mediterranean. The French are concentrating the whole of their effort in the Mediterranean, and that is put forward in the papers as an instance of the friendliness of the French for England. But do not the people who use that argument see that it is also an instance of the friendliness of France for Germany. France is putting the whole of her fleet where there are important British interests, and taking away her fleet from near the North Sea, where all the German interests are concentrated. Now, Sir Nathaniel Bowden-Smith referred to scares. Well, nobody wants a scare. I do not suppose anybody who came to this meeting thought we were trying to engineer a scare, or he would have stopped away. We look on our efforts just now as purely educational. But if you do not increase your programmes in future years we say you will get a scare right enough. We want to avoid a scare. Mr. Beek made a speech with which I was delighted. I wish the attitude of every Member of Parliament to this question was the same as his attitude. He wants to be convinced and get at the truth, and if he gets at the truth I think he will be perfectly fearless in maintaining our naval supremacy. I wish they were all like him. He mentioned what is a most important statement: that we meant permanent social reforms, and that costs money, which will have to go out every year. That proves my statement that the money we are saving now is looked upon as already allotted for permanent reforms—that is to say, it is entirely lost to the Navy. That is the danger of arguments like Sir William White's in favour of postponement of ships. Now that the Sea Lords have allowed the shipbuilding votes to go down, and promise that they will go down much lower next year, we shall all have to put our shoulders to the wheel before we shall be able to get those votes up again. Sir William White never contended that you would not have to build in the

future; he said we might safely postpone some of the building. Sir Charles Campbell yesterday referred to one of those projects which I think lead to the dispersion of our expenditure; he wanted a canal through Scotland at a cost exceeding ten million pounds. I want battle-ships and cruisers, which are vital; I do not think the canal is of vital necessity. It may be useful, but I do not think it is vital, and I strongly deprecate the demand being raised at the present moment, when we have a predominance of Scotch Ministers in the Cabinet. We have from the Prime Minister downwards, with Lord Rosebery attacking on the flanks, Scotsmen all! Captain Crutchley rather took me to task about teaching history in the schools. I entirely agree that the Navy League is doing a most admirable work as regards history in schools, but what is that amongst 44 millions of people? What I was referring to was that there is no effort whatever on the part of the Government of the country to teach history in the schools. The efforts of the Navy League, admirable as they are as an example to all others, are a mere drop in the ocean compared to what is needed in order to educate the vast army of voters who will run us 10 years hence. Mr. Beauchamp referred to the "Invincibles," and said what we all say—and Sir William White said the same thing—that we never know what to call them. What we object to is the confidence trick: counting ships at one and the same time as battle-ships and as cruisers. Either they are battle-ships or they are cruisers. The same thing occurred in the old days. They were too clever by half. They built 50-gun ships which they said were battle-ships and frigates, and they never were a success. I think that example in history should be remembered. We are doing exactly the same confidence trick with the destroyers. We have these coastal destroyers half the tonnage and utterly inferior in armament to the destroyers the Germans are building, and though not fit to operate on the enemy's coast, they are reckoned as destroyers! The Germans are going right ahead of us with their programme of 12 destroyers a year. With reference to Mr. Beauchamp's important point about skeleton and nucleus crews, it emphasises our difficulty in the House of Commons. We cannot get any information of any sort out of the Admiralty, and therefore cannot have discussion. The House is asked blindly to trust the experts. I do not think that is right. We are quite entitled to know what the skeleton crews are, and what the nucleus crews are. You can call two men and a boy a skeleton crew. Perhaps the Admiralty are going to do the right thing and have large crews, but I do not believe they are. My own view about the two-Power standard is that one of the best means of attaining it would be for the First Lord's statement every year to include the names of the foreign battle-ships which were taken into consideration by the Board at the time the Estimates were framed. Then, if an additional battle-ship is laid down by one of the two principal foreign Powers, it ought to be an understood thing that we should lay down an additional battle-ship to meet her. Sir William White dealt with the programmes of the foreign Powers, and referred to the fact that of the French battle-ships, only two would be ready by 1910 and four by 1911. That was the very point I took into consideration in my paper. I said it was not necessary, owing to the slowness of building in France, to take those battle-ships into consideration until 1908-9 programme, which would be completed under favourable circumstances in 1910-11. But I showed that we should have a programme of three this year, seven the next, and nine or ten the year after, and I carried the meeting with me when I said that that was a very uneconomical way of proceeding, that it was far better to have five

armoured ships a year than ten battle-ships in the future. There is only one thing more that I desire to refer to. Sir William White, to a certain extent, proved that in the naval view unarmoured ends were right when they were first brought in. That may be so, but invention went along, and we got the Harveyised armour, by which you can defend twice the area with the same weight of armour, and I doubt whether unarmoured ends were right after that. At any rate, foreign Powers continued to build complete belted ships, and said they could sink our ships with their secondary armaments, whereas we went on with the unarmoured ends. Sir William White undoubtedly, in the ships that he designed, brought the Navy to a very high pitch of efficiency, so that we carried through the Fashoda crisis with an expenditure of only £13,000 extra; but it is perfectly certain that those ships that stood us in such good stead at the time of the Fashoda crisis, with the modern developments of gunnery and such marvellous shooting as the "Drake" made—75 per cent. of hits at 4 miles' range—those ships with unarmoured ends would not possibly avail in battle to-day.

The CHAIRMAN (Admiral Sir R. H. Harris, K.C.B., K.C.M.G.):—I think you will all join with me in agreeing that this has been a most valuable lecture, and that the Institution is to be congratulated on having the presence of so many Members of Parliament. It certainly is a great thing for us and a great thing for the Navy that naval matters should be thoroughly well understood by those people who represent the country in Parliament, and who have the whole power of finance in their hands. It is money which gives us a big Navy, and unless the Members are prepared to vote, and the constituents approve of their vote, the money is not forthcoming. Modern wars must be short, sharp, and decisive. There is no nation in Europe capable of carrying out a war with a neighbour for more than eighteen months or two years; they would be by that time financially broken. Much more likely is it that in the next naval war one nation or the other will be brought to its knees within the first week or ten days. Therefore I say, in reckoning up our naval strength, that naval strength should have a sufficiently large margin to replace those casualties that might happen accidentally or through the better strategy of the enemy—casualties that may make a fleet in the first week possibly inferior to its opponent. We have an instance of this in the Russo-Japanese war. I imagine that when a war between ourselves and any Continental Power, say Denmark, for instance, took place (I say Denmark because I do not wish to name the Power I have in mind), their destroyers, which are the equal of our own destroyers, would first attack our battle-ships, and I think our force of destroyers is not up to the standard strength to that it should be kept at to prevent such an attack. Time does not permit me to say much more, but I wish to mention the increased size of battle-ships. As we increase the size of battle-ships we have to build nearly two to the one of other Powers, and therefore the expense is very much greater. One "Dreadnought" is supposed to equal four older class vessels, but the risk to one of these ships of being destroyed or disabled by a Whitehead torpedo or a submarine mine is just as great as the risk of the smaller ships, while in the event of a "Dreadnought" being destroyed, it is equal to wiping out four battle-ships instead of one. All this has to be taken into consideration in measuring naval strength. Returning to what I said at the beginning of my remarks, I maintain that every ship should be kept in an absolute state of fighting efficiency. That

Programme of Battleships

1910

German Programme since 1898 = 2 Battleships a year.

Programme of Armoured & other Cruisers.

Programme of Destroyers

is a greater safeguard than relative numerical naval strength; but can we say that a ship with a nucleus or skeleton crew, with her complement newly completed and turned out to sea to fight a battle, is in a state of absolute sea-going fighting efficiency? She may be so on paper, but I do not think she will be found so in practice. I thank the lecturer in our names for his very valuable paper, and congratulate him on the excellent discussion that has followed it—a discussion which I think is almost unique in this Institution.